Report on Federal Awards in Accordance with OMB Uniform Guidance June 30, 2019 Employer Identification Number 13-5598093

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#### **Report of Independent Auditors**

To The Trustees of Columbia University in the City of New York

We have audited the accompanying consolidated financial statements of The Trustees of Columbia University in the City of New York and its subsidiaries (the "University"), which comprise the consolidated statements of financial position as of June 30, 2019 and 2018 and the related consolidated statements of activities for the year ended June 30, 2019 and of cash flows for the years ended June 30, 2019 and 2018.

#### Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

#### Auditors' Responsibility

Our responsibility is to express an opinion on the consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the University's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

#### Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of The Trustees of Columbia University in the City of New York as of June 30, 2019 and 2018, and the changes in their net assets for the year ended June 30, 2019 and their cash flows for the years ended June 30, 2019 and 2018 in accordance with accounting principles generally accepted in the United States of America.

#### **Emphasis of Matter**

As discussed in Note 2 to the consolidated financial statements, the University changed the manner in which it accounts for net assets and reports certain aspects of its financial statements as a not-for-profit entity, and the manner in which it accounts for net periodic benefit cost in 2019. Our opinion is not modified with respect to this matter.

#### Other Matters

Other Matter

We previously audited the consolidated statement of financial position as of June 30, 2018, and the related



consolidated statements of activities and of cash flows for the year then ended (not presented herein), and in our report dated October 9, 2018, we expressed an unmodified opinion on those consolidated financial statements. In our opinion, the information set forth in the accompanying summarized financial information as of June 30, 2018 and for the year then ended is consistent, in all material respects, with the audited consolidated financial statements from which it has been derived.

#### Other Information

Our audit was conducted for the purpose of forming an opinion on the consolidated financial statements as a whole. The accompanying schedule of expenditures of federal awards is presented for purposes of additional analysis as required by Title 2 U.S. Code of Federal Regulations Part 200, Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance) and is not a required part of the consolidated financial statements. The information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the consolidated financial statements. The information has been subjected to the auditing procedures applied in the audit of the consolidated financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the consolidated financial statements or to the consolidated financial statements themselves, and other additional procedures, in accordance with auditing standards generally accepted in the United States of America. In our opinion, the schedule of expenditures of federal awards is fairly stated, in all material respects, in relation to the consolidated financial statements taken as a whole.

#### Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated October 8, 2019 on our consideration of The Trustees of Columbia University in the City of New York's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements and other matters. The purpose of that report is solely to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing and not to provide an opinion on the effectiveness of internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering The Trustees of Columbia University in the City of New York's internal control over financial reporting and compliance

October 8, 2019

New York, New York

Pricewoterhouse Coopers LAP

## The Trustees of Columbia University in the City of New York Consolidated Statements of Financial Position

At June 30, 2019 and 2018

(in thousands of dollars)

	June 2019	June 2018
Assets		
Cash and cash equivalents	\$814,040	\$1,006,998
Accounts receivable, net	569,328	563,214
Receivable for securities sold	60,694	112,837
Cash and securities held in trust by others	36,457	112,071
Pledges receivable, net	664,840	727,213
Investments, at fair value	11,562,591	11,194,432
Institutional real estate	897,719	888,559
Land, buildings, and equipment, net	4,714,266	4,475,642
Other assets	655,944	633,969
Total assets	\$19,975,879	\$19,714,935
Liabilities		
Accounts payable and accrued expenses	\$373,647	\$329,030
Liabilities for securities purchased	4,536	26,010
Deferred revenue and other prepayments	289,643	274,599
Capital lease obligations	126,127	121,283
Conditional asset retirement obligations	118,930	119,249
Accrued employee benefit liabilities	379,651	342,731
Federal student loan funds	79,862	78,720
Bonds and notes payable (including bond premium and issuance costs of \$227,079 and \$250,334) (see Note 16)	2,000,200	2,084,285
Other long-term liabilities	576,056	543,684
Total liabilities	3,948,652	3,919,591
Net assets		
Without donor restrictions	7,307,924	7,192,615
With donor restrictions	8,719,303	8,602,729
Total net assets	16,027,227	15,795,344
Total liabilities and net assets	\$19,975,879	\$19,714,935

See accompanying notes to the consolidated financial statements.

#### The Trustees of Columbia University in the City of New York Consolidated Statements of Activities For the Year Ended June 30, 2019, with Summarized Comparative 2018 Totals (in thousands of dollars)

,	Without Donor Restrictions	With Donor Restrictions	June 2019	June 2018
Operating activities				
Revenues and support				
Tuition and fees (net of \$461,636 and \$433,173				
in financial aid grants, respectively)	\$ 1,201,922		\$ 1,201,922	\$ 1,149,377
Government grants and contracts:				
Direct	715,213		715,213	701,731
Indirect	242,234		242,234	230,733
Private gifts, grants and contracts:				
Direct	232,753	213,009	445,762	620,568
Indirect	32,464		32,464	30,213
Revenue from other educational and				
research activities	239,926		239,926	228,803
Patient care revenue	1,300,863		1,300,863	1,235,032
Investment income and gains utilized	451,160	219,878	671,038	621,254
Sales and services of auxiliary enterprises	191,086		191,086	183,651
Net assets released from restrictions	363,246	(363,246)		
Total operating revenues and support	4,970,867	69,641	5,040,508	5,001,362
Evnongog				
Expenses Instruction and educational administration	1,971,252		1,971,252	1,874,242
Research	639,873		639,873	
	· · · · · · · · · · · · · · · · · · ·			603,648
Patient care expense	1,099,268		1,099,268	1,025,611
Operation and maintenance of plant	284,831		284,831	269,529
Institutional support	312,613		312,613	307,127
Auxiliary enterprises	166,217		166,217	157,564
Depreciation	289,998		289,998	278,897
Interest	53,507		53,507	54,878
Total expenses	4,817,559		4,817,559	4,571,496
Change in net assets from operating activities	153,308	69,641	222,949	429,866
Nonoperating activities				
Endowment gifts		\$ 195,766	195,766	331,954
Current year realized and unrealized capital		Ψ 175,766	175,700	331,754
gains (losses)	132,718	225,177	357,895	809,963
Endowment appreciation utilized	(198,292)	(379,796)	(578,088)	(549,350)
Change in net assets held by CPMC Fund, Inc.	(1)	(19,771)	(19,772)	(130)
Change in funds held by others in perpetuity	(1)	2,040	2,040	18,703
Present value adjustment to split-interest agreements	854	8,382	9,236	(7,088)
Net periodic benefit cost other than service cost	8,532	0,302	8,532	4,183
Changes in pension and post retirement obligations	15,467		15,467	21,852
Other	(442)	18,300	17,858	(3,151)
Reclassification	3,165	(3,165)	17,030	(3,131)
Reclassification	3,103	(3,103)		
Change in net assets from nonoperating activities	(37,999)	46,933	8,934	626,936
Change in net assets	115,309	116,574	231,883	1,056,802
Net assets at beginning of year	7,192,615	8,602,729	15,795,344	14,738,542
Net assets at end of year	\$7,307,924	\$8,719,303	\$16,027,227	\$15,795,344
recasses at end of year	Ψ1,501,324	Ψ0,117,303	φ <b>10,02</b> 1,221	φ±0,170,044

See accompanying notes to the consolidated financial statements.

#### The Trustees of Columbia University in the City of New York Consolidated Statements of Cash Flows For the Years Ended June 30, 2019 and 2018 (in thousands of dollars)

	June 2019	June 2018
Cash flows from operating activities		
(Includes adjustments to reconcile change in net assets to net cash provided by operating activities	es):	
Change in net assets	\$231,883	\$1,056,802
Depreciation expense	289,998	278,897
Interest on capital lease obligations and CARO	11,782	11,640
Institutional real estate depreciation	30,379	28,919
Realized and unrealized (gains) losses	(357,895)	(809,963)
Partnership distributions	487,020	506,183
Contributions restricted for permanent investment,	,	,
plant, and split-interest agreements	(298,232)	(496,606)
Contributions other than cash	(1,422)	(3,461)
Present value adjustments and		
actuarial liability for split-interest agreements	(9,236)	7,088
Accreted interest on bonds	520	551
Change in unamortized bond premium and issuance costs	(23,256)	51,210
Change in fair value of net assets held by CPMC Fund, Inc.	19,772	130
Change in fair value of interest in perpetual trusts held by others	(2,040)	(18,703)
Change in operating assets and liabilities:	. , ,	` ' '
Accounts receivable, net	(6,114)	20,305
Pledges receivable, net	62,373	121,474
Other assets	(46,793)	(8,632)
Accounts payable and accrued expenses	(1,338)	24,906
Deferred revenue and other prepayments	15,044	15,534
Accrued employee benefit liabilities	36,920	16,988
CARO and other long-term liabilities	10,547	11,833
Net cash provided by operating activities	449,912	815,095
Net cash provided by operating activities	449,912	013,073
Cash flows from investing activities		
Proceeds from sales of investments	3,098,952	2,405,773
Purchases of investments	(3,543,285)	(3,420,997)
Collections from student notes	13,268	15,295
Student notes issued	(2,526)	(9,757)
Proceeds from / (Investment in) cash and securities held in trust by others	75,614	(25,021)
Purchases of institutional real estate	(37,568)	(24,307)
Purchases of plant and equipment	(473,233)	(450,597)
Net cash used by investing activities	(868,778)	(1,509,611)
Cash flows from financing activities		
Proceeds from contributions for:		
Investment in endowment	243,158	418,164
Investment in plant	50,672	51,990
Investment in split-interest agreements	4,402	26,452
Investment income on split-interest agreements	3,753	3,377
Payments on split-interest agreements	(5,550)	(5,347)
Payments on capital lease obligations	(10,320)	(9,819)
Repayment of bonds and notes payable	(61,349)	(248,584)
Proceeds from bond issuance	(- , /	325,185
	1,142	(5,470)
Net change in federal student loan funds	-,	555,948
Net change in federal student loan funds  Net cash provided by financing activities	225,908	
Net cash provided by financing activities	,	
Net cash provided by financing activities  Net change in cash and cash equivalents	225,908 (192,958) 1,006,998	
Net cash provided by financing activities	(192,958)	(138,568)
Net cash provided by financing activities  Net change in cash and cash equivalents Cash and cash equivalents at beginning of year  Cash and cash equivalents at end of year	(192,958) 1,006,998	(138,568) 1,145,566
Net cash provided by financing activities  Net change in cash and cash equivalents  Cash and cash equivalents at beginning of year	(192,958) 1,006,998	(138,568) 1,145,566

See accompanying notes to the consolidated financial statements.

#### The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### 1. Organization

The Trustees of Columbia University in the City of New York (the "University") is a private, nonsectarian, nonprofit institution of higher education whose activities are concentrated at two locations in New York City and extend around the globe. The University provides instruction through sixteen undergraduate, graduate, and professional schools. It operates a variety of research institutes and a library system to support its teaching, learning, and research activities. The University performs research, training, and other services under grants and contracts with agencies of the federal government and other sponsoring organizations. The University enrolls approximately 33,032 full-time and part-time students and employs approximately 17,775 full-time employees, including 6,372 full-time faculty members and research staff. Of these, 1,579 hold positions in the arts and sciences, 3,657 hold health science positions, and the remainder hold positions in the other professional schools.

The University is a New York nonprofit corporation recognized as tax exempt under Section 501(c)(3) of the Internal Revenue Code.

#### **Columbia University Irving Medical Center**

Columbia University Irving Medical Center ("CUIMC"), a division of the University, located in the Washington Heights section of northern Manhattan, is one of the largest academic medical centers in the United States. It is composed of four schools: Vagelos College of Physicians and Surgeons, Mailman School of Public Health, College of Dental Medicine, and School of Nursing.

CUIMC has three primary areas of focus: patient care, scientific research, and education. CUIMC offers a wide variety of degrees, certifications, and continuing education in health sciences. Faculty patient care services, sponsored research, tuition, endowment income, patent royalties, and gifts provide the majority of CUIMC's revenues. Approximately 4,337 students are enrolled at CUIMC with a full-time faculty of 2,535 of whom approximately 323 are tenured. Additionally, CUIMC's staff includes 2,607 part-time faculty instructors, 1,223 full-time and 259 part-time researchers, 201 post-doctoral research trainees, and 1,370 post-doctoral clinical trainees. Approximately 67 percent of the full-time faculty and 23 percent of the part-time faculty hold clinical appointments and have admitting privileges at New York-Presbyterian ("NYP")/CUIMC Campus.

Patient care activities include patient visits performed by Columbia faculty through its medical faculty practice plan, as well as clinical, educational and administration services provided to hospitals and other health care institutions through contractual agreements for services.

CUIMC maintains several clinical and education affiliation agreements with other organizations. The most significant affiliation agreements are with NYP, Lawrence Hospital, and Harlem Hospital. Certain faculty physicians also provide patient care and supervision of residents at NYP network hospitals and other affiliates. In addition, through interinstitutional professional service agreements and medical service agreements, CUIMC faculty provide patient care in specialty and subspecialty areas at hospitals in the tristate area and occasionally in other parts of the country and the world.

**Notes to the Consolidated Financial Statements** 

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

During the year ended June 30, 2019, the clinical faculty handled approximately 2.3 million outpatient and emergency room visits and participated in instruction and supervision of 647 University medical students and 965 residents and fellows at NYP. CUIMC physicians generated approximately 63,000 NYP hospital admissions during the year.

Payments for patient care services provided by the full-time faculty in both institutional and private office settings are derived mainly from third-party payers, including managed care companies (55 percent), Medicare (17 percent), Medicaid (13 percent), commercial insurance (5 percent), and other (1 percent). Direct patient payments comprise 9 percent of total payments.

#### **Other Activities**

The University holds a number of limited liability companies, not-for-profit corporations and international organizations, which are established to facilitate various program and research objectives, and the results of which are included in the University's consolidated financial statements, including:

- Columbia Investment Management Company, LLC, a New York limited liability company
  formed by the University to manage the University's investment assets under the
  supervision of a Board appointed by the Trustees of the University and subject to the
  oversight of the Committee on Finance of the Trustees.
- Reid Hall Inc., located in Paris, France, which was donated to the University in 1964. Reid Hall, Inc., a corporation organized under New York membership corporation law as an educational and charitable organization, operates Reid Hall to promote, facilitate, and aid the educational, cultural, and social interests of students studying in France.
- Columbia University Healthcare, Inc., a not-for-profit practice entity in which the University is the sole corporate member.
- Columbia Doctors of New Jersey, P.C, Columbia Doctors of Bergen County, P.C. and Columbia Doctors of Connecticut, which are professional corporations in which the University is the sole corporate member.

The University also provides investment custodial services and manages all of the assets of Columbia Presbyterian Medical Center Fund, Inc. ("CPMC Fund, Inc."), a not-for-profit corporation that was created to hold and receive gifts for the University and NYP. The consolidated financial statements reflect the University's interest in the net assets of CPMC Fund, Inc. as well as the assets and amounts due to NYP.

#### 2. Summary of Significant Accounting Policies

The significant accounting policies of the University are as follows:

#### **Basis of Consolidation**

The consolidated financial statements of the University include the accounts of all academic and administrative departments of the University.

All significant intercompany accounts have been eliminated in consolidation.

#### **Basis of Presentation**

The University maintains its accounts in accordance with the principles of fund accounting. Under this method of accounting, resources for various purposes are classified into funds that are

### The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

consistent with activities or objectives specified by donors. Separate accounts are maintained for each fund.

For reporting purposes, the University prepares its consolidated financial statements in accordance with accounting principles generally accepted in the United States of America ("GAAP"), including the provisions of Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 958 Not-for-Profit Entities that requires resources be classified for reporting purposes based on the existence or absence of donor-imposed restrictions. Accordingly, the University classifies fund balances as without donor restrictions or with donor restrictions.

The consolidated financial statements of the University have, in all material respects, been prepared on an accrual basis.

#### **Revenues and Expenses**

Revenues are reported as increases in net assets without donor restrictions unless the use of those assets is limited by donor-imposed restrictions. Expenses are reported as decreases in net assets without donor restrictions. Gains and losses on investments are reported as increases or decreases in net assets without donor restrictions, unless their use is restricted by explicit donor stipulation or by law.

#### **Revenue Recognition**

The University recognizes contributions in accordance with the revenue recognition provisions of ASC Topic 958-605, Not-for-Profit Entities. Revenue is considered a contribution if it is determined not to be an exchange transaction. Revenue related to exchange transactions is recognized under the provisions of the applicable ASC Topic, which is typically ASC Topic 606, Revenue from Contracts with Customers.

ASC Topic 606, Revenue from Contracts with Customers, requires performance of the following steps as part of the revenue recognition assessment:

- Step 1 Identify the contract(s) with a customer
- Step 2 Identify the performance obligation(s) in the contract
- Step 3 Determine the transaction price
- Step 4 Allocate the transaction price to the performance obligation(s) in the contract
- Step 5 Recognize revenue when the entity satisfies a performance obligation

Revenue recognition for the University's significant types of revenue is discussed below.

Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### Tuition, Fees, Room and Board, and Financial Aid

Tuition and fees revenue is derived from degree programs and executive and continuing education programs and room and board revenue is derived from the provision of room and board services to students. Tuition and fees are recorded net of scholarships and other discounts and waivers ("Financial aid grants") and displayed in the consolidated statements of activities in "Tuition and fees". Room and board revenues are included as part of "Sales and services of auxiliary enterprises", however the recognition process mirrors that for tuition and fees. Each of these items is supported by separate contracts entered into between the University and the individual student.

Tuition and fees and room and board revenues are recognized as operating revenue in the period in which the University satisfies its performance obligations to its students. A performance obligation is a promise in a contract to transfer a distinct good or service to the customer and is the unit of accounting in ASC Topic 606. The University's performance obligations are to provide education to the student and, in certain instances, other items such as room and board. The University recognizes tuition and fees and room and board on a straight-line basis over each academic session based on gross price, net of explicit price concessions such as financial aid grants which are applied to tuition and fees. The value that is recognized for each performance obligation is set forth in publicly available University price lists and is codified in the individual contracts with each student. Individual contracts for tuition and fees and room and board display the transaction price on a standalone basis for each service to be provided to each specific student. Additionally, the contract will contain the price adjustment in the form of financial aid grants that are being awarded to the student. Given the timing of each year's academic sessions, nearly all performance obligations on behalf of the University are completed within the fiscal year.

The timing(s) of billings, cash collections and revenue recognition results in accounts receivable and deferred revenue and student deposits on the consolidated statements of financial position. Receivables are recognized only to the extent that is it probable that the University will collect substantially all of the consideration to which it is entitled in exchange for goods and services transferred to the student. Receipts received in advance of goods and services performed are recorded as deferred revenue and student deposits.

#### Contributions and Pledges Receivable

Contributions for University operations and plant, including unconditional promises to give ("pledges"), are recognized as operating revenue in the period earned. Contributions to endowment are recognized as nonoperating revenue in the period earned. Amounts expected to be collected in future years are recorded at the present value of estimated future cash flows, net of an allowance for uncollectable pledges. The discounts on those pledges are computed using an interest rate for the year in which the promise was received and considers market and credit risk as applicable. Subsequent years' accretion of the discount is included in contribution revenue. Conditional promises to give are not recognized as revenue until such time as the conditions are met.

#### **Grant and Contract Income**

The University receives sponsored program grant and contract income from governmental and private sources. The funding may represent a nonreciprocal transaction in which the resources provided are for the benefit of the University, the funding organization's mission, or the public at large or it may be a reciprocal transaction in exchange for an equivalent benefit in return.

Revenues from exchange transactions are recognized as performance obligations are satisfied which in most cases mirrors the timing of when related costs are incurred. Revenues from non-

### The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

exchange transactions may be subject to conditions in the form of both a barrier to entitlement and a refund of amounts paid (or a release from obligation to make future payments). The University recognizes revenue earned from conditional non-exchange transactions when the barrier is satisfied, typically as related costs are incurred. At June 30, 2019, the University has grants or contracts for which it has not yet met all obligations to recognize revenue, or the right to recognize revenue is dependent on future events. These open commitments total \$2.7 billion and it is expected that revenue will be recognized as the University fulfills its obligations over several years. In addition, the University has elected the simultaneous release option for conditional contributions that are also subject to purpose restrictions. Under this option, net assets without donor restrictions will include the donor-restricted contributions if the purpose restrictions are met in the same reporting year as the revenue is recognized.

Indirect cost recoveries on federally sponsored programs, such as the recovery of facilities and administrative (F&A) costs, are at reimbursement rates negotiated with the University's cognizant agency, the Department of Health and Human Services. The University and the federal government operated under a provisional agreement that provided for F&A cost rates under federal grants and contracts through October 24, 2017. The provisional rates were based on the agreement that was in place through June 30, 2014. In the fall 2017, the University entered into a new agreement with the federal government which defines the rate at which the University can be reimbursed for F&A costs applicable to federal on-campus research effective July 1, 2018. This agreement will remain in place until such time a new agreement is reached.

#### Patient Care Revenue and Expense

Patient care activities relate to three distinct areas: medical faculty practice plans, affiliation agreements, and medical and professional service agreements.

Patient care expenses include direct expenses associated with providing patient care services, as well as administrative functions within the University's faculty practice organization. Patient care expense does not include rent or utilities in clinical space, as those costs are aggregated with all University space costs within "Operations and maintenance of plant".

The University provides medical care to patients via its ColumbiaDoctors faculty practice, primarily under agreements with third-party payers. The University determines performance obligations based on the nature of the services provided. Generally these performance obligations, regardless of whether the patient is receiving outpatient or inpatient services, are satisfied when the service is provided. The University bills third-party payers and patients after performance obligations are satisfied. For the limited number of patient service performance obligations that will be satisfied over a period of time, it is expected that these obligations will generally be completed soon after the end of the reporting period and the revenue related to the unsatisfied obligation will be deferred into the following fiscal year.

The University determines transaction price based on gross charges for services provided which are established on an annual basis and uniformly applied. The gross charges may be reduced by explicit price concessions, which include contractual adjustments based on agreements with third-party payers or implicit price concessions provided to uninsured patients. The University determines its estimate of implicit price concessions based on its historical collection experience with these classes of patients using a portfolio approach as a practical expedient to account for patients as a collective group rather than individually. The impact of using this practical expedient does not have a material effect on the financial statements.

Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

The University maintains several clinical and education affiliation agreements with other organizations, the largest of which is with NYP. Under these affiliation agreements, the University has a performance obligation to provide medical, professional, and supervisory staff as well as other technical assistance and clinical services. Additionally, the University operates clinical departments for specific purposes, including administration, supervision, and teaching of the NYP resident staff as well as clinical programs that the University and NYP would like to see developed or expanded. The transaction price for the provision of these services is the result of an annual negotiation between the University and the other parties to the affiliation agreements that takes the form of a joint budget agreement. All material services are performed by the University, based on the terms of the agreements, within the University's fiscal year and the related revenue is recognized accordingly in the financial statements. The revenues and expenses from these agreements are accounted for in patient care and education categories of the operating activity in the consolidated statements of activities.

#### Research and Development

The University engages in numerous research and development projects, which may be partially or fully sponsored by governmental and private funds. These costs are charged to operating expense as incurred. The University periodically funds and develops patents for certain technologies, then licenses the usage of these patents to companies for a specified period of time. The revenue, net of payments due to third parties, is recorded in "Revenue from other educational and research activities" in the consolidated statements of activities. Costs incurred with developing and maintaining these patents are expensed as incurred.

#### **Institutional Support**

Institutional support expense includes central administrative functions and expenses that support the management of the University. This category also includes any net operating surplus or deficit of the University's benefit pool, as recoveries from units across the University may be less than or greater than benefits paid in a given year.

#### **Cash and Cash Equivalents**

Cash and cash equivalents are recorded at fair value and include several depository accounts, checking accounts, institutional money market funds, and similar temporary investments with maturities of three months or less at the date of purchase.

#### **Investments**

The University's investments, consisting primarily of publicly traded fixed income and equity securities, alternative investments, and cash held for reinvestment, are stated at fair value as of June 30, 2019 and 2018. Alternative investments include investments in absolute return strategy funds, private equity funds, and real asset funds. The management of each respective fund provides the fair value of the investment. The University reflects its share of the partnerships or corporations in the consolidated financial statements.

Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The University believes that the net asset value of its alternative investments is a reasonable estimate of fair value as of June 30, 2019 and 2018. Because alternative investment funds are not marketable, the estimated value is subject to uncertainty and, therefore, may differ from the value that would have been used had a ready market for the investment existed. Such differences could be material. The amount of gain

Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

or loss associated with these investments is reflected in the consolidated financial statements based on the University's proportionate share in the net assets of these investments.

The University's presentation in the consolidated statements of cash flows for limited liability partnerships, limited liability corporations, and other similarly structured investments is consistent with the accounting for equity method investments as it represents the underlying nature of these investments in which the University has a capital account.

The University records purchases and sales of securities on a trade-date basis. Realized gains and losses are determined on the basis of average cost of securities sold and are reflected in the consolidated statements of activities. Dividend income is recorded on the ex-dividend date, and interest income is recorded on an accrual basis.

#### **Split-Interest Agreements**

The University's split-interest agreements with donors consist primarily of charitable gift annuities, pooled income funds, and irrevocable charitable remainder trusts for which the University serves as custodian and trustee. Assets are invested and payments are made to donors and/or other beneficiaries in accordance with the respective agreements. In the case of irrevocable split-interest agreements whose assets are held in trusts not administered by the University (third-party charitable trusts), the University will recognize its beneficial interest when it receives sufficient reliable information and documentation that establishes the trust's existence, the University's beneficial interest, and the value of that interest.

Contribution revenues for split-interest agreements are recognized at the dates the agreements are established net of the present value of the estimated future payments to be made to the beneficiaries, if applicable, under these agreements. The discounts on those agreements are computed using an interest rate for the year in which the contribution was received and considers market and credit risk as applicable. Assets related to these agreements are recorded in "Investments, at fair value" and the liability for the present value of the estimated future payments to be made to the beneficiaries is recorded in "Other long-term liabilities" in the consolidated statements of financial position. Adjustments to the fair value of these agreements are recorded in the consolidated statements of activities under "Present value adjustment to split-interest agreements".

#### **Institutional Real Estate**

Institutional real estate consists primarily of properties proximate to the University's Morningside and Washington Heights campuses, the primary purpose of which is to house faculty, staff, and graduate students. The income earned on this investment is used primarily to finance operating expenditures. The properties are valued at cost and depreciated over useful lives ranging from twelve and one half to fifty years.

#### Land, Buildings, and Equipment

Land, buildings, and equipment are stated at cost net of accumulated depreciation. Depreciation is calculated on a straight-line basis over useful lives ranging from ten to one hundred years for buildings and building improvements and two to twenty years for equipment, consistent with the method used for government cost reimbursement purposes. Capitalized software costs are amortized over seven years. Upon disposal of assets, the costs and accumulated depreciation are removed from the accounts, and the resulting gain or loss is included in nonoperating activities.

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#### **Collections**

Collections at the University include works of art, literary works, historical treasures, and artifacts that are maintained in the University's galleries, libraries, and buildings. These collections are protected and preserved for public exhibition, education, research, and the furtherance of public service and, therefore, are not recognized as assets on the consolidated statements of financial position.

#### **Interest in Perpetual Trusts Held by Others**

The University is the beneficiary of certain perpetual trusts administered by others. These trusts are recognized as contributions with donor restrictions when the University receives sufficient reliable information and documentation that establishes the trust's existence, the University's beneficial interest, and the value of that interest. The fair value of the interest in these perpetual trusts is based on the University's proportional share of the fair value of assets reported by the trust, and is recorded in "Other assets" in the accompanying consolidated statements of financial position. Adjustments to the fair value of the University's interest are reported as "Change in funds held by others in perpetuity" in nonoperating activity in the consolidated statements of activities.

#### **Capital Lease Obligations**

Capital lease obligations are recognized for equipment and space where substantially all of the risks of ownership have been transferred to the University. The obligations extend up to seven years for equipment and up to fifty years for space.

#### **Conditional Asset Retirement Obligations**

Conditional asset retirement obligations ("CARO") are recognized for remediation or disposal of asbestos, underground storage tanks, soil, and radioactive sources and equipment as required by law. The fair value of the liability for a conditional asset retirement obligation is recognized in the period in which it occurred, provided that it can be reasonably estimated.

#### **Other Long-Term Liabilities**

Other long-term liabilities are obligations that extend beyond one year, or operating cycle, whichever is longer. The obligations for medical malpractice liabilities, self-insurance reserves, the fixed payer interest rate swap agreement, split-interest agreement liabilities, and other commitments are categorized in other long-term liabilities.

#### **Use of Estimates**

The preparation of consolidated financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates. The most significant estimates include valuation of investments without readily determinable prices in active markets, estimated useful lives of buildings, building improvements, and equipment, actuarially determined costs associated with split-interest agreements, pension, postemployment and postretirement benefits, explicit and implicit price concessions for patient and other receivables, insurance obligations, and conditional asset retirement obligations.

#### **2018 Presentation**

While comparative information is not required under GAAP, the University believes that this information is useful and has included comparative financial information from the consolidated

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financial statements for 2018. Within the consolidated statements of activities, prior year presentation of net asset categorization has been condensed for comparative purposes. This summarized information is not intended to be a full presentation in conformity with GAAP, which would require certain additional information. Accordingly, such information should be read in conjunction with the University's audited consolidated financial statements for the year ended June 30, 2018. Certain prior year information has been reclassified to conform to current year presentation.

#### New Authoritative Pronouncements Adopted by the University

In May 2014, the FASB issued Accounting Standards Update ("ASU") No. 2014-09, Revenue from Contracts with Customers (Topic 606) and Other Assets and Deferred Costs - Contracts with Customers (Subtopic 340-40). This ASU implements a single framework for revenue recognition ensuring that revenue is recognized in a manner which reflects the consideration to which the entity expects to be entitled to in exchange for goods and services. The University adopted ASU 2014-09 in the current year. Adoption did not have a material impact on the University's consolidated financial statements and changes have been applied to the University's financial statements and footnotes on a full retrospective basis.

In August 2016, the FASB issued ASU 2016-14, Not for Profit Entities (Topic 958): Presentation of Financial Statements. The ASU amends the financial reporting requirements in Topic 958, Not-for-Profit Entities. The University adopted ASU-2016-14 in the current year and applied the changes retroactively. The ASU requires the University to reclassify its net assets from three into two categories: without donor restrictions and with donor restrictions. The guidance also requires that external and direct internal investments expenses be netted against investment returns, and also enhances disclosures about the composition of net assets, liquidity, and expenses by both functional and natural classification. Additionally, the University made certain elective modifications to its presentation in the consolidated financial statements, which involve the consolidation of selected line items with other line items of a similar nature. The University adopted ASU 2016-14 in the current year. Adoption did not have a material impact on the University's consolidated financial statements.

In March 2017, the FASB issued ASU 2017-07, Compensation Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost. The ASU requires the service cost component of net period benefit costs be presented as a part of employee benefit expense. The other components of net periodic benefit cost, including interest, gains or losses, and amortization of other actuarially determined amounts are required to be presented as a nonoperating change in net assets without donor restrictions. The University adopted ASU 2017-07 in the current year and applied it retroactively. Adoption required the University to reclassify non-service related costs in its consolidated statements of activities from operating expenses within "Institutional support" to a separate non-operating line, "Net periodic benefit cost other than service cost". Adoption did not have a material impact on the University's consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-08, Not-for-Profit Entities (Topic 958), Clarifying the Scope and the Accounting Guidance for Contributions Received and Contributions Made. The ASU provides additional guidance for evaluating whether transactions should be accounted for as contributions (nonreciprocal transactions) or as exchange (reciprocal) transactions subject to other guidance, and for determining whether a contribution is conditional or unconditional. The

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University adopted ASU 2018-08 in the current year. Adoption did not have a material impact on the University's consolidated financial statements.

#### New Authoritative Pronouncements Not Yet Adopted by the University

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842). The new ASU establishes a right-of-use ("ROU") model that requires a lessee to record a ROU asset and a lease liability on the statement of financial position for all leases with terms longer than 12 months. This ASU is effective for fiscal years beginning after December 15, 2018 with early adoption permissible. Adoption is expected to result in the recognition of a ROU asset and related liability on the accompanying consolidated statements of financial position, which the University is currently in the process of quantifying.

In August 2016, the FASB issued ASU 2016-15, Classification of Certain Cash Receipts and Cash Payments. The ASU amends the financial reporting requirements in Topic 230, Statement of Cash Flows. Changes include revisions to the presentation of cash flows related to the settlement of debt instruments with coupon rates that are insignificant in relation to the effective interest rate of the borrowing and distributions received from equity method investees. This ASU is effective for fiscal years beginning after December 15, 2018 with early adoption permissible. The University is evaluating the impact of the new standard on the University consolidated financial statements.

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement: Disclosure Framework – Changes to the Disclosure Requirements for Fair Value Measurement (Topic 820). This ASU is effective for fiscal years beginning after December 15, 2019, with early adoption permissible. This ASU removes certain disclosures, modifies certain disclosures and adds additional disclosures related to fair value measurement. The University is evaluating the impact of the new standard on the University consolidated financial statements.

In March 2019, the FASB issued ASU 2019-03, Updating the Definitions of Collections, Not-for-Profit Entities (Topic 958). This ASU is effective for fiscal years beginning after December 15, 2019, with early adoption permissible. This ASU modifies the term "Collections", which in turn may change collection recognition policies, and also adds certain disclosure requirements. The University is evaluating the impact of the new standard on the University consolidated financial statements.

#### 3. Net Assets

The University classifies its net assets as without donor restrictions or with donor restrictions. Periodically, donor redesignations may result in reclassifications of net assets. Descriptions of the two net asset categories and the types of transactions affecting each category follow.

Without Donor Restrictions—Net assets that are not subject to explicit donor-imposed restrictions. This category includes funds designated by the Board of Trustees to function as endowment and other undesignated funds such as tuition and other current funds, gifts without restrictions (including gifts whose donor-imposed restrictions were met during the fiscal year), net investment in plant, and student loan funds.

With Donor Restrictions—Net assets that are subject to explicit donor-imposed stipulations. This includes net assets with donor restrictions that will be satisfied by actions of the University, the passage of time, or both. These net assets include gifts for which the donor-imposed restriction(s)

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have not been met in the year of receipt (including gifts for capital projects not yet placed in service), pledges, split-interest agreements, and net assets from donor-restricted endowments not yet appropriated for spending. Once the restrictions are satisfied, or have been deemed to have been satisfied, net assets with donor restrictions are reclassified to net assets without donor restrictions.

Also included in this category are net assets with donor restrictions that require these to be maintained permanently by the University and invested to provide a perpetual source of income. Net assets with donor restrictions that are permanent include (a) the original value of gifts donated to the permanent endowment, (b) the original value of subsequent gifts to the permanent endowment endowment, and (c) realized and unrealized gains and losses to the permanent endowment when stipulated by the donor gift instrument.

The composition of the University's net assets as of June 30 are as follows:

	2019		 2018
With Donor Restrictions			
Endowment funds	\$	7,422,159	\$ 7,321,704
Unexpended capital and other (a)		523,690	453,137
Pledges receivable		664,840	727,213
Annuity and life income funds		108,614	 100,675
Total, Net Assets With Donor Restrictions		8,719,303	 8,602,729
Without Donor Restrictions			
Board designated endowment funds		3,528,579	3,547,541
Undesignated		3,779,345	 3,645,074
Total, Net Assets Without Donor Restrictions		7,307,924	 7,192,615
Total Net Assets	\$	16,027,227	\$ 15,795,344

<sup>&</sup>lt;sup>(a)</sup> Includes capital gifts not yet released from restriction, unspent gift and endowment income balances, and student loan funds.

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#### 4. Operating Measurement

The University divides its consolidated statements of activities into operating and nonoperating activities. The operating activities of the University include all income and expenses related to carrying out its educational and research mission. Operating revenues include investment income and endowment appreciation utilized to fund current operations, the largest portion of which is the distribution of funds budgeted in accordance with the endowment spending rule.

Nonoperating activities include current year realized and unrealized gains and losses on investments, including realized gain distributions from fund investments, less amounts withdrawn from endowment appreciation to fund operations. Nonoperating activities also include new gifts to donor-restricted endowments that the University must hold in perpetuity, changes in net assets held by CPMC Fund, Inc., changes in funds held by others in perpetuity, present value adjustments to split-interest agreements, net periodic benefit cost other than service cost, changes in pension and postretirement obligations other items, and reclassifications.

#### 5. Patient Care Revenue

The University's affiliation agreements with area hospitals generated \$380.7 million and \$349.7 million of revenue for the years ended June 30, 2019 and 2018, respectively. As of June 30, 2019 and 2018, "Accounts receivable, net" includes \$111.6 million and \$91.4 million, respectively, relating to these agreements.

Medical faculty practice revenue is reported at the estimated net realizable amounts from patients, third-party payers, and others for services rendered. Medical faculty practice revenues are \$822.4 million and \$795.6 million for the years ended June 30, 2019 and 2018, respectively. As of June 30, 2019 and 2018, patient accounts receivable amounts to \$123.0 million and \$111.6 million, respectively. Medical service agreements generated \$30.0 million and \$25.5 million of revenue for the years ended June 30, 2019 and 2018, respectively, and other patient care activities generated \$67.1 million and \$64.2 million of revenue for the years ended June 30, 2019 and 2018, respectively.

#### 6. Long-Term Investments and Fair Value

The University values its investments in accordance with GAAP and consistent with the FASB official pronouncement on *Fair Value Measurements* for financial assets and liabilities. The pronouncement defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. GAAP establishes a hierarchy of valuation inputs based on the extent to which the inputs are observable in the marketplace. Observable inputs reflect market data obtained from sources independent of the reporting entity. Unobservable inputs reflect the entity's own assumptions about how market participants would value an asset or liability based on the best information available. Valuation techniques used to measure fair value utilize relevant observable inputs and minimize the use of unobservable inputs.

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The University follows a fair value hierarchy based on three levels of inputs, described below:

Fair value for Level 1 is based on quoted prices in active markets that the University has the ability to access for identical assets and liabilities. Market price data is generally obtained from exchange or dealer markets. The University does not adjust the quoted price for such assets and liabilities.

Fair value for Level 2 is based on quoted prices for similar instruments in active markets, quoted prices for identical or similar instruments in markets that are not active, or inputs other than quoted prices that are observable.

Fair value for Level 3 is based on valuation techniques that use significant inputs that are unobservable as they are not actively traded.

A financial instrument's categorization within the valuation hierarchy is based upon the lowest level of input that is significant to the fair value measurement. In determining the categorization of the University's investments within the fair value hierarchy, the University has considered market information including observable net asset values and the length of time until the investment will become redeemable. Investments for which fair value is measured using net asset values (NAV) as a practical expedient are excluded from the hierarchy and have been reported separately within the table below. The categorization of a financial instrument within the hierarchy is based upon the pricing transparency of that instrument and does not necessarily correspond to the University's perceived risk of that instrument.

From time to time, the University may hold direct real estate investments. These investments are categorized as Level 3 within the fair value hierarchy. Valuation for material directly held real estate investments is determined from periodic valuations prepared by independent appraisers or broker opinions.

The University holds certain investments for which fair value is determined by using the unadjusted net asset value per share (NAV) as provided by the fund management as a practical expedient. Investments categorized as NAV include the University's ownership in funds that invest in alternative assets (i.e. absolute return strategy funds, private equity funds, and real asset funds) and funds that invest in equity and fixed income strategies for which observable net asset values are not available. The value of the University's investments in these funds represents the University's ownership interest in the net asset value of the respective fund. Items classified as NAV do not have a quoted price in an active market place. As a practical expedient, the University is permitted under GAAP to estimate the fair value of an investment at the measurement date using the NAV reported by the fund manager without further adjustment, provided the NAV has been calculated in accordance with or in a manner consistent with GAAP, and provided further that the University does not expect to sell the investment at a value other than NAV. The University has various processes and controls in place to ensure investment fair value is reasonable and performs various due diligence procedures of its investments including an assessment of applicable accounting policies, a review of the valuation procedures employed, and consideration of redemption features and price transparency.

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The following tables present assets and liabilities measured at fair value and NAV at June 30, 2019 and June 30, 2018.

and June 30, 2016.						2019					
Assets		Level 1		Level 2		Level 3	N	AV		To	otal
Investments:											
Cash and cash equivalents	\$	691,257	\$	340,676					\$	1	,031,933
Global equities	į	1,086,958		78,814	\$	1,040	\$ 1,1	174,241		2	,341,053
Fixed income		1,612		710		4	3	322,184			324,510
Absolute return strategies		30,275		6,134			3,6	521,495		3	,657,904
Private equity		72,080		-		112,021	2,0	)56,544		2	,240,645
Real assets		2,811		(983)		30,300	1,9	934,418		1	,966,546
Investments, at fair value		1,884,993		425,351		143,365	9,1	108,882		11	,562,591
Interest in perpetual trusts											
held by others						181,115		11,836			192,951
Total assets at fair value	\$ .	1,884,993	\$	425,351	\$	324,480	\$ 9,1	120,718	\$	11	,755,542
Liabilities											
Swaps payable	=		\$	76,072					\$		76,072
Total liabilities at fair value			\$	76,072					\$		76,072
						2018					
Assets	_	Level 1		Level 2		Level 3	NAV				Total
Investments:											
Cash and cash equivalents		\$ 554,0	73	\$ 328,23	31					\$	882,304
Global equities		1,400,1	43	81,78	88	\$ 1,520	3	876,4	62		2,359,913
Fixed income		3,2	03	1,07	78	1	1	287,343			291,635
Absolute return strategies		60,4	47	7,31	4			3,494,6	51		3,562,412
Private equity		1,3	40			86,05	5	1,972,3	57		2,059,752
Real assets		5,0		2,68		27,69	7	2,003,0	31		2,038,416
Investments, at fair value	_	2,024,2	10	421,09	95	115,283	3	8,633,8	44		11,194,432
Interest in perpetual trusts											
held by others	_					178,950		11,9			190,911
Total assets at fair value	_	\$ 2,024,2	10	\$ 421,09	95	\$ 294,239	9 \$	8,645,7	99	\$	11,385,343
Liabilities											
Swaps payable	_			\$ 57,10						\$	57,107
Total liabilities at fair value				\$ 57,10	)7					\$	57,107

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#### Cash and Cash Equivalents

Cash and cash equivalents include government securities and money market instruments and are valued at amortized cost, which approximates fair value.

#### **Global Equities and Fixed Income**

Global equities and fixed income consist of investments in publicly traded U.S. and foreign common and preferred equities, funds that invest in equity and fixed income based strategies, and cash held in separate accounts committed to these strategies. The fair value of these investments is based on quoted market prices. Investments that are listed on an exchange are valued, in general, at the last reported sale price (or, if there is no sales price, at the last reported bid price, or, in the absence of reported bid prices, at the mean between the last reported bid and asked prices thereof). Fund investments in equity and fixed income based strategies are valued in accordance with NAV provided by the investment managers of the underlying funds. If the University has valued the investment based on NAV as a practical expedient, the investment has been excluded from the fair value hierarchy and will be categorized as NAV. If the valuation does not meet the practical expedient criteria and the University has the ability to redeem from a fund up to 180 days beyond the measurement date, the investment is categorized as Level 2. If the redemption period extends beyond 180 days, the investment is categorized as Level 3.

#### **Alternative Investments**

Alternative investments include interests in absolute return strategy funds, private equity funds, and real asset funds. Private equity funds include large market, leveraged buyout, and venture capital based strategies. The University values these investments in accordance with valuations provided by the investment managers of the underlying funds. These funds may make investments in securities that are publicly traded, which are generally valued based on observable market prices, unless a restriction exists. In addition, interests in a private equity fund may be publicly traded and valued based on observable market prices.

As a general rule, managers of funds invested in alternative investments value those investments based upon the best information available for a given circumstance and may incorporate assumptions that are the investment manager's best estimates after consideration of a variety of internal and external factors. If no public market exists for the investments, the fair value is determined by the investment manager taking into consideration, among other things, the cost of the investment, prices of recent significant placements of similar investments of the same issuer, and subsequent developments concerning the companies to which the investments relate. The University's management may consider other factors in assessing the fair value of these investments. If the University has valued these alternative investments based on NAV as a practical expedient, the investment is excluded from the fair value hierarchy and will be categorized as NAV. For absolute return funds, if the valuation does not meet the practical expedient criteria and the University has the ability to redeem from an absolute return strategy fund up to 180 days beyond the measurement date, the investment is categorized as Level 2. If the redemption period extends beyond 180 days, the investment is categorized as Level 3. For private equity funds and real asset funds, if the valuation does not meet the practical expedient criteria, the investments are categorized as Level 3 given that the University does not have discretion for timing of withdrawal.

The fair value of the alternative investment funds in the table above represents the amount the University would expect to receive at June 30, 2019 and 2018, if it had liquidated its investments in the funds on these dates. The University has performed due diligence around these investments and believes that the NAV of its alternative investments is a reasonable estimate of fair value as of June

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30, 2019 and 2018. Alternative investments may allocate a high percentage of their assets in specific sectors of the market in order to achieve a potentially greater investment return. As a result, the investments may be susceptible to economic, political, and regulatory developments in a particular sector of the market, positive or negative, and may experience increased volatility in net asset values.

Absolute return strategies also include separate accounts with direct investments in fixed income (which include mortgage backed securities, collateralized mortgage obligations, and convertible bonds) and cash committed to these strategies. The fair value of these investments is based on the last reported bid price obtained from pricing sources or broker quotes and is categorized as Level 2.

#### **Perpetual Trusts**

The fair value of interest in perpetual trusts held by others is based on the University's share of the income generated by the trust, ascribed to the fair value of the assets reported by the trust.

#### **Derivatives**

Investment fund managers may invest in derivatives, and the value of these positions is reflected in the NAV of the respective funds. Separately, the University employs derivatives primarily to hedge its risks and to rebalance its market exposures. Derivatives used may include futures, swaps, options, and forward contracts and are reflected at fair value following the definition of Level 1 and Level 2 assets as described above. Certain derivative positions held within the endowment portfolio are subject to master netting agreements included within an International Swap and Derivatives Association, Inc. ("ISDA") master agreement with each of the counterparties.

The following positions are reflected on a net basis within "Investments, at fair value" on the consolidated statements of financial position and are summarized below.

	Notional	Exposure				S		Net	Collateral	
<b>Derivative Instruments</b>	Long	Short	Asset		Liability		Fa	ir Value	Posted	
June 30, 2019										
Equity Currency*	\$ 260,754	\$ 57,511	\$	33,713 6,006	\$	(413) (9,270)	\$	33,300 (3,264)	\$	7,869
June 30, 2018 Equity Currency*	\$ 284,922		\$	15,907 4,580	\$	(7,015) (28,034)	\$	8,892 (23,454)	\$	8,180

<sup>\*</sup>The University held currency derivative contracts with an aggregate notional amount of \$1,220.2 million and \$721.6 million as of June 30, 2019 and 2018, respectively.

Outside of the endowment portfolio, the University entered into a fixed payer interest rate swap as described in Note 16. The estimated fair value of the agreement were liabilities of \$76.1 million and \$57.1 million at June 30, 2019 and 2018, respectively, and is included in "Swaps payable" in tables on the preceding pages. The derivatives are reflected as a receivable or payable, as appropriate, on the consolidated statements of financial position. Unrealized gain or loss from derivative investments is a component of the current year realized and unrealized capital gains (losses) in the consolidated statements of activities.

The methods described above may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, while the University believes its

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valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different estimate of fair value at the reporting date.

The following tables roll forward the amounts reported in the consolidated statements of financial position for financial instruments classified by the University within Level 3 of the fair value hierarchy defined above at June 30, 2019 and 2018.

	_	June 30, 2018	Transfers In/Out		Purchases		Sales		Realized gain/loss		Unrealized gain/loss		June 30, 2019	
Global equities	\$	1,520	\$	(456)			\$	(413)			\$	389	\$	1,040
Fixed income		11			\$	1		(10)				2		4
Private equity		86,055		(1,741)		13,862		(3,714)	\$	178		17,381		112,021
Real assets		27,697				1,633				(20,080)		21,050		30,300
Total level 3 investments	\$	115,283	\$	(2,197)	\$	15,496	\$	(4,137)	\$	(19,902)	\$	38,822	\$	143,365

				Realized/ Unrealized	
	June 30, 2018	Transfers In/Out	Disburse ments	e- gain/loss, net	June 30, 2019
Interest in perpetual trusts held by others	\$ 178,956		\$ (7,49	96) \$ 9,655	\$ 181,115

	J	une 30, 2017	ransfers In/Out	Pı	urchases	Sales	Realized gain/loss	_	nrealized gain/loss	June 30, 2018
Global equities	\$	1,726		\$	3			\$	(209) \$	1,520
Fixed income		30			1	\$ (20)				11
Private equity		92,436			25,941	(27,364) S	15,21	3	(20,171)	86,055
Real assets		13,008	\$ (141)		12,281	(1,474)			4,023	27,697
Total level 3 investments	\$	107,200	\$ (141)	\$	38,226	\$ (28,858) 5	15,21	3 \$	(16,357) \$	115,283

						Realized/ Unrealized	
	_	June 30, 2017	ransfers In/Out			gain/loss, net	June 30, 2018
Interest in perpetual trusts held by others	\$	160,732	\$ (199)	\$	(7,101)	\$ 25,524	\$ 178,956

All net realized and unrealized gains (losses) in the tables above are reflected in the consolidated statements of activities. Net unrealized gains (losses) relate to those financial instruments held by the University at June 30, 2019 and 2018. The University's policy is to recognize transfers in and transfers out as of the end of the period. Transfers between Level 3 and Level 1, Level 3 and Level 2 as well as between Level 3 and NAV are reported at gross, due to the criteria described above. There were no significant transfers between Level 1 and Level 2 for the years ended June 30, 2019 and 2018.

Certain investments in global equities and alternative investments may be subject to restrictions that (i) limit the University's ability to withdraw capital after such investment and (ii) limit the amount that may be withdrawn as of a given redemption date. The redemption terms of the University's investments in absolute return strategy funds vary from daily to triennial, with a portion of these

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investments designated as "illiquid" in "sidepockets" and that portion may not be available for withdrawal until liquidated by the investing fund and redemption notice periods range from 0 days to 180 days. Generally, as noted above, the University has no discretion as to withdrawal of its investment in private equity and real asset funds; distributions are made when sales of assets are made within the funds. The remaining life of these private equity and real asset funds is up to 12 years.

The University is obligated under certain investment fund agreements to advance additional funding up to specified levels over a period of several years. These commitments have fixed expiration dates and other termination clauses. At June 30, 2019, the University had unfunded commitments of approximately \$2.3 billion as follows:

Asset class (\$ in millions)	Remaining life of fund	_	funded mitments	Timing to draw commitments
Global equities	N/A	\$	13	1 to 8 years
Absolute return strategies	N/A		148	1 to 5 years
Private equity	1 to 12 years		1,197	1 to 12 years
Real assets	1 to 12 years		979	1 to 12 years
Total		\$	2,337	

The University's estimate of the lives of the funds could vary significantly depending on the investment decisions of the external fund managers, changes in the University's portfolio, and other circumstances. Furthermore, the University's obligation to fund the commitments noted above may be waived by the fund manager for a variety of reasons including market conditions and/or changes in investment strategy.

The University has various sources of internal liquidity at its disposal, including cash, cash equivalents, marketable debt and equity securities, and lines of credit, which are available to fund the committed drawdowns.

#### **Investment Return**

Investment income and gains utilized on the consolidated statements of activities contains endowment appreciation utilized to fund the spending rule, institutional real estate revenue net of operating expenses and depreciation, and other investment income. Endowment appreciation utilized was \$578.1 million and \$549.4 million during 2019 and 2018, respectively. Current year realized and unrealized capital gains (losses) reported in nonoperating activities reflect investment returns net of external and direct internal investment costs, reduced by endowment appreciation utilized to fund the spending rule.

## The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018 (in thousands of dollars, unless otherwise noted)

#### 7. Endowment Funds

The University's endowment consists of approximately 5,800 separate funds established over many years for a wide variety of purposes, which include support of specific schools or departments of the University, professorships, research, faculty support, scholarships and fellowships, library, building construction, and other purposes. The endowment includes donor-restricted endowments and funds designated by the Board of Trustees to function as endowments. As required by GAAP, net assets associated with endowment funds, including funds designated by the Board of Trustees to function as endowments, are classified and reported based on the existence or absence of donor-imposed restrictions.

The University employs a market value unit method of accounting for pooled general investments. Each participating fund enters and withdraws from the pooled investment account based on monthly unit market values. Changes in the market value of investments are distributed proportionately to each fund that participates in the investment pool. Net investment income distributed during the year is allocated on a per unit basis to each participating fund.

#### **Relevant Law**

Under NYPMIFA, the University may appropriate so much of a donor-restricted endowment fund as it deems prudent, considering the specific factors set forth in NYPMIFA and subject to the intent of the donor as expressed in the gift instrument. Unless stated otherwise in the gift instrument, the earnings in an endowment fund are considered to have donor restrictions until appropriated.

The University continues to classify as net assets with donor restrictions (a) the original value of gifts donated to the permanent endowment, (b) the original value of subsequent gifts to the permanent endowment, and (c) accumulations to the endowment made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the fund. Accumulated appreciation on donor-restricted endowment funds is also included as net assets with donor restrictions until those amounts are appropriated for expenditure by the University in a manner consistent with the standard of prudence prescribed by NYPMIFA.

Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

Reconciliation to Investments, at fair value

The composition and changes in the University's endowment net assets as of June 30, 2019 and 2018, are as follows:

		2019			
			Total		
\$ 3,547,541	\$	7,321,704	\$	10,869,245	
171,717		246,699		418,416	
1,483		231,094		232,577	
(245,084)		(399,376)		(644,460)	
46,797		28,163		74,960	
 6,125		(6,125)			
52,922		22,038		74,960	
\$ 3,528,579	\$	7,422,159	\$	10,950,738	
	\$	3,397,438	\$	3,397,438	
		3,454,243		3,454,243	
\$ 1,414,680		362,378		1,777,058	
1,490,061				1,490,061	
623,838				623,838	
		15,149		15,149	
 		192,951		192,951	
\$ 3,528,579	\$	7,422,159	\$	10,950,738	
\$ \$	\$ 1,414,680 1,490,061 623,838	Restrictions       F         \$ 3,547,541       \$         171,717       1,483         (245,084)       46,797         6,125       52,922         \$ 3,528,579       \$         \$ 1,414,680       1,490,061         623,838       623,838	Without Donor Restrictions         With Donor Restrictions           \$ 3,547,541         \$ 7,321,704           171,717         246,699           1,483         231,094           (245,084)         (399,376)           46,797         28,163           6,125         (6,125)           52,922         22,038           \$ 3,528,579         \$ 7,422,159           \$ 3,397,438         3,454,243           \$ 1,414,680         362,378           1,490,061         623,838           15,149         192,951	Without Donor Restrictions         With Donor Restrictions           \$ 3,547,541         \$ 7,321,704         \$           171,717         246,699         \$           1,483         231,094         (399,376)           46,797         28,163         (6,125)           52,922         22,038         \$           \$ 3,528,579         \$ 7,422,159         \$           \$ 1,414,680         362,378         \$           1,490,061         623,838         15,149           192,951         1         192,951	

Note: The tables above do not include split-interest agreements, net of \$114,321 and pledges receivable, net of \$349,385.

Investments, at fair value		\$
Add:		
Interests in perpetual trusts held by others	192,951	

CPMC Fund, Inc. 15,149 Institutional real estate, net 623,838 Investment receivables and payables 905,613 73,675 Subtract: Other long-term investments (1,255,483)Split-interest agreements (175, 320)Funds held on behalf of others (86,663) (1,517,466)University's endowment value 10,950,738

11,562,591

#### **Notes to the Consolidated Financial Statements**

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

	2018									
Changes in University endowment net assets		Without Donor  Restrictions  Restrictions				Total				
Opening balance - June 30, 2017	\$	3,428,651	\$	6,567,945	\$	9,996,596				
Investment return		306,593		553,624		860,217				
New gifts		27,380		487,028		514,408				
Appropriation for expenditure		(267,625)		(359,985)		(627,610)				
Other changes:										
Transfers to create endowments		104,144		21,491		125,635				
Other / Reclassifications		(51,602)		51,601		(1)				
		52,542		73,092		125,634				
Closing balance - June 30, 2018	\$	3,547,541	\$	7,321,704	\$	10,869,245				
University endowment composition										
Donor-restricted endowment funds:										
Restricted in perpetuity	\$	-	\$	3,156,470	\$	3,156,470				
Appreciation				3,590,103		3,590,103				
Board designated endowment funds:										
Departmental funds		1,423,926		349,299		1,773,225				
University funds		1,524,762		-		1,524,762				
Institutional real estate, net		598,853		-		598,853				
CPMC Fund, Inc.		-		34,921		34,921				
Interests in perpetual trusts held by others		-		190,911		190,911				
University's endowment value	\$	3,547,541	\$	7,321,704	\$	10,869,245				

Note: The tables above do not include split-interest agreements, net of \$106,460 and pledges receivable, net of \$378,919.

Reconciliation to Investments, at fair value		
Investments, at fair value		\$ 11,194,432
Add:		
Interests in perpetual trusts held by others	190,911	
CPMC Fund, Inc.	34,921	
Institutional real estate, net	598,853	
Investment receivables and payables	118,279	942,964
Subtract:		
Other long-term investments	(1,000,797)	
Split-interest agreements	(169,177)	
Funds held on behalf of others	(98,177)	(1,268,151)
University's endowment value		\$ 10,869,245

**Notes to the Consolidated Financial Statements** 

For the Years Ended June 30, 2019 and 2018

#### **Return Objectives and Risk Parameters**

(in thousands of dollars, unless otherwise noted)

Endowment assets include those assets of donor-restricted funds that the University must hold in perpetuity or for a donor-specified period(s) as well as Board-designated funds. Under the University's investment policies, as approved by the Board of Trustees, the endowment assets are invested in a manner that is intended to produce performance which exceeds that of relevant indices for each asset class while assuming a moderate level of investment risk.

#### **Strategies Employed for Achieving Objectives**

The University relies on a total return strategy in which investment returns are achieved through both capital appreciation (realized and unrealized) and current yield (interest and dividends). The University targets a diversified asset allocation to achieve its long-term return objectives within prudent risk constraints.

#### **Endowment Spending Rule**

The endowment spending rule utilized by the University is designed to be directly responsive to both investment returns and the current level of price inflation. Its long-term objectives are:

- To protect the corpus of the endowment by spending no more than the real investment return;
- To cushion spending against market volatility; and
- To provide specific spending instructions and multiyear spending projections based on explicit future investment return assumptions.

The current endowment spending rule is based on two factors: first, the market value multiplied by a target spending rate that may range from 4.5 to 5.0 percent, which provides a response to investment market conditions; and second, the prior year's spending plus inflation, which ties spending increases to operating needs and cushions spending against market volatility. This allows the University to maintain the purchasing power of the endowment assets held in perpetuity or for a specified term as well as to provide additional real growth through new gifts and investment return.

As a general policy, each fiscal year's distribution is calculated by adding together the following:

- a. The market value of the endowment at a point twelve months prior to the beginning of the given fiscal year, multiplied by the target spending rate, multiplied by a 40 percent weighting; and
- b. Endowment spending in the year immediately preceding the given fiscal year, grown or reduced by an inflation factor, which is defined as the Higher Education Price Index ("HEPI"), multiplied by a 60 percent weighting.

The Trustees conduct a special review in any year in which either projected endowment distributions are 0.5 percent higher or lower than the target spending rate, or if the increase in endowment distributions over the previous year is more than 3 percentage points higher or lower than HEPI. Additionally, from time to time, management may recommend and the Trustees may approve a temporary override of the spending rule to ensure the University's ability to sustain the permanent nature of the endowment.

In addition to the base spending rate described above, an additional payout component was approved as a temporary measure by the Trustees in 2008. This component is 0.70 percent of the prior year beginning market value for certain endowments in categories key to the University's

Notes to the Consolidated Financial Statements

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

current development efforts, primarily endowments for purposes core to the University's educational and research mission, including financial aid and faculty support. This is reviewed by the Trustees regularly and has currently been extended through the end of fiscal year 2020.

Also, in 2008 the Trustees approved a temporary measure for an increase in annual spending of up to 1.75 percent of the prior year beginning market value of endowments that are designated for undergraduate financial aid support. This increase began in fiscal year 2009 and was phased out in fiscal year 2018, as new endowments substituted for this funding source.

#### **Underwater Endowment Funds**

From time to time, the fair value of assets associated with individual donor-restricted endowment funds may fall below the original gift value, which represents the total of the initial and subsequent donor contribution amounts. When this occurs, the deficit is classified as a reduction of donor-restricted net assets. Deficits existed in various donor-restricted endowment funds as of June 30, 2019 which combined had an original gift value of \$155.7 million and a current market value of \$154.2 million, resulting in a deficiency of \$1.5 million. These deficiencies resulted from market fluctuations that occurred after the investment of recent contributions and authorized appropriation from an endowment that was deemed prudent. No deficits existed at June 30, 2018.

#### 8. Accounts Receivable

Accounts receivable, net, consists of the following as of June 30:

	2019	2018
Patient receivables, net of explicit price concessions	\$ 196,819	\$ 171,926
Government agencies	105,457	134,573
NewYork-Presbyterian Hospital	129,849	107,131
Patent and licensing	7,359	9,379
Student receivables	74,065	68,174
Investment income receivable	6,177	5,384
Other receivables	150,666	152,215
	670,392	648,782
Less: Implicit price concessions	(101,064)	(85,568)
Accounts receivable, net	\$ 569,328	\$ 563,214

Patient receivables for medical services are net of explicit price concessions for contractual reserves in the amount of \$225.1 million and \$192.0 million at June 30, 2019 and 2018, respectively.

## The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018 (in thousands of dollars, unless otherwise noted)

#### 9. Student Loans Receivable and Financial Aid

The University participates in various federal loan programs, in addition to administering institutional loan programs. Loans receivable from students as of June 30 are as follows:

	 2019		2018	
Government revolving loans	\$ 56,043	\$	65,583	
Institutional loans	 29,521		31,225	
Gross student loans	85,564		96,808	
Less: Implicit price concessions	(2,177)		(2,679)	
Student loans receivable, net	\$ 83,387	\$	94,129	

Government revolving loans are funded principally with federal advances to the University under the Federal Perkins Loan Program and certain other programs. The Federal Perkins Loan Program expired on September 30, 2017 and no new disbursements were permitted after June 30, 2018, but there are outstanding balances from loans awarded in previous years. Balances under the Federal Perkins Loan Program totaled \$65.8 million and \$64.8 million and advances under the other federally sponsored loan programs are \$14.0 million and \$13.9 million as of June 30, 2019 and 2018, respectively. These advances are classified as liabilities on the consolidated statements of financial position. Interest earned on the revolving and institutional loan programs is reinvested to support additional loans. The repayment and interest rate terms of the institutional loans vary considerably.

Management regularly assesses the adequacy of implicit price concessions by performing ongoing evaluation of the student loan and student accounts receivable portfolios. Loans receivable under federally guaranteed student loan programs are subject to significant restrictions.

In addition to the loans identified above, the University processes and authorizes loans to students through the William D. Ford Federal Direct Loan Program. The amounts due under this loan program are not recorded in the University's consolidated financial statements since the University does not guarantee any federal loan funds related to this program. Loans issued under this program were \$291.1 million and \$306.1 million for the years ended June 30, 2019 and 2018, respectively.

Undergraduate financial aid represents grants and awards for all or part of a student's tuition and fees, and in certain other instances, items such as room and board. Graduate financial aid represents grants and awards for all or part of a student's tuition and fees. Funding from external sources is obtained through government and private grants and contracts as well as private gifts and payout from certain endowment funds.

#### **Notes to the Consolidated Financial Statements**

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

Financial aid granted to students is summarized as follows for the year ending June 30:

	2019				2018					
					Total					Total
	Jniversity Sources		External Sources	_	Financial Aid	Iniversity Sources		External Sources	_	Financial Aid
Undergraduate	\$ 130,092	\$	62,501	\$	192,593	\$ 131,209	\$	55,025	\$	186,234
Graduate	183,136		85,907		269,043	 166,719		80,220		246,939
Total financial aid grants	\$ 313,228	\$	148,408	\$	461,636	\$ 297,928	\$	135,245	\$	433,173

Agency activities such as tuition aid grants and Federal Pell Grant Program awards are not included in the University's consolidated financial statements. Both receipts and disbursements for these agency transactions were \$12.0 million and \$11.5 million in years ended June 30, 2019 and 2018, respectively.

#### 10. Pledges Receivable

Unconditional promises to give appear as pledges receivable and revenue of the appropriate net asset category. Pledges are recorded net of an allowance for uncollectible contributions and a discount to reflect the net present value based on projected cash flows. Periodically unconditional promises to give are reviewed for collectability. As a result, the allowance for uncollectible contributions may be adjusted and some contributions may be adjusted or cancelled. Such changes will be reflected in the consolidated financial statements.

Unconditional promises, and their expected collection dates, were as follows at June 30:

	 2019		2018
Less than one year	\$ 196,233	\$	207,717
One to five years	441,797		488,678
More than five years	159,090		171,850
Total unconditional promises	 797,120	·	868,245
Less: Allowance for doubtful contributions	(31,494)		(30,414)
Less: Net present value discount	(100,786)		(110,618)
Net pledges receivable	\$ 664,840	\$	727,213

New pledges recorded in the years ended June 30, 2019 and 2018, were discounted at an average annual rate of 2.03 percent and 3.22 percent, respectively, using a rate that considers market and credit risk. Credit risk is also considered in the allowance for doubtful contributions.

Pledges receivable were intended for the following purposes as of June 30:

	 2019	 2018
Endowment for educational and general purposes	\$ 349,385	\$ 378,919
New construction and modernization of plant	136,648	158,583
Support of University operations	178,807	189,711
Net pledges receivable	\$ 664,840	\$ 727,213

**Notes to the Consolidated Financial Statements** 

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

The University also has other outstanding pledges of \$202.8 million as of June 30, 2019. These pledges represent either gifts with donor-imposed conditions, containing both a barrier and a right of return/release, or other pledges that have not met the requirements for recognition.

#### 11. Land, Buildings, and Equipment

Investments in land, buildings, and equipment, net, consisted of the following at June 30:

	2019						2018					
	Bu	otal Land, ildings, and quipment		ccumulated	Bu	Net Land, iildings, and Equipment	Bu	otal Land, ildings, and Equipment		ccumulated epreciation	Bu	Net Land, ildings, and quipment
Land Building and building	\$	478,254	\$	-	\$	478,254	\$	459,919	\$	-	\$	459,919
improvements Construction in progress		6,463,174 600,301		3,048,678		3,414,496 600,301		6,130,428 488,606		2,811,457		3,318,971 488,606
Equipment Total	\$	583,020 8,124,749	\$	361,805 3,410,483	\$	221,215 4,714,266	\$	533,389 7,612,342	\$	325,243 3,136,700	\$	208,146 4,475,642

The University uses componentized depreciation to calculate depreciation expense for buildings and building improvements for research facilities included in operations. The costs of research facilities are separated into the building shell, building service systems, and fixed equipment, and each component is separately depreciated.

Equipment includes physical assets owned by the University as well as capitalized software costs and moveable equipment acquired through capitalized leases.

Building and building improvements include physical assets owned by the University as well as leasehold improvements, capitalized space leases, and construction in progress. Capitalized space leases at June 30, 2019 and 2018, were \$70.7 million and \$73.3 million, respectively.

#### 12. Accrued Employee Benefit Liabilities

Accrued employee benefit liabilities arise from employment at the University. These include liabilities for pension, postretirement benefits, postemployment benefits, unused vacation, and deferred compensation.

Postemployment benefits relating to workers' compensation, short-term disability, and continuation of medical benefits for those on long-term disability are provided to former or inactive employees after employment but before retirement. The University records the costs of such benefits on an accrual basis if the employee has provided the services from which those benefits are derived. As of June 30, 2019 and 2018, the actuarially computed liabilities on the University's consolidated statements of financial position are \$60.0 million and \$56.4 million, respectively.

## The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### 13. Pension and Other Postretirement Benefit Costs

#### **Pension Plan Benefits**

The University has four non-contributory pension plans (the "pension plans") for supporting staff employees. All four pension plans are subject to collective bargaining agreements. Until December 31, 2018 the former employees of the Arden Conference Center, which closed in 2005, were covered under a fifth plan. As of January 1, 2019 this plan has been consolidated into the Retirement Plan for Supporting Staff of Columbia University. Two of the plans include defined benefits for past and future service. Two of the pension plans provide defined benefits for service prior to January 1 and July 1, 1976, respectively. For these two pension plans, future benefits are provided by defined contribution plans. Charges to expenditures for the defined contribution segments of the plans amounted to \$4.0 million and \$5.4 million for the years ended June 30, 2019 and 2018, respectively.

In addition, the University provides retirement benefits for full-time faculty, officers, and certain other employees under a separate defined contribution plan (the "officer plan"). University contributions for the officer plan reported in operating expenses were \$151.1 million and \$137.3 million for the years ended June 30, 2019 and 2018, respectively.

#### Postretirement Health Care and Life Insurance Benefits

The University provides postretirement health care and life insurance benefits for certain employees. The University accrues the estimated cost of these benefits over the years that eligible employees render service.

#### **Obligations and Funded Status**

The University follows authoritative guidance, which requires recognition on the consolidated statements of financial position of the difference between benefit obligations and any plan assets of the University's defined benefit and other postretirement benefit plans. In addition, the authoritative guidance requires unamortized amounts (e.g., net actuarial gains or losses and prior service cost or credits) to be recognized as changes to net assets without donor restrictions and that those amounts be adjusted as they are subsequently recognized as components of net periodic pension cost.

Amounts recognized in net assets without donor restrictions are as follows:

		Benefits				
		2019	2018	2019		2018
Net actuarial (gain) / loss	\$	51,647	\$ 45,398	\$ (55,745)	\$	(34,094)
Prior service (credit) / cost		246	311	-		-
Total amount recognized	\$	51,893	\$ 45,709	\$ (55,745)	\$	(34,094)

Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

The components of accrued benefit costs for pension benefits and other postretirement benefits are as follows:

	Pension Pla	n Ronofits	Other Postretirement Benefits				
	2019	2018	2019	2018			
Change in benefit obligation:							
Benefit obligation, beginning of year	\$ 209,046	\$ 210,284	\$ 145,152	\$ 146,708			
Service cost	7,916	8,220	6,241	6,713			
Interest cost	9,046	8,514	5,734	5,724			
Plan participants' contributions	-	-	6,103	6,050			
Actuarial (gain) / loss	16,711	(10,877)	(22,676)	(8,421)			
Federal subsidy	-	-	596	200			
Net disbursements and transfers	(6,998)	(7,095)	(9,803)	(11,822)			
Benefit obligation, end of year	235,721	209,046	131,347	145,152			
Change in plan assets:							
Fair value of assets, beginning of year	176,906	165,710	200,805	192,340			
Actual return on plan assets	18,846	6,571	14,214	14,237			
Employer contributions	10,478	11,720	-				
Plan participants' contributions	-	-	6,103	6,050			
Net disbursements and transfers	(6,998)	(7,095)	(9,803)	(11,822)			
Fair value of assets, end of year	199,232	176,906	211,319	200,805			
Net amount recognized	\$ (36,489)	\$ (32,140)	\$ 79,972	\$ 55,653			

Weighted-average assumptions used to determine		
end of year benefit obligation	2019	2018
Discount rate	3.20% to 3.75%	3.95% to 4.25%
Rate of compensation increase	3.00%	3.25%

The accumulated benefit obligations for the two underfunded pension plans at June 30, 2019 and 2018, were \$203.4 and \$182.4 million, respectively.

At June 30, 2019 and 2018, the projected benefit obligation exceeded the pension plan assets for two of the four plans. The projected benefit obligation for the pension plans with a benefit obligation in excess of plan assets were as follows:

End of year	2019		
Projected benefit obligation	\$ 224,753	\$	202,488
Fair value of plan assets	185,578		166,497

#### Notes to the Consolidated Financial Statements

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

The accumulated postretirement benefit obligation for the other postretirement benefit plan and the fair value of plan assets with plan assets in excess of the accumulated postretirement benefit obligation was as follows:

End of year	2019		
Accumulated postretirement benefit obligation	\$ 131,347	\$	145,152
Fair value of plan assets	211,319		200,805

A 6.25 percent annual rate of increase in the per capita cost of covered health care benefits for the other postretirement benefit plan was assumed for 2019. The rate was assumed to decrease gradually to 5.00 percent for year ended June 30, 2025 and remain at that level thereafter. Assumed health care cost trend rates have a significant effect on the amounts reported for the health care plans. A one-percentage-point change in assumed health care cost trend rates would have the following effect:

	1-%-point increase		1-%-point decrease	
Effect on accumulated postretirement benefit obligation	\$	17,562	\$ (14,053)	

The asset allocation for the two defined benefit plans for both past and future service at June 30, 2019 and 2018, and the target allocation for 2020, by asset category, follows:

	Target allocation 2020	Percentage of plan assets at year end		
		2019	2018	
Asset category				
U.S. large cap equity and global equity funds	26%	18%	18%	
International equities (non-U.S.)	14%	21%	21%	
High yield fixed income securities	10%	10%	10%	
U.S. core fixed income	50%	51%	51%	
	100%	100%	100%	

The asset allocation for the two defined benefit plans for prior service only at June 30, 2019 and 2018, and the target allocation for 2020, by asset category, follows:

	Target allocation	Percentage of plan assets at year end		
	2020	2019	2018	
Asset category				
U.S. large cap equity	10%	6%	4%	
International equities (non-U.S.)	5%	11%	9%	
High yield fixed income securities	5%	1%	11%	
U.S. core fixed income	80%	82%	76%	
	100%	100%	100%	

The retirement plan for the employees of Arden Conference Center was invested in equity securities, including mutual funds, 35 percent, and debt securities, 65 percent as of June 30, 2018. As this plan has been consolidated as of January 1, 2019, the associated asset allocation and target allocation are reflected in the table above at June 30, 2019.

#### **Notes to the Consolidated Financial Statements**

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

The following presents investments of the pension plans as of June 30, 2019. The Plans' investments in mutual funds are included as Level 1 because fair value is based on quoted prices. The Plans' investments in common collective trusts are valued at NAV as a practical expedient and are therefore excluded from the fair value hierarchy and are reported as NAV. Level 3 assets represent fixed income related investment contracts with a major life insurance company.

	Leve	<u>l 1</u>	Level 2	L	evel 3	NAV		Total	
Common collective trust funds									
Global equity						\$	74,390	\$	74,390
Fixed income							122,781		122,781
Fixed income investment contracts				\$	2,061				2,061
Investments, at fair value	\$	_		\$	2,061	\$	197,171	\$	199,232

The following table is a roll forward of the amounts for investments classified within Level 3 as described above.

	me 30, 2018	Purchases Sales (Gross) (Gross)		Investment gain/(loss)		June 30, 2019		
Investment contracts	\$ 2,113	\$ _	\$	(165)	\$	113	\$	2,061
Total level 3 investments	\$ 2,113	\$ -	\$	(165)	\$	113	\$	2,061

The following presents investments of the pension plans as of June 30, 2018:

	L	evel 1	Level 2	L	evel 3	NAV	 Total
Common collective trust funds							
Global equity						\$ 64,406	\$ 64,406
Fixed income						109,229	109,229
Mutual funds	\$	1,158					1,158
Fixed income investment contracts				\$	2,113		2,113
Investments, at fair value	\$	1,158		\$	2,113	\$ 173,635	\$ 176,906

The following table is a roll forward of the amounts for investments classified within Level 3 as described above.

	une 30, 2017	Purchases (Gross)		Sales (Gross)		Investment gain/(loss)		June 30, 2018	
Investment contracts	\$ 2,158	\$	46	\$	(154)	\$	63	\$	2,113
Total level 3 investments	\$ 2,158	\$	46	\$	(154)	\$	63	\$	2,113

#### **Notes to the Consolidated Financial Statements**

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

The asset allocation for the other postretirement benefit plan at June 30, 2019 and 2018, and the target allocation for 2020, by asset category, follows:

	Target allocation	Percentage assets at year	-
	2020	2019	2018
Asset category			
U.S. large cap equity and global equity funds	52%	49%	49%
International equities (non-U.S.)	16%	19%	19%
U.S. fixed income	32%	32%	32%
	100%	100%	100%

The following presents investments of the other postretirement benefit plan as of June 30, 2019. The Plans' investments in common collective trusts are valued at NAV as a practical expedient and are therefore excluded from the fair value hierarchy and reported as NAV.

	Level 1	Level 2	Level 3	NAV	Total
Common collective trust funds					
Global equity				\$ 144,012	\$ 144,012
Fixed income				67,307	67,307
Investments, at fair value				\$ 211,319	\$ 211,319

The following presents investments of the other postretirement benefit plan as of June 30, 2018:

	Level 1	Level 2	Level 3	NAV	Total
Common collective trust funds					
Global equity				\$ 136,370	\$ 136,370
Fixed income				64,435	64,435
Investments, at fair value				\$ 200,805	\$ 200,805

#### **Net Periodic Benefit Cost**

The components of net periodic benefit cost for pension benefits and other postretirement benefits are as follows:

	Pension Plan Benefits				Other Postretirement Benefits			
		2019		2018		2019		2018
Components of net periodic benefit cost								
Service cost	\$	7,916	\$	8,220	\$	6,242	\$	6,713
Interest cost on projected benefit obligation		9,045		8,514		5,734		5,724
Expected return on assets		(10,203)		(9,357)		(12,374)		(11,816)
Amortization of prior service cost/(credit)		65		65		-		
Amortization of unrecognized net losses/(gain)		1,820		3,145		(2,619)		(459)
Net periodic benefit cost		8,643		10,587		(3,017)		162

#### **Notes to the Consolidated Financial Statements**

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### Amounts recognized in the Consolidated Statements of Activities

A summary of changes in plan assets and benefit obligations recognized in the consolidated statements of activities is as follows:

	Pension Plan Benefits			nefits	Other Postretirement Benefits			
		2019		2018		2019		2018
Summary of changes in plan assets and benefit obligations recognized in the Consolidated Statements of Activities						<b>.</b>		
Net periodic benefit cost - service cost	\$	7,916	\$	8,220	\$	6,242	\$	6,713
Total recognized in operating		7,916		8,220		6,242		6,713
Net periodic benefit cost other than service cost		727		2,367		(9,259)		(6,550)
Current year actuarial (gain)/loss		8,069		(8,092)	(	(24,270)	(	(11,009)
Amortization of actuarial gain/(loss)		(1,820)		(3,145)		2,619		459
Amortization of prior service credit/(cost)		(65)		(65)				
Total recognized in nonoperating		6,911		(8,935)		(30,910)		(17,100)
Total recognized in operating								
and nonoperating	\$	14,827	\$	(715)	\$	(24,668)	\$	(10,387)

Amounts in net assets without donor restrictions expected to be recognized in net periodic benefit cost in fiscal year 2020 are as follows:

·	Pension	Pension Plan Benefits				
Actuarial (gain)/loss	\$	2,789	\$	(3,467)		
Prior service (credit)/cost		65		-		
	\$	2,854	\$	(3,467)		

Weighted-average assumptions used to determine net	2019	2018
periodic pension cost		
Discount rate	3.95% to 4.25%	3.35% to 3.95%
Expected return on plan assets	3.75% to 6.50%	3.75% to 6.50%
Rate of compensation increase	3.25%	3.25%

To arrive at assumptions for expected long-term rates of return on assets in the pension plans and the postretirement benefit plan, the University considered historical returns and future expectations for returns in each asset class in the asset allocation for the previously described pension and postretirement benefit portfolios.

Assumed health care cost trend rates have a significant effect on the amounts reported for the other postretirement benefit plan. A one-percentage-point change in the assumed health care cost trend rates would have had the following effect:

	_	% point	_	point rease
Effect on total service and interest cost	\$	2,227	\$	(1,720)

### The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### **Expected Cash Flows**

Information about the expected cash flows for the plans is as follows:

	 nsion Plan Benefits	Other Postretirement Benefits		
<b>Expected University contributions</b>				
2020	\$ 8,561	\$	-	
Expected benefit payments				
2020	7,468		5,442	
2021	7,926		5,590	
2022	8,434		5,698	
2023	8,998		5,795	
2024	9,587		6,000	
2025-2029	56,883		35,062	
Total	\$ 99,296	\$	63,587	

Total benefits expected to be paid include both the University's share of the benefit cost net of Medicare subsidies and the participants' share of the cost, which is funded by participant contributions to the other postretirement benefit plan. The University receives a Medicare Part D subsidy from the federal government as reimbursement for certain retiree health benefits paid to plan participants, which was approximately \$0.4 million in fiscal year 2019.

### The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### 14. Lease Obligations

The University is the lessee of various equipment and space under noncancelable operating and capital leases. Capital lease obligations at June 30, 2019 and 2018, were \$126.1 million and \$121.3 million, respectively. Operating lease rental expense for the years ended June 30, 2019 and 2018 was \$45.8 million and \$40.4 million, respectively. Space leases contain customary escalation clauses, which are included in annual aggregate minimum rentals.

Future aggregate minimum rental payments under operating and capital leases are as follows:

	O	\$ 44,144 38,413 32,714		Capital
Future minimum rental payments:				_
2020	\$	44,144	\$	10,134
2021		38,413		9,776
2022		32,714		8,858
2023		28,194		7,382
2024		27,012		6,327
Thereafter		243,005		216,420
Less: Interest at 1.45 percent to 5.31 percent				(132,770)
Capital lease obligations at June 30, 2019			\$	126,127

#### 15. Conditional Asset Retirement Obligations

Conditional asset retirement obligations are a legal obligation to perform an asset retirement activity in which the timing and/or method of settlement are conditioned on a future event that may or may not be within the control of the University. GAAP requires that the fair value of a liability be recognized in the period in which it occurred if a reasonable estimate of fair value can be made. Uncertainty with respect to the timing and/or method of settlement of the asset retirement obligation does not defer recognition of a liability.

Conditional asset retirement obligations related to remediation or disposal of asbestos, underground storage tanks, soil, radioactive sources, equipment, and miscellaneous other items were \$118.9 million and \$119.2 million at June 30, 2019 and 2018, respectively.

## The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### 16. Bonds and Notes Payable

Bonds and notes payable outstanding are as follows at June 30:

	2019	2018
Dormitory Authority of the State of New York, tax exempt		
revenue bonds, Columbia University issues:	4 4 70 000	<b>.</b>
Series 2018 A, 2.45% to 3.41%, maturing FY2029 to FY2049	\$ 150,000	\$ 150,000
Series 2018 B, 2.98%, maturing FY2039	175,185	175,185
Series 2017 A, 2.40% to 3.49%, maturing FY2028 to FY2048	150,000	150,000
Series 2017 B, 1.96% to 2.61%, maturing FY2025 to FY2030	40,475	40,475
Series 2016 A-1, 1.67%, maturing FY2027	50,000	50,000
Series 2016 A-2, 1.35% to 2.89%, maturing FY2024 to FY2047	130,000	130,000
Series 2016 B, 0.80% to 2.04%, maturing FY2020 to FY2032	168,810	189,715
Series 2015 A, 1.95% to 3.00%, maturing FY2026 to FY2046	92,535	92,535
Series 2015 B, 1.13% to 1.88%, maturing FY2020 to FY2025	32,735	37,930
Series 2012 A, 1.31% to 1.92%, maturing FY2020 to FY2023	126,290	137,935
Series 2011 A, 2.96% to 4.88%, maturing FY2020 to FY2042	270,000	285,000
Series 2009 A, variable rate, 1.60%, maturing FY2039	117,000	117,000
Series 2003 B, variable rate, 1.60%, maturing FY2028	30,000	30,000
Series 2002 C, variable rates, 1.44% to 1.55%, maturing FY2027	23,300	23,300
Taxable Series 2015, 3.46%, maturing FY2046	75,000	75,000
Taxable Series 2012, 3.83%, maturing FY2043	100,000	100,000
New Jersey Economic Development Corporation, tax exempt		
Series 2002, variable rate, 1.60%, maturing FY2020 to FY2028	4,665	5,110
Medium-Term Notes, Taxable Series C 6.53% to 7.36%,		
maturing FY2021 to FY2022	13,308	20,567
Empire State Development Corporation issues:		
9.00%, maturing FY2029	5,718	6,099
Interest-free, maturing FY2020	8,100	8,100
Economic Development Corporation		
Interest-free, maturing FY2020	10,000	10,000
Subtotal, principal payments	1,773,121	1,833,951
Unamortized bond premium	231,758	255,863
Unamortized cost of issuance	(4,679)	(5,529)
Subtotal, bond premium and cost of issuance	227,079	250,334
Total bonds and notes payable	\$ 2,000,200	\$ 2,084,285

**Notes to the Consolidated Financial Statements** 

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

Estimated principal payments on bonds and notes payable are summarized below:

Fiscal Year	Principal
2020	\$ 81,933
2021	73,326
2022	78,347
2023	81,692
2024	27,875
Thereafter (through 2049)	1,429,948
Total	\$ 1,773,121

The University issues most of its tax-exempt debt through the Dormitory Authority of the State of New York ("DASNY"). On May 16, 2018, the University issued \$150 million of Series 2018A and \$175.2 million of Series 2018B, all tax-exempt fixed rate bonds. Series 2018A was issued at a premium of \$41.5 million which will be amortized over 10 and 30 years based on the maturity of the underlying bonds. Series 2018B was issued at a premium of \$30.1 million which will be amortized over 10 years based on the optional redemption date. The proceeds from Series 2018A will be used to finance various construction and renovation projects. The proceeds from Series 2018B were used to redeem outstanding Series 2008A Bonds. The redeemed bonds were legally defeased and, as such, are not reflected in "Bonds and notes payable" at June 30, 2018.

The University recorded amortization of bond premium and issuance costs, net, of \$24.1 million and \$19.3 million for the years ended June 30, 2019 and 2018, respectively, as a reduction to interest expense.

The University has a \$150 million taxable commercial paper program. As of June 30, 2019, and 2018, there was no commercial paper outstanding under this program.

As of June 30, 2019, the University had a \$200 million operating line of credit, which expires in October, 2022, as well as a \$100 million operating line of credit, which expires in November, 2020. Additionally, as of June 30, 2019, the University had two \$100 million standby lines of credit supporting self-liquidity for variable rate debt outstanding, one that expires in January, 2022 and a second that expires in January, 2020. Each of the lines is with a different lending institution and, as of June 30, 2019, no balances were outstanding on the lines of credit.

The University has administrative covenants on its tax-exempt debt and lines of credit, with which it was in compliance as of June 30, 2019 and 2018.

On October 1, 2008, the University entered into a \$200 million notional value fixed payer interest rate swap agreement to protect against the risk of interest rate changes. The estimated fair value of the swap liability was \$76.1 million and \$57.1 million at June 30, 2019 and 2018, respectively. The fair value of the swap is obtained by taking the present value of all future cash flows on the swap implied by the forward curve.

## The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### 17. Insurance

In connection with managing financial risks through various third-party insurance programs, the University is self-insured in certain areas. Funded self-insurance liabilities primarily cover deductibles on general liability, trustees and officers' liability, and property insurance claims. Self-insurance liabilities are actuarially calculated on an annual basis. The University's core liability coverage is purchased through Pinnacle RRG, a Vermont-based risk retention group with seventeen other universities.

The University obtains medical malpractice insurance through MCIC and MLMIC. MCIC is a group-captive insurance company owned by the University, The Johns Hopkins Hospital, The Johns Hopkins University, University of Rochester Medical Center, Weill Cornell Medical College, Yale New Haven Health, Yale University School of Medicine, and NYP. MLMIC is a mutual company where policyholders are owners with full voting rights to elect the company's Board of Directors, thereby having direct input into vital areas of operation. The governing Board is comprised primarily of practicing physicians, dentists, and hospital administrators. More than 1,900 of the University's faculty physicians and dentists are enrolled in MCIC or MLMIC. The University has recorded self-insurance and medical malpractice liabilities of approximately \$306.7 million and \$289.0 million as of June 30, 2019 and 2018, respectively in "Other long-term liabilities". The medical malpractice liabilities of approximately \$185.1 million and \$176.2 million as of June 30, 2019 and 2018, respectively, are reported gross with an offsetting receivable for anticipated recoveries of \$126.7 million and \$119.5 million, respectively, recorded in "Other assets".

#### 18. Related Party Transactions

The University maintains several clinical and education affiliation agreements with other organizations. Revenues and expenses from these agreements are accounted for in the operating activities section of the consolidated statements of activities. The most significant affiliation agreement is with NYP.

The University receives reimbursement from NYP for the provision of medical, professional, and supervisory staff services as well as other technical assistance. NYP provides funding to clinical departments for specific purposes including administration, supervision, and teaching of the NYP resident staff and salary support for faculty and staff providing services to NYP. In addition, NYP provides funding for clinical programs that the University and NYP would like to see developed or expanded. NYP also provides the departments with certain facilities and services (outpatient faculty practice offices, nursing, telecommunications, etc.) for which the University is invoiced on a monthly basis. Finally, the University and NYP collaborate and fund joint projects for which specific agreements are negotiated.

In addition, the University and NYP negotiate a joint budget, which forms the basis for the affiliation agreement. The fiscal year 2019 joint budget was approximately \$363.0 million. The payments to NYP for goods and services were \$97.6 million. The majority of revenues received pursuant to this agreement are reflected in the consolidated financial statements as a portion of "Patient care revenue" and the majority of the expenses related to this agreement are reflected in "Patient care expense".

# The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018 (in thousands of dollars, unless otherwise noted)

The University records both receivables from and payables to NYP on the consolidated statements of financial position. The University has no liability for obligations and debt incurred by NYP. During fiscal year 2018, the University and NYP collaborated by opening a radiological imaging center, ColumbiaDoctors/NewYork-Presbyterian Imaging, Inc. (CDNYPI). CDNYPI is a not-for-profit membership corporation, which was incorporated to operate pursuant to the terms and provisions of Article 28 of the New York Public Health Law, whereby it provides a full range of general radiology and interventional radiology services. In order to provide for efficient delivery of services and to secure a high level of expertise from existing resources, CDNYPI has entered into clinical and administrative agreements with the University and NYP. The revenue generated from these agreements was \$24.1 million and \$18.2 million for the years ended June 30, 2019 and 2018, respectively. In addition, the University recorded an interest in CDNYPI in the amount of \$9.3 million and \$3.3 million as of June 30, 2019 and 2018, respectively.

The University had a financial arrangement with Neurological Associates, P.C., a New York physician professional corporation ("PC"), whereby the University provides facilities and other services to the PC for a negotiated fee. This PC provides clinical services to patients and is owned and controlled by physicians who are also faculty members of the University. The non-controlled PC generated revenue of approximately \$41.8 million and \$40.3 million for the years ended June 30, 2019 and 2018, respectively, which has not been consolidated into the University's consolidated financial statements.

The University controls a not-for-profit practice entity and three professional corporations and, as such, consolidates these entities into the University's consolidated financial statements.

Pursuant to the consent of the Trustees of the CPMC Fund, Inc., during the year ending June 30 2019, the CPMC Fund, Inc. transferred to the University one endowment previously held by CPMC Fund, Inc. for the University. The value of the endowment at the time of transfer was \$18.5 million, with \$11.5 million being donor-restricted funds that the University must hold in perpetuity.

**Notes to the Consolidated Financial Statements** 

For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### 19. Liquidity and Availability of Resources

The University's financial assets and liquidity resources available for general expenditures within one year of the date of the consolidated statements of financial position are as follows:

	 2019	 2018
Financial Assets:	 	_
Cash and cash equivalents	\$ 814,040	\$ 1,006,998
Accounts receivable, net	535,861	529,753
Pledges receivable for operations and plant, net	121,862	120,981
Operating investments	942,388	841,772
Approved endowment payout for subsequent year	563,663	530,852
Other financial assets	 52,943	 123,109
Total financial assets available within one year	3,030,757	3,153,465
Liquidity resources:		
Taxable commercial paper (unexpended)	150,000	150,000
Bank lines of credit (undrawn)	 500,000	 500,000
Total financial assets and liquidity resources		
available within one year	\$ 3,680,757	\$ 3,803,465

As part of the University's liquidity management, financial assets are structured to be available as its general expenditures, liabilities, and other obligations come due. In addition, the University may invest cash in excess of daily requirements in short-term and/or liquid investments. To further help manage unanticipated liquidity needs, the University has committed lines of credit in the amount of \$500 million along with a \$150 million taxable commercial paper program. As of June 30, 2019, there are no amounts outstanding under these credit facilities.

Additionally, the University has board-designated funds functioning as endowments of \$3.3 billion as of June 30, 2019 and 2018, respectively. Although the University does not intend to spend from these endowments other than amounts appropriated for general expenditure as part of its annual appropriation process, \$2.9 billion of these endowments without donor restrictions could be made available if necessary. However, both the funds functioning as endowment and donor-restricted endowments contain investments with lock-up provisions that reduce the total investments that could be made available (see Note 6 for disclosures about investments).

#### 20. Contingencies and Commitments

From time to time, various claims and suits generally incident to the conduct of normal business are pending or may arise against the University.

In the opinion of counsel and management of the University, after taking into account insurance coverage, losses, if any, from the resolution of pending litigation should not have a material effect on the University's financial position or results of operations.

All funds expended in connection with government grants and contracts are subject to audit by government agencies. While the ultimate liability, if any, from audits of government grants and contracts by government agencies, claims, and suits is presently not determinable, it should not, in

# The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018 (in thousands of dollars, unless otherwise noted)

the opinion of counsel and management, have a material effect on the University's financial position or results of activities.

The University is subject to laws and regulations concerning environmental remediation and will, from time to time, establish reserves for potential obligations that management considers probable and for which reasonable estimates can be made. As of June 30, 2019, the University has recorded \$118.9 million for conditional asset retirement obligations. These estimates may change depending upon the nature and extent of contamination, appropriate remediation technologies, and regulatory approvals. The University is not aware of any existing conditions that it currently believes are likely to have a material adverse effect on the University's financial position, changes in net assets, or cash flows.

The University's capital improvement program and related commitments includes projects that address the major strategic objectives of the University. As part of the capital improvement program, the University has entered into contracts to purchase properties with an aggregate value of \$72.8 million. As of June 30, 2019, approximately \$70.3 million is still outstanding.

The University has made commitments related to its expansion in Manhattanville, certain of which are based upon events in the future which would result in cash and in-kind payments from the University. Those that are estimable have been recorded as liabilities.

# The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements For the Years Ended June 30, 2019 and 2018

(in thousands of dollars, unless otherwise noted)

#### 21. Expenses by Functional and Natural Classification

Expenses are reported for the University's primary program activities. The consolidated statements of activities also report certain categories of expenditures that support more than one major program of the University. These expenses include operation and maintenance of plant, depreciation expense, and interest expense.

Expenses by functional and natural classification for the years ended June 30, 2019 and 2018 are as follows:

					2017				
					Final A	Alloca	ted Natural Ex	pense	s
	E	xpenses per							Final
	St	atement of		Co	mpensation				Allocated
		Activities	 Allocation	aı	nd Benefits		Other		Expenses
Instruction and educational administration	\$	1,971,252	\$ 292,400	\$	1,510,668	\$	752,984	\$	2,263,652
Research		639,873	101,100		387,610		353,363		740,973
Patient care expense		1,099,268	79,572		924,060		254,780		1,178,840
Operation and maintenance of plant		284,831	(284,831)						
Institutional support		312,613	51,000		216,912		146,701		363,613
Auxiliary enterprise		166,217	104,264		104,130		166,351		270,481
Depreciation expense		289,998	(289,998)						
Interest expense		53,507	(53,507)						
Total operating expenses		4,817,559	-	-	3,143,380		1,674,179		4,817,559
Net periodic benefit cost other than service cost		(8,532)			(8,532)				(8,532)
Total expenses	\$	4,809,027	\$ -	\$	3,134,848	\$	1,674,179	\$	4,809,027
					2018				
	-				Final A	Alloca	ted Natural Ex	pense	s
	E	xpenses per							Final
	St	atement of		Co	mpensation				Allocated

						Final Allocated Natural Expenses					
	E	kpenses per			· ·					Final	
	St	atement of			Con	mpensation				Allocated	
		Activities	A	llocation	ar	nd Benefits		Other		Expenses	
Instruction and educational administration	\$	1,874,242	\$	290,129	\$	1,417,743	\$	746,628	\$	2,164,371	
Research		603,648		103,886		370,071		337,463		707,534	
Patient care expense		1,025,611		75,800		856,576		244,835		1,101,411	
Operation and maintenance of plant		269,529		(269,529)							
Institutional Support		307,127		26,352		213,688		119,791		333,479	
Auxiliary enterprise		157,564		107,137		98,852		165,849		264,701	
Depreciation expense		278,897		(278,897)							
Interest expense		54,878		(54,878)							
Total operating expenses		4,571,496		-		2,956,930		1,614,566		4,571,496	
Net periodic benefit cost other than service cost		(4,183)				(4,183)				(4,183)	
Total expenses	\$	4,567,313	\$	-	\$	2,952,747	\$	1,614,566	\$	4,567,313	
	_				_						

The allocation of operation and maintenance of plant is based on square footage occupancy. Depreciation expense includes depreciation of buildings, building improvements, and equipment. The allocation of depreciation on buildings and building improvements is based on square footage occupancy. Depreciation on equipment is allocated to the programs for which the equipment was purchased. Interest expense is allocated according to the same methodologies used for building depreciation.

### The Trustees of Columbia University in the City of New York Notes to the Consolidated Financial Statements

For the Years Ended June 30, 2019 and 2018 (in thousands of dollars, unless otherwise noted)

#### 22. Subsequent Events

The University has performed an evaluation of subsequent events through October 8, 2019, which is the date the consolidated financial statements were issued.

Beginning July 1, 2019, the University assumed control of the Neurosurgical Associates, P.C. and will consolidate the activity of this PC subsequent to this date into the University's consolidated financial statement.

# **Supplemental Schedule**

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Research & Development Cluster	<u> </u>				
Department of Health & Human Services					
Direct Awards					
Centers for Disease Control and Prevention/DHHS					
Tuberculosis Trials Consortium	93	CDC 200-2009-32593		0	203,08
Tuberculosis Trials Consortium	93	CDC 200-2009-32593		0	77,50
A Prospective Comprehensive Epidemiologic Study in a Large Cohort in the National ALS Registry: Identifying ALS Risk Factors	93	200-2013-56886		0	61,084
Promising Practices in OSH for Healthy Aging in the Workplace	93	200-2016-M-91030		0	15,00
CISA Clinical Vaccine Safety Evaluation - Contributing Contractor	93	CDC 200-2012-53665 TASK-05		0	11,47
CISA Clinical Vaccine Safety Evaluation - Contributing Contractor	93	CDC 200-2012-53665 TASK-05		0	9,27
CISA Clinical Vaccine Safety Evaluation - Contributing Contractor	93	CDC 200-2012-53665 TASK-05		0	4,53
CISA Clinical Vaccine Safety Evaluation - Contributing Contractor	93	CDC 200-2012-53665 TASK-05		0	11
Food & Drug Administration					
Studies on Hair Loss (Alopecia)Associated with Use of Cosmetic Hair Products and Ingredients in These Products	93	HHSF223201810176P		0	36,061
				\$0	\$418,116
Training in General, Pediatric, and Public Health Dentistry					
Postdoctoral Training in General, Pediatric and Public Health Dentistry and Dental Hygiene	93.059	6D88HP20109-09-02		0	877,91
Predoctoral Training in General, Pediatric & Public Health Dentistry & Dental Hygeine	93.059	5D85HP20031 -09- 00		0	345,427
Postdoctoral Training in General, Pediatric and Public Health Dentistry and Dental Hygiene	93.059	6D88HP20109-09-02		0	11,046
Predoctoral Training in General, Pediatric & Public Health Dentistry & Dental Hygeine	93.059	5D85HP20031 -09- 00		0	736

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Postdoctoral Training in General, Pediatric and Public Health Dentistry and Dental Hygiene					(Includes Subrecipients)
r ostaceorar maining in certeral, i ediatie and i dole nearth bentistry and bentistry gene	93.059	6D88HP20109-09-02		0	582
Postdoctoral Training in General, Pediatric and Public Health Dentistry and Dental Hygiene	93.059	6D88HP20109-09-02		0	-819
				\$0	\$1,234,883
Innovations in Applied Public Health Research					
Novel extracellular vesicle and molecular biomarkers of environmental exposure and disease progression in ALS	93.061	5R01TS000285-02-00		0	133,897
Novel extracellular vesicle and molecular biomarkers of environmental exposure and disease progression in ALS	93.061	5R01TS000285-02-00		0	107,006
Novel extracellular vesicle and molecular biomarkers of environmental exposure and disease progression in ALS	93.061	5R01TS000285-02-00		0	55,494
				\$0	\$296,397
Food and Drug Administration Research					
Phase 2b Study of Denosumab to Prevent bone Loss in Idiopathic Osteoporosis in Premenopausal Women Treated with Teriparatide	93.103	5R01FD005114-04		0	374,753
Pregnancy and lactation associated osteoporosis: Bone microstructure and metabolism, genotypic characteristics, natural history and biomarkers of disease severity.	93.103	5R01FD006007 03		0	284,157
Phase 2 study of combination therapy with PLX3397 and sirolimus to target tumor-associated macrophages in malignant peripheral nerve sheath tumors	93.103	5R01FD005745-02		0	183,222
Teriparatide for Idiopathic Osteoporosis in Premenopausal Women: A Phase 2 Study	93.103	5R01FD003902-06		0	176,804
Teriparatide for Idiopathic Osteoporosis in Premenopausal Women: A Phase 2 Study	93.103	5R01FD003902-06		0	175,081
Ph1 Study of T-Vec given endoscopically for advanced pancreatic cancer IN 17248 (11/21/2016)	93.103	5R01FD006108-02		6,926	167,166
Pregnancy and lactation associated osteoporosis: Bone microstructure and metabolism, genotypic characteristics, natural history and biomarkers of disease severity.	93.103	5R01FD006007 03		0	45,533
Phase 2b Study of Denosumab to Prevent bone Loss in Idiopathic Osteoporosis in Premenopausal Women Treated with Teriparatide	93.103	5R01FD005114-04		0	12,222
Phase 2 study of combination therapy with PLX3397 and sirolimus to target tumor-associated macrophages in malignant peripheral nerve sheath tumors	93.103	5R01FD005745-02		0	416
Teriparatide for Idiopathic Osteoporosis in Premenopausal Women: A Phase 2 Study	93.103	5R01FD003902-06		0	-1,013
				\$6,926	\$1,418,341

Federal Grantor / Pass-through Grantor	0504		5		R&D Cluster
rederal Grantor / Pass-tillough Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Injury Prevention and Control Research and State and Com	nmunity Based Programs				
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	130,680
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		28,495	113,607
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	110,639
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	107,053
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	94,738
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	86,079
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	74,118
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	12,199
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	10,631
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	9,867
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	5,372
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	3,841
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	2,920
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	2,866
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	1,837
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	1,003
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	82
Columbia Injury Control Research Center	93.136	6R49CE002096-05-06		0	64
				\$28,495	\$767,596

ederal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures (Includes Subrecipients)
lealth Program for Toxic Substances and Disease Registry					(moludes oublecipients)
Case-Control Studies Nested in National ALS Registry to Evaluate Environmental Risks	93.161	6R01TS000243-03-01		5,802	280,48
				\$5,802	\$280,489
lational Research Service Award in Primary Care Medicine					
NRSA for Primary Medical Care	93.186	5T32HP10260 -12- 00		0	217,80
NRSA for Primary Medical Care	93.186	5T32HP10260 -12- 00		0	47:
NRSA for Primary Medical Care	93.186	5T32HP10260 -12- 00		0	-5
				\$0	\$218,216
lational Research Service Awards Health Services Research Training					
Columbia University Patient Safety and Health Services Research Training	93.225	5T32HS026121-02		0	79,30
				\$0	\$79,308
tesearch on Healthcare Costs, Quality and Outcomes					
Topical Vancomycin for Craniotomy Wound PRophylaxis	93.226	5R01HS022903-05		232,462	441,79
Nursing Intensity of Patient Care Needs and Rates of Healthcare-associated Infections (NIC-HAI)	93.226	5R01HS024915-03		11,720	414,58
Infection Control in Home Care and Predictive Risk Modeling	93.226	5R01HS024723-03		248,206	370,54
Providing Evidence and Developing a Toolkit to Accelerate the Adoption of Patient Photographs in Electronic Health Records	93.226	5R01HS024713-02		126,528	360,11
Develop and Validate Health IT Safety Measures to Capture Violations of the 5 Rights of Medication Safety	93.226	5R01HS024538-04		49,010	277,64
TRÁNSFÓRM DEPCÁRE: A Theoretical approach to improving patient engagement and shared decision making for minorities in collaborative depression care	93.226	5R01HS025198-03		0	268,92
The Wise App Trial for Improving Health Outcomes in PLWH	93.226	5R01HS025071-04		25,830	253,55
Increasing the Uptake of the USPSTF Hypertension Screening Guidelines in Primary Care	93.226	5R01HS024262 05		21,737	192,92

For year ended June 30, 2019

Endowl Country / David through Country					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Using eHealth to Expand Access to Cognitive Behavioral Therapy for Insomnia in Hispanic Primary Care Patients	93.226	5R01HS024274-02		0	143,415
Anesthesia Exposure and Risk of Behavioral or Developmental Disorder	93.226	5K08HS022941-05		0	141,036
SINC: Synchronized Immunization Notifications	93.226	5R01HS023582-03		5,884	127,587
PRISM: Personalized Reminders for Immunization using Short Messaging systems	93.226	5R01HS022677-04		0	120,907
Increasing the Uptake of the USPSTF Hypertension Screening Guidelines in Primary Care	93.226	5R01HS024262 05		45,973	97,091
Nursing Intensity of Patient Care Needs and Rates of Healthcare-associated Infections (NIC-HAI)	93.226	5R01HS024915-03		8,501	90,850
Prenatal Exposure to Anesthesia and Subsequent Neurodevelopmental Disorders	93.226	5R01HS026493-02		6,850	85,335
The Wise App Trial for Improving Health Outcomes in PLWH	93.226	5R01HS025071-04		8,543	77,645
Providing Evidence and Developing a Toolkit to Accelerate the Adoption of Patient Photographs in Electronic Health Records	93.226	5R01HS024713-02		48,996	75,339
Multilevel analysis of anesthesia safety and costs during labor and vaginal deliveries	93.226	1R03HS025787-01A1		0	71,950
Infection Control in Home Care and Predictive Risk Modeling	93.226	5R01HS024723-03		70,162	70,162
Social Networks in Medical Homes and Impact on Patient Care and Outcomes	93.226	1R01HS025937-01A1		14,622	66,723
Simulation to Improve Infection Prevention and Patient Safety: The SIPPS Trial	93.226	1R18HS026418-01		0	46,531
Developing ICD-11: Coding of Quality and Patient Safety Data to support health services and outcomes research in the US and internationally	93.226	5R13HS024891-03		0	36,091
TRANSFORM DEPCARE: A Theoretical approach to improving patient engagement and shared decision making for minorities in collaborative depression care	93.226	5R01HS025198-03		0	34,733
Topical Vancomycin for Craniotomy Wound PRophylaxis	93.226	5R01HS022903-05		0	18,431
Develop and Validate Health IT Safety Measures to Capture Violations of the 5 Rights of Medication Safety	93.226	5R01HS024538-04		7,921	10,763
Assess Risk of Wrong Patient Errors in an EMR that Allows Multiple Records Open	93.226	7R21HS023704-04		2,543	10,565
SINC: Synchronized Immunization Notifications	93.226	5R01HS023582-03		0	1,315
Further Psychometric Testing and Validation of the Errors of Care Omission Survey (EoCOS)	93.226	5R03HS024758-02		0	1,265

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
<del>-</del>	CFDA	<u>FTOJECT NO</u>	rass-tirough Contract Number	Subrecipients	(Includes Subrecipients)
TRANSFORM DEPCARE: A Theoretical approach to improving patient engagement and shared decision making for minorities in collaborative depression care	93.226	5R01HS025198-03		0	225
				\$935,488	\$3,908,039
Occupational Safety and Health Program					
Impact of Patient Safety Climate on Infection Prevention Practices and Healthcare Worker and Patient Outcomes	93.262	6K01OH011186-03M001		0	83,580
Impact of Patient Safety Climate on Infection Prevention Practices and Healthcare Worker and Patient Outcomes	93.262	6K01OH011186-03M001		0	19,173
				\$0	\$102,753
Centers for Disease Control and Prevention Investigations and Technical Ass	sistance				
MOSAIC: Mobile Surveillance for ARI and ILI in the Community	93.283	5U01IP000618-05		0	240,425
MOSAIC: Mobile Surveillance for ARI and ILI in the Community	93.283	5U01IP000618-05		0	-155
				\$0	\$240,270
Nurse Education, Practice Quality and Retention Grants					
Nurse Education, Practice, Quality, and Retention Interprofessional Collborative Practice	93.359	6UD7HP29872 02 04		0	518,444
Nurse Education, Practice, Quality, and Retention Interprofessional Collborative Practice	93.359	6UD7HP29872 02 04		3,024	21,180
				\$3,024	\$539,624
CDC Undergraduate Public Health Scholars Program (CUPS): A Public Health to Public Health and the Public Health Professions	Experience	e to Expose Undergradu	ates Interested in Minority Health		
CDC Undergraduate Public Health Scholars Program	93.456	5NU50MN000003-02-00		0	476,691
CDC Undergraduate Public Health Scholars Program	93.456	5NU50MN000003-02-00		0	241,739
				\$0	\$718,430
Public Health Training Centers Program					
PUBLIC HEALTH TRAINING CENTERS - AFFORDABLE CARE ACT (ACA)	93.516	5UB6HP31686-02-00		197,817	537,996

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
				\$197,817	\$554,348
Health Care Innovation Awards (HCIA)					
MySmileBuddy: Demonstrating the Value of Technology-assisted Non-surgical Caries Management in Young Childre	n 93.610	1C1CMS331347-02-00		0	1,947
				\$0	\$1,947
Social Services Research and Demonstration					
Examining the Impact of Policy Changes on Child Care Subsidy Receipt and Child Care Stability among Low-Income Families with Young Children in Illinois	93.647	90PD0274-05-02		0	78,083
Examining the Impact of Policy Changes on Child Care Subsidy Receipt and Child Care Stability among Low-Income Families with Young Children in Illinois	93.647	90PD0274-05-02		0	-44
				\$0	\$78,039
Ryan White HIV/AIDS Dental Reimbursement and Community Based Dental	Partnership (	Grants			
Ongoing and Updated Dental Training and Service for HIV/AIDS Populations	93.924	2H65HA00014 -17 -00		124,662	338,365
Ryan White HIV/AIDS Dental Reimbursement Program	93.924	1T22HA32262 01 00		0	105,211
				\$124,662	\$443,576
Cooperative Agreements to Support State-Based Safe Motherhood and Infa	nt Health Initi	iative Programs			
Male Teen Pregnancy Prevention Project (Male TPP Project)	93.946	5U01DP006109-03		0	194,235
				\$0	\$194,235
Primary Care Medicine and Dentistry Clinician Educator Career Developmen	nt Awards				
Primary Care Medicine and Dentistry Clinician Educator Career Development Program		41/00/11/200044 04 00		0	445 700
Primary Care Medicine and Dentistry Clinician Educator Career Development Program	93.976	1K02HP30811 01 00			115,703
Primary Care medicine and Dentistry Clinician Educator Career Development Program	93.976	1K02HP30811 01 00		0	13,634
				\$0	\$129,337
Sexually Transmitted Diseases (STD) Prevention and Control Grants					
Region II PTC	93.977	6NU62PS924513-03-03		0	502,199
				\$0	\$502,199

5 1 10 1 /B # 10 1					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Total Direct Award Programs				\$1,302,214	\$12,126,143
Pass-through Awards					
Biomedical Advanced Research and Development Authority					
Biodosimetry After Radiologic and Nuclear Events	93	ASELL PO 20170003.	PO 20170003	0	561,591
Centers for Disease Control and Prevention/DHHS					
Tuberculosis Trials Consortium	93	DVAMC CU16-2550	15FED1511233-0003	0	486,988
The Epidemiology of Novel Influenza Virus Infection and Evaluation of Antiviral and Vaccine Effectiveness	93	ABTAI 44717-44925	HHSD20002013M53890B/200-2013-F	0	12,007
The Epidemiology of Novel Influenza Virus Infection and Evaluation of Antiviral and Vaccine Effectiveness	93	ABTAI 44717-44924	GS-10F0086K/BPA 200-2013-M-538	0	10,362
Targeted Mailing Pilot Intervention to Promote Arsenic Testing of High Risk Wells (Phase 2)	93	NJDEP CU18-0960	CDC CU18-0960	0	6,805
Pandemic Influenza Study TASK ORDER NO. 50345	93	ABTAI 50345	HHSD20002013M53890B/200-2013-F	0	2,713
Arsenic Testing Outreach to Hunterdon County Families with Pregnancies and Young Children through Healthcare Providers	93	NJDEP CU18-0958	CDC CU18-0958	0	709
Department of Health & Human Services					
Alternative Dosing of Exemestane in Postmenopausal Women with Stage 0-II ER-Positive Breast Cancer a Randomized Presurgical Trial	93	UTMDA 00004054	HHSN261201200034I	0	25,435
Alternative Dosing of Exemestane in Postmenopausal Women with Stage 0-II ER-Positive Breast Cancer a Randomized Presurgical Trial	93	UTMDA 00004054	HHSN261201200034I	0	21,808
Food & Drug Administration					
Queries and Epidemiologic Studies	93	IQVIA-Columbia-100231	HHSF223201810023I	0	374,481
FDA BEST: Develop New, Innovative Methods for Automation of Blood Product Adverse Event Reporting	93	2017-IMS-SC-C002	HHSF223201750070A	0	77,845
FDA BEST: Blood and Blood Product Safety Surveillance	93	2017-IMS-SC-C001	HHSF223201750065A	0	71,629
Health Resources and Services Administration/DHHS					
HRSA TO6-Evidence Review Group Member	93	DUKEU CU18-4137	HHSH25034006T	0	9,464

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
MCHB HRSA T05	93	DUKE A030562	HHSH2502015000021	0	(Includes Subrecipients) 4,732
National Center for Infectious Disease/CDC/DHHS					
CONNECT Revised: Relationship-Based HIV prevention (CRRHP)	93	DANYA 3597	CDC	0	1,970
				\$0	\$1,668,545
Special Programs for the Aging, Title IV, and Title II, Discretionary Proj	ects				
Addressing Oral Health and Effectiveness of Home Delivered Meals	93.048	LIVEON CU17-2560	90INNU0004-01-00	0	37,204
Addressing Oral Health and Effectiveness of Home Delivered Meals	93.048	LIVEON CU17-2560	90INNU0004-01-00	0	12,436
				\$0	\$49,640
Chronic Diseases: Research, Control, and Prevention					
RENYC, Rare epilepsies in New York City: Epidemiology and health outcomes	93.068	CUMC 15081290-02	1U01DP006089-01	0	21,270
				\$0	\$21,270
Public Health Emergency Preparedness					
Emergency Response Group Assessment Pilot Project (OEPR 20/RD 1)	93.069	PUBHS 17-CU-02	NU90TP921922	0	
				\$0	\$-1
Prevention of Disease, Disability, and Death by Infectious Diseases					
Northeast Regional Center for Excellence in Vector Borne Diseases	93.084	CU 81477-10822	6U01CK000509-01-04	0	173,604
Northeast Regional Center for Excellence in Vector Borne Diseases	93.084	CU 81477-10822	6U01CK000509-01-04	0	43,792
				\$0	\$217,396
Food and Drug Administration Research					
Phase 3 Trial of DCA in PDC Deficiency IND 028,625(02/04/15)	93.103	UFOCR00012069	1R01FD005407-01	0	68,689
I-ACT for children, Global Pediatrics Clinical Trials Network	93.103	IACT CU18-2768	1U18FD006297-01	0	158

·					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures (Includes Subrecipients)
				\$0	\$68,844
Centers for Research and Demonstration for Health Promotion and Disease	e Prevention				
Healthy Youth Development Prevention Research Center - SIP07-005	93.135	UMINN N006894501	3U48DP005022-04S5	0	54,436
Healthy Youth Development Prevention Research Center - SIP07-005	93.135	UMINN N006894501	3U48DP005022-04S5	0	19,696
				\$0	\$74,132
Injury Prevention and Control Research and State and Community Based	Programs				
Michigan Youth Violence Prevention Center (MI-YVPC) Community Engagement and Revitalization	93.136	UMICHG 3004386942	5U01CE002698-02	0	119,890
Anti-bullying laws and youth in the United States: Alongitudinal evaluation of efficacy and implementation	93.136	UMINN PO06360101	1R01CE002913-01	0	77,995
Michigan Youth Violence Prevention Center (MI-YVPC) Community Engagement and Revitalization	93.136	UMICHG 3004386942	5U01CE002698-02	0	31,191
THE PENN VIOLENCE AND INJURY CONTROL RESEARCH CENTER	93.136	UPENN 572095	5R49CE002474-03	0	12,234
				\$0	\$241,310
Research on Healthcare Costs, Quality and Outcomes					
Generalizability and Spread of an Evidenced-based Fall Prevention Toolkit: Fall TIPS (Tailoring Interventions for Patient Safety)	93.226	BWH 116930	1R18HS025128-01	0	93,731
Consumer Assessment of Healthcare Providers and Systems CAHPS V	93.226	YU GR103533 (CON-80001331)	2U18HS016978-11	0	47,259
Preventing Wrong Drug and Wrong Patient Errors with Indication Alerts in CPOE Systems	93.226	NWU SP0037488-PROJ0010282	R01HS024945	5,574	44,215
Finding the Safer Way: Novel Interaction Design Approaches to Health IT Safety	93.226	UPITT 0061498 (131173-2)	7R01HS023708-04	0	39,104
Patient Centered Fall Prevention Toolkit: Project 1	93.226	BWH 111438	5P30HS023535-02	0	34,247
Ensuring safe performance of electronic health records	93.226	BWH 111456	1R01HS023696	0	27,691
The effects of state sepsis mandates on hospital mortality, health care utilization, and costs	93.226	UPMC 00057761 (130289-1)	1R01HS025146-01A1	0	19,091
Pediatric Ambulatory Healthcare Associated Infections: Incidence Rates, Risk Factors, Outcomes, Costs and Algorithms for Detection	93.226	AECM 310939/311103	1R01HS024432-01	0	7,095

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Reducing Diagnostic Errors in Primary Care Pediatrics	93.226	AECM 310809	6R01HS023608-02	0	(Includes Subrecipients) 3,099
				\$5,574	\$315,532
Policy Research and Evaluation Grants					
Supporting the Development of the Poverty Research Center at the University of Wisconsin					
	93.239	UWIMAD 703K802	1H79AE000103-01	0	65,370
Supporting the Development of the Poverty Research Center at the University of Wisconsin	93.239	UWIMAD 703K802	1H79AE000103-01	0	37,857
Poverty among Children of Immigrants: Understanding State-Level Variation and the Impact of SNAP Policy	93.239	UWM 745K463	1H79AE000103-01	0	
				\$0	\$103,225
Substance Abuse and Mental Health Services Projects of Regional and Natio	onal Significa	nnce			
Providers Clinical Support System for Medication Assisted Treatment (PCSS-MAT) - Training and Implementation	93.243	AAAP PCSSMAT-16-5	1U79TI026556-01	0	106,397
WORTH (Women on the Road to Health) Transitions Program	93.243	ROCHSTR 417018-G/URFAO	1H79TI080055-01	0	72,874
Integrated Healthcare + Housing	93.243	P2PPA CU62310-01	1H79SM062310-01	0	33,108
Providers Clinical Support System for Medication Assisted Treatment (PCSS-MAT) - Training and Implementation	93.243	AAAP PCSSMAT-16-5	1U79Tl026556-01	0	9,863
				\$0	\$222,242
Occupational Safety and Health Program					
Prenatal WTC Chemical Exposures, Birth Outcomes and CardiometabolicRisks	93.262	NYU 108364	U01OH011299	0	178,453
Multimodal Neuroimaging of Cognitive and Emotional Networks in Young Adults Exposed to 9/11 as Children	93.262	RFMH 27019	1U01OH011694-01	0	15,483
Prenatal WTC Chemical Exposures, Birth Outcomes and CardiometabolicRisks	93.262	NYU 108364	U01OH011299	0	-7,054
				\$0	\$186,882
Centers for Disease Control and Prevention Investigations and Technical As	sistance				
Wills Eye Community Intervention to Improve Glaucoma Detection and Follow-Up Care	93.283	WILLS CDC14086	U01DP005127	0	62,532
Wills Eye Community Intervention to Improve Glaucoma Detection and Follow-Up Care	93.283	WILLS CDC14086	U01DP005127	0	19,505

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
	<u></u>			\$0	(Includes Subrecipients) \$82,037
Feenage Pregnancy Prevention Program					
Engender Health	93.297	ENGENDER PSA-655-01	5 TP2AH000001-02-00	0	-49,179
				\$0	\$-49,179
Sickle Cell Treatment Demonstration Program					
Northeast Region Sickle Cell Disease Treatment Demonstration Regional Collaborative Program	93.365	JH 2003735144	2U1EMC227864-04-00	0	51,933
				\$0	\$51,933
CL National Institute on Disability, Independent Living, and Rehabilitation	Research				
RERC on TECH. for the Deaf and Hard of Hearing	93.433	GU #25172	90RE5020-02-01	0	72
				\$0	\$72
ADMINISTRATION FOR COMMUNITY LIVING					
Addressing Barriers to Quality Dental Care for Individuals with Developmental Disabilities	93.630	NJCDD 03ZZ19R	1801NJBSDD	0	74,454
				\$0	\$74,454
Opioid STR					
FY 2018 Opioid State Targeted Response Technical Assistance (STR TA)	93.788	AAAP States 16-2	1H79TI080816-01	0	39,672
FY 2018 Opioid State Targeted Response Technical Assistance (STR TA)	93.788	AAAP States 16-2	1H79TI080816-01	0	31,115
FY 2018 Opioid State Targeted Response Technical Assistance (STR TA)	93.788	AAAP States 16-2	1H79TI080816-01	0	26,187
				\$0	\$96,974
National Bioterrorism Hospital Preparedness Program					
Performance Measure and Dashboard Development for NYC Healthcare System (HPP 44)	93.889	PUBHS 17-CU-01	NU90TP921922	0	43,110
Performance Measure and Dashboard Development for NYC Healthcare System (HPP 44)	93.889	PUBHS 17-CU-01	NU90TP921922	0	-3,242
				\$0	\$39,868

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
HIV Emergency Relief Project Grants					
RYAN WHITE PART A CONTRACT 93-EVL-4645 FOR PLANNING AND EVALUATION (BASE)	93.914	93-EVL-4645	H89HA00015	0	604,035
RYAN WHITE PART A CONTRACT 93-EVL-4645 FOR PLANNING AND EVALUATION (BASE)	93.914	93-EVL-4645	H89HA00015	0	-1,318
				\$0	\$602,716
Total Pass-through Programs				\$5,574	\$4,067,892
Total: Department of Health & Human Services (Excluding NIH)				\$1,307,788	\$16,194,035
National Institute of Health					
Direct Awards					
Fogarty International Center/NIH/DHHS					
Building capacity to evaluate clean cooking in Ecuador	93	FIC CU18-2281		0	23,071
National Cancer Institute/NIH/DHHS					
Large-scale research on clinical data for treatment pathways in cancer patients	93	HHSN261201700469P		0	19,350
National Institute of Allergy and Infectious Diseases/NIH/DHHS					
High throughput biodosimetry using a fully automated dicentric assay on commercial high content screening platforms.	93	HHSN272201600040C		66,632	523,436
National Institute of Child Health and Human Development/NIH/DHHS					
A Multi-Center, Randomized Study to Evaluate the Pharmacokinetic and Pharmacodynamic Profile, Contraceptive Efficacy and Safety of Daily Oral Low Dose Ulipristal Acetate	93	HHSN2752013000101		155,392	443,046
Clinical Evaluation of Long-Acting Reversible Contraceptives	93	HHSN275201300010I		0	174,708
A Multicenter, Open Label Randomized Study on the Efficacy, Cycle Control and Safety of a Contraceptive Vaginal Ring Delivering a Daily Dose of Nestorone and Estradiol (NES E2 CVR)	93	HHSN275201400010I		0	163,693
A Multi-Center, Randomized Study to Evaluate the Pharmacokinetic and Pharmacodynamic Profile, Contraceptive Efficacy and Safety of Daily Oral Low Dose Ulipristal Acetate	93	HHSN2752013000101		0	12,755
Parallel Group Study to Evaluate Patches containing Different Doses of Levonorgrdytrl(LNG) Patch Study	93	HHSN275201000019U		0	-1,574
				\$222,024	\$1,358,486

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Family Smoking Prevention and Tobacco Control Act Regulatory Research					
Tracking Metals From E-cigarettes: From The Coil Into Lung Tissue	93.077	5R21ES029777-02		0	195,912
Ventilation and Pulmonary Endothelium Toxicities (VaPE-Tox) of E-cigarettes: A Randomized Crossover Pilot Study	93.077	5R03HL132590-02		0	39,349
				\$0	\$235,261
Environmental Health					
Circulating microRNAs in Extracellular Vesicles, Air Particulate Pollution, and Lung Function in an Aging Cohort	93.113	5R01ES025225-05		601,453	858,697
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		61,025	594,990
Low-level Arsenic Exposure and Cardiovascular Disease in Multi-Ethnic Adults (MESA As)	93.113	5R01ES028758-02		35,959	548,844
Arsenic Exposure, Impaired Respiratory Function, and Immunosuppression	93.113	5R01ES023888-04		267,621	455,266
Understanding Adoption of Clean Cookstoves	93.113	5R01ES024489-05		209,845	449,714
Arsenic, Epigenetics and Incident Cardiovascular Disease in American Indian Communities	93.113	5R01ES025216-05		244,046	443,372
Prenatal Factors in Autism and Other Psychiatric Outcomes in a National Birth Cohort	93.113	5R01ES028125-03		120,378	414,411
Effects of Flame Retardants on brain function and attentional deficits in school-age children brain imaging, neurobehavioral, and gut microbiome studies in a longitudinal birth cohort	93.113	5R01ES027845-02		168,730	408,542
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		0	362,487
Principal Component Pursuit to Assess Exposure to Environmental Mixtures in Epidemiologic Studies	93.113	5R01ES028805-02		0	336,932
Child Lung Development Following a Cookstove Intervention: Evidence from GRAPHS	93.113	5R01ES026991-03		218,601	319,141
Potential Inhaled Dose of Particulates, Biking and Cardiovascular Indicators	93.113	5R33ES024734-05		46,269	282,834
Interdisciplinary Training in Climate and Health	93.113	5T32ES023770-05		0	274,806
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	266,045
Training Program in Environmental Life Course Epidemiology	93.113	5T32ES023772-05		0	264,318

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
DNA Repair Phenotype the Missing Link in Breast Cancer Risk Assessment	93.113	5U01ES029660-02		47,498	257,629
Pre- and Postnatal PBDE Exposure, Thyroid Hormones, and Neurodevelopment	93.113	4R01ES021806-05		0	251,973
Early Exposure to Persistent Organic Pollutants, Breast Milk Extracellular Vesicles and Abnormal Cardiometabolic Programming	93.113	5R21ES027087-02		7,547	250,608
Prenatal pyrethroid exposure and child mental, motor and behavioral development	93.113	4R01ES021482-04		0	238,256
Molecular and Epigenetic Mitochondriomics of Air Particles, Lead and Cognition	93.113	7R01ES021733-05		0	220,506
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	215,781
Multiparametric: Prediction of Vasospasm after Subarachnoid Hemorrhage	93.113	5K01ES026833-05		0	208,115
Potential Inhaled Dose of Particulates, Biking and Cardiovascular Indicators	93.113	5R33ES024734-05		0	177,178
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	163,037
Interdisciplinary Training in Environmental Health	93.113	5T32ES007322-18		0	160,022
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	157,418
DNA Repair Phenotype the Missing Link in Breast Cancer Risk Assessment	93.113	5U01ES029660-02		0	155,808
BPA, Phthalates & Stress: Mechanisms and Interactions for Childhood Obesity	93.113	7R01ES021357-05		128,694	148,318
Effects of Prenatal Exposure To Environmental Tobacco Smoke on Brain Function and Academic Skills	93.113	5K23ES026239-04		0	142,155
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		60,774	138,429
Brain-Derived Extracellular Vesicles as a Novel Source of Biomarkers for Disease Progression and Environmental Exposure in ALS	93.113	1R56S029971-01		0	134,690
Air Pollution Exposure and Risk of Amyotrophic Lateral Sclerosis (ALS)	93.113	5R21ES028472-02		44,641	127,559
Supplement (S1)	93.113	5P50ES009600-19		127,535	127,535
Supplement (S1)	93.113	5P50ES009600-19		0	124,690
Supplement (S1)	93.113	5P50ES009600-19		0	119,250

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Supplement (S1)	93.113	5P50ES009600-19		0	114,977
Undergraduate Research Program to Promote Diversity in EHS	93.113	5R25ES025505-05		11,886	107,202
À DATA SCIENCE APPROACH TO AIR TOXICS AND CHILDREN'S ENVIRONMENTAL HEALTH	93.113	5R00ES027022-04		0	107,083
Brain and Behavioral Indicators of Risk for Parkinsonism among Adolescents with Early Pesticide Exposure	93.113	1R01ES030039-01		0	94,695
Vesicular Modulation of Dopamine Neuron Toxicity	93.113	7R01ES023839-05		0	86,418
Potential Inhaled Dose of Particulates, Biking and Cardiovascular Indicators	93.113	5R33ES024734-05		45,221	85,164
Supplement (S1)	93.113	5P50ES009600-19		0	69,974
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	66,210
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	64,965
Rad52-dependent recombination in response to replication stress	93.113	1R21ES030447-01		0	63,926
Principal Component Pursuit to Assess Exposure to Environmental Mixtures in Epidemiologic Studies	93.113	5R01ES028805-02		0	60,958
Supplement (S1)	93.113	5P50ES009600-19		40,013	55,013
Flame retardants, thyroid function, and psychomotor skills in children	93.113	7R21ES024841-02		11,866	54,584
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		36,926	52,857
Child Lung Development Following a Cookstove Intervention: Evidence from GRAPHS	93.113	5R01ES026991-03		0	51,652
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	44,843
Prenatal Factors and Risk of Autism in a Finnish National Birth Cohort	93.113	5R01ES019004-05		0	44,833
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	43,538
Supplement (S1)	93.113	5P50ES009600-19		0	41,116
Supplement (S1)	93.113	5P50ES009600-19		40,233	40,233

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	40,000
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	39,990
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	34,544
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	32,567
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		20,000	32,000
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	32,000
Potential Inhaled Dose of Particulates, Biking and Cardiovascular Indicators	93.113	5R33ES024734-05		0	29,279
BPA, Phthalates & Stress: Mechanisms and Interactions for Childhood Obesity	93.113	7R01ES021357-05		0	28,518
Understanding Adoption of Clean Cookstoves	93.113	5R01ES024489-05		0	27,893
Effects of Arsenic Exposure on 5-methylcytosine and 5-hydroxymethylcytosine, and Effect Modification by Nutritional Status	93.113	5F31ES029019-02		0	25,252
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		17,552	25,193
Assessing Current and Future Health Impacts of Fine Particulate Matter in China and the United States	93.113	5F31ES029372-02		0	25,095
Arsenic Exposure in US Drinking Water: Spatial Patterns, Temporal Trends, and Related Mortalities	93.113	5F31ES029799-02		0	25,095
Telomere Dynamics as Indicators of Social Adversity in Environmental Epidemiology	93.113	5R03ES026416-02		0	20,479
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		0	18,740
Potential Inhaled Dose of Particulates, Biking and Cardiovascular Indicators	93.113	5R33ES024734-05		0	16,960
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	16,193
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	16,000
Effect of Early-Life Exposure to Metal Mixtures on Lung Function and Mitochondrial DNA in Children	93.113	1R01ES029974-01		0	15,756
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	15,529

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	(Includes Subrecipients) 14,845
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	13,630
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	12,893
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	12,093
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	10,359
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	10,300
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	9,645
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	7,112
Effects of Arsenic Exposure on 5-methylcytosine and 5-hydroxymethylcytosine, and Effect Modification by Nutritional Status	93.113	5F31ES029019-02		0	6,651
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	6,054
Complex Mixtures of Endocrine Disrupting Chemicals in Relation to Cognitive Development	93.113	1F31ES030263-01		0	5,884
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	5,185
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	4,678
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	3,453
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	3,187
Supplement (S1)	93.113	5P50ES009600-19		0	3,175
Interdisciplinary Training in Climate and Health	93.113	5T32ES023770-05		0	2,263
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	2,148
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	2,115
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	1,450

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Supplement (S1)	93.113	5P50ES009600-19		0	1,386
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	1,279
Supplement (S1)	93.113	5P50ES009600-19		0	1,150
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	879
Supplement (S1)	93.113	5P50ES009600-19		0	862
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	768
Air Pollution and Risk of Placental Abruption in New York City	93.113	5R21ES025845-02		0	696
Training Program in Environmental Life Course Epidemiology	93.113	5T32ES023772-05		0	454
Center for Environmental Health in Northern Manhattan	93.113	5P30ES009089-21		0	400
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		0	-58
Supplement (S1)	93.113	5P50ES009600-19		0	-106
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		0	-165
Potential inhaled dose of particulates, biking and cardiovascular indicators	93.113	5R21ES024734-02		-256	-256
Pregnancy and Prenatal PAHs and other Environmental Exposures and Breast Cancer	93.113	5U01ES026122-05		0	-351
Interdisciplinary Training in Environmental Health	93.113	5T32ES007322-18		0	-4,430
				\$2,614,057	\$11,806,308
Oral Diseases and Disorders Research					
A Neuronal Basis for the Osteocalcin Regulation of Bone Mass	93.121	5R01DE027887-02		0	352,334
MicroRNA-based prognostic model for early-stage oral cancer patients	93.121	5R01DE026801-03		0	291,894
Craniofacial Tissue Engineering	93.121	5R01DE016525-10		212,415	254,870

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Randomized Efficacy Trial of MySmileBuddy, a Family-centered Behavioral Intervention to Reduce Early Childhood Caries	93.121	1U01DE026739-01A1		0	(Includes Subrecipients) 254,131
NIDCR Dentist Scientist K99:Improve TMJ Fibrocartilage Regeneration Strategies	93.121	5R00DE022060-06		0	230,162
Oral immune activation and alveolar bone loss in HIV-infected postmenopausal women	93.121	5R01DE026924-03		7,353	208,627
Oral microbial signatures in perinatal HIV infection	93.121	5R01DE028135-02		0	147,170
TMJ Disc Regeneration by 3D-Printed Bioscaffolds in a Pre-Clinical Animal Model	93.121	5R03DE026794-02		0	123,488
Genomic approaches to the pathobiology and classification of periodontitis	93.121	5R03DE024735-02		0	119,931
Oral immune activation and alveolar bone loss in HIV-infected postmenopausal women	93.121	5R01DE026924-03		0	118,276
A combined genetic/epigenetic approach to study periodontitis susceptibility and pathobiology	93.121	1R56DE026487-01A1		0	105,710
Multivariate analysis of microbial absolute abundance in population-based studies.	93.121	5R03DE027773-02		32,043	98,661
Continuous root formation in developing teeth by molecular cues	93.121	5R01DE025643-03		0	9,537
A combined genetic/epigenetic approach to study periodontitis susceptibility and pathobiology	93.121	1R56DE026487-01A1		0	6,617
Oral immune activation and alveolar bone loss in HIV-infected postmenopausal women	93.121	5R01DE026924-03		0	3,936
Pre-clinical Models of Odontic Analogs by Endogenous Stem Cells	93.121	5R01DE023112-04		0	1,032
Mechanism of F. Nucleatum in Intrauterine Infection	93.121	5R01DE023332-04		0	250
				\$251,811	\$2,326,626
NIEHS Superfund Hazardous Substances Basic Research and Education					
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		271,853	271,853
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	196,608
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		47,689	161,295
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		57,560	109,426

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		12,022	109,099
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		6,000	104,730
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	85,309
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	61,722
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	57,445
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	45,783
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	33,409
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		32,728	32,728
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	32,301
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	31,329
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	25,594
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	16,968
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	16,346
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	13,306
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		1,080	9,140
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	9,094
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	3,556
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	2,387
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	2,199
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	910

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Health Effects and Geochemistry of Arsenic	93.143	5P42ES010349-18		0	<del>(monages captes)piones</del> ,
				\$428,932	\$1,432,594
Human Genome Research					
Columbia GENIE (GENomic Integration with Ehr)	93.172	5U01HG008680-04		0	831,426
Center for Research on Ethical, Legal & Social Implications of Psychiatric, Neurologic & Behavioral Genetics	93.172	5RM1HG007257-07		101,309	666,891
Inferring gene regulatory circuitry from functional genomics data	93.172	5R01HG003008-14		118,736	618,831
Massively parallel mapping of all molecular interactions in a single tube	93.172	5R01HG009065-05		0	571,427
Development of recommendations and policies for genetic variant reclassification	93.172	5R01HG010365-02		92,204	555,777
Single Molecule Real Time Electronic Sequencing	93.172	5R01HG006882-04		55,427	429,621
Develop quantile analysis tools for sequencing and eQTL studies	93.172	5R01HG008980-04		0	338,433
Comprehensive Single Molecule Enhanced Detection of Modified Cytosines in Mammalian Genomes	93.172	5R21HG009187-02		0	190,598
Center for Research on Ethical, Legal and Social Implications of Psychiatric, Neurologic and Behavioral Genetics	93.172	5P50HG007257-05		82,889	149,85
The Ethics of Inclusion: Diversity in Precision Medicine Research	93.172	5R01HG010330-03		0	94,90
: CLIP Tool Kit (CTK): pipeline, user interface and tutorials for CLIP data analysis	93.172	5R03HG009528-02		0	71,656
Center for Research on Ethical, Legal and Social Implications of Psychiatric, Neurologic and Behavioral Genetics	93.172	5P50HG007257-05		0	67,048
Comprehensive Single Molecule Enhanced Detection of Modified Cytosines in Mammalian Genomes	93.172	5R21HG009187-02		0	63,012
Enzyme-less DNA base discrimination using solid-state nanopores with highfrequency integrated detection electronics	93.172	5R01HG009189-03		42,034	44,182
Columbia GENIE (GENomic Integration with Ehr)	93.172	5U01HG008680-04		0	43,405
Novel approaches to map DNA replication traffic in a genome-wide scale	93.172	1R21HG010165-01A1		0	40,902
Columbia GENIE (GENomic Integration with Ehr)	93.172	5U01HG008680-04		0	34,954

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
The Ethics of Inclusion: Conceptualizing Diversity in Genomics Research	93.172	5R03HG010178-03		0	30,913
Columbia GENIE (GENomic Integration with Ehr)	93.172	5U01HG008680-04		0	-8,340
				\$492,599	\$4,835,485
Research Related to Deafness and Communication Disorders					
Integrative Structural and Functional Characterization of Tip-Link Cadherins Deafness	93.173	5R01DC016960-02		585,031	933,358
Deciphering the molecular principles of olfactory receptor gene choice	93.173	5R01DC015451-04		0	609,158
Auditory Mechanics and Cochlear Amplification	93.173	5R01DC015362-04		0	434,852
Mechanisms for cancelling self-generated sounds in the mouse dorsal cochlear nucleus	93.173	5R01DC015449-04		0	400,355
The Unfolded Protein Response as an Organizer of Chemosensory Response	93.173	5R01DC014144-05		0	392,454
Intracochlear Delivery of Therapeutics Across RWM via Microneedle Array	93.173	5R01DC014547-05		0	295,639
Neurophysiology of robust speech perception in human superior temporal gyrus	93.173	5R01DC014279-05		0	265,732
The Unfolded Protein Response as an Organizer of Chemosensory Response	93.173	5R01DC014144-05		0	259,894
Neural Coding and Perception of Learned Vocalizations	93.173	5R01DC009810-09		0	244,789
Understanding the Role of Nuclear Architecture in Olfactory Receptor Choice	93.173	5R01DC013560-05		0	203,007
A Medicinal Chemistry Approach to Understanding the Basis of Olfactory Perception	93.173	5R01DC013553-05		0	169,230
Intracochlear Delivery of Therapeutics Across RWM via Microneedle Array	93.173	5R01DC014547-05		0	113,339
Auditory Mechanics and Cochlear Amplification	93.173	5R01DC015362-04		0	62,152
Developmentally dynamic chromatin architecture during neurogenesis	93.173	5F31DC016785-03		0	45,920
Circuit Mechanisms for the Cancellation of Self-Generated Sounds in the Dorsal Cochlear Nucleus	93.173	5F31DC016816-03		0	44,524
Translational control of sensory identity	93.173	1R21DC017823-01		0	35,825

Federal Grantor / Pass-through Grantor	OFDA	Designat No.	Dana thannah Onatanat Nivashan	0.1	R&D Cluster
-edetal Grantor / Fass-tinough Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Mechanisms for invariance in auditory cortex: Investigations with marmoset electrophysiology	93.173	1F32DC017628-01		0	22,00
				\$585,031	\$4,532,230
Research and Training in Complementary and Integrative Health					
Ginger s therapeutic potential in asthma	93.213	5R61AT009989-02		0	38,03
Ginger s therapeutic potential in asthma	93.213	5R61AT009989-02		0	25,157
Acupuncture of Armotase Inhibitor Related Arthralgias in Breast Cancer Patients	93.213	5R01AT006376-05		0	8,015
				\$0	\$71,205
National Center on Sleep Disorders Research					
Vascular Endothelial Activation in Sleep Apnea	93.233	5R01HL106041-08		0	591,219
Effect of long-term sleep restriction on energy balance	93.233	5R01HL128226-04		41,983	571,535
Poor Sleep, Sedentary Behavior, and Secondary Cardiovascular Risk in Stroke and TIA Patients	93.233	5R01HL141494-02		0	469,379
Poor Sleep, Sedentary Behavior, and Secondary Cardiovascular Risk in Stroke and TIA Patients	93.233	5R01HL141494-02		0	161,658
Effect of long-term sleep restriction on energy balance	93.233	5R01HL128226-04		0	34,18
Effect of long-term sleep restriction on energy balance	93.233	5R01HL128226-04		0	11,048
Nocturnal Hypertension and Śleep	93.233	1K23HL141682-01A1		0	7,510
Nocturnal Hypertension and Sleep	93.233	1K23HL141682-01A1		0	12′
				\$41,983	\$1,846,651
Mental Health Research Grants					
Neurobiology and dynamics of Active Sensing	93.242	5P50MH109429-03		1,235,281	1,497,060
Zero Suicide Implementation and Evaluation in Outpatient Mental Health Clinics					

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Predicting Heterogeneous Neurodevelopmental Outcomes in School-age Children with Early Caregiving Adversities	93.242	5R01MH091864-08		80,399	(Includes Subrecipients) 769,049
Neurophysiology underlying neural representations of value	93.242	5R01MH082017-13		0	718,970
e-Connect: a service system intervention for justice youth at risk for suicide	93.242	5R01MH113599-03		204,245	663,49
Neurobiological Underpinnings of Two Suicidal Subtypes	93.242	5R01MH109326-04		74,210	609,542
Structural Stigma and HIV Prevention Outcomes	93.242	5R01MH112384-03		226,077	597,503
Glutamate reducing interventions in schizophrenia	93.242	5R61MH112800-02		299,819	588,910
Decoding the neural basis of resting-state functional connectivity mapping	93.242	1RF1MH114276-01		0	550,362
Training in Schizophrenia and Psychotic Disorders: From Animal Models to Patients	93.242	5T32MH018870-32		0	522,369
A Trial of Opening Doors to Recovery for Persons with Serious Mental Illnesses	93.242	5R01MH101307-06		354,810	513,19
The role of the hippocampal CA2 region in neuropsychiatric disease	93.242	5R01MH106629-04		0	480,00
Identifying treatment targets: exploring and exploiting neural mechanisms of cognitive deficits in the 22q11.2 microdeletion	93.242	5R01MH096274-07		0	474,97
Focused ultrasound for noninvasive brain stimulation	93.242	5R01MH112142-03		0	451,062
MicroRNA Dysregulation in Pyschiatric Disorders and Cognitive Dysfunction	93.242	5R01MH097879-08		113,448	448,54
Cellular and humoral immune mechanisms underlying neurovascular dysfunction in autoimmune encephalitis	93.242	5R01MH112849-03		111,572	441,629
The role of the locus coeruleus in mediating pupil-linked arousal	93.242	5R01MH112267-03		0	433,496
Deciphering the role of histone methyltransfe	93.242	5R01MH112860-03		0	432,014
Functional mapping of arginine vasopressin receptor 1A circuits thatpromote anorexic behavior	93.242	5R01MH113353-02		0	431,870
Role of the protocadherin alpha gene cluster in serotonergic circuitry formation and its implications in depressive disorders	93.242	5R01MH108579-04		0	417,488
Behavioral Sciences Research in HIV Infection	93.242	5T32MH019139-30		0	414,859
The Role of Place and Grid Cells in Human Spatial navigation and Memory	93.242	5R01MH104606-05		67,651	393,98

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Translational Research Training in Child Psychiatry	93.242	5T32MH016434-40		0	(Includes Subrecipients) 377,448
Research Training in Mood and Anxiety Disorders: From Animal Models to Patients	93.242	5T32MH015144-41		0	370,322
A Comparative Approach for Decomposing the Mammalian Brain Architectural Complexity	93.242	1DP2MH119423-01		0	360,639
Research Training Program in Psychiatric Epidemiology	93.242	5T32MH013043-48		0	343,788
Implicit serial learning in monkeys and humans	93.242	5R01MH111703-02		0	341,446
mLab App for Improving Uptake of rapid HIV self-testing and Linking Youth to Care	93.242	5R01MH118151-02		94,827	337,507
A Trial of a Police Mental Health Linkage System for Jail Diversion and Reconnection to Care	93.242	5R01MH117191-02		14,273	323,110
Functional analysis of the 22q11.2 schizophrenia susceptibility genes	93.242	5R01MH067068-15		0	314,843
The structural basis of cis and trans protocadherin interactions	93.242	5R01MH114817-07		0	307,978
1/3-Identifying regulatory mutations that influence neuropsychiatric disease	93.242	5U01MH105670-05		49,917	301,134
Novel Methods for Evaluation and Implementation of Behavioral Intervention Technologies for Depression	93.242	5R01MH109496-04		135,668	292,769
Mitochondrial Regulation of Stress Reactivity in Humans	93.242	5R21MH113011-02		0	266,167
Genetic targeting of hippocampal CA2 pyramidal neurons	93.242	5R01MH104602-05		0	262,132
Intergenerational Transmission of deficits in Self-Regulatory Control	93.242	5R01MH117983-02		113,895	244,659
Integrative methods for the identification of causal variants in mental disorder	93.242	5R01MH106910-03		10,333	239,621
Discovery of small molecule cofactors of neurotrophin BDNF	93.242	5R21MH116275-02		49,339	234,792
Exploring the pathophysiology of anxiety: the role of the hippocampus, amygdala and medial prefrontal cortex	93.242	5R01MH081968-10		0	211,790
Novel Statistical methods for DNA Sequencing Data, and applications to Autism	93.242	5R01MH095797-06		24,757	204,849
Research Training in Late-Life Neuropsychiatric Disorders	93.242	5T32MH020004-20		0	201,734
Development of fluorescent false neurotransmitters	93.242	5R01MH108186-05		0	184,073

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Serotonin 1A Receptor PET Imaging and SSRI Outcome in Bipolar Depression	93.242	5K23MH105688-05		0	183,756
Vitamin-D- PRODH- &DTNBP1-Induced Hyperprolinemia:Schizophrenia Risk & Treatment	93.242	5R01MH100219-05		46,498	177,625
IPrEP: A Combination Strategy for HIV Prevention among Young Female Sex Workers, Kisumu, Kenya	93.242	5R01MH110051-04		153,661	169,502
Brain stimulation for cognitive enhancement based on modulation of cortical traveling waves	93.242	5R21MH117682-02		0	168,489
Identifying de novo mutations causing OCD in trios by whole exome sequencing	93.242	5R01MH099216-06		17,470	163,066
tDCS Augmentation of Cognitive Remediation in Schizophrenia	93.242	5R33MH099265-05		74,255	159,181
Predicting Internet-Based Treatment Response for Major Depression Disorder	93.242	7R56MH109566-03		0	153,676
1/3 - Genomics of Schizophrenia in the South Africa Xhosa	93.242	5U01MH096756-05		0	149,783
Stigma Associated with a High-Risk State for Psychosis among Adolescents and Young Adults: Impacts on Identity and Social Integration	93.242	4R01MH096027-05		120,398	148,605
The structural basis of cis and trans protocadherin interactions	93.242	5R01MH114817-07		0	147,528
Neurobiology and dynamics of Active Sensing	93.242	5P50MH109429-03		141,352	141,352
Early Adversity and Human Microbiome-Hippocampal Development: Anxiety Associations	93.242	5K99MH113821-02		0	140,384
Genetic targeting of hippocampal CA2 pyramidal neurons	93.242	2R01MH104602-06		0	136,396
Translational Neuroscience Training Grant	93.242	5T32MH015174-43		0	129,111
Research Training in Biobehavioral Disturbances of Eating Disorders	93.242	5T32MH096679-07		0	126,241
Identification of Rare Variants of OCD	93.242	5R01MH097971-06		0	119,288
IPrEP: A Combination Strategy for HIV Prevention among Young Female Sex Workers, Kisumu, Kenya	93.242	5R01MH110051-04		34,007	117,266
Building Schizophrenia Research in Macedonia	93.242	4R01MH098786-05		41,284	116,024
Building Multistage Treatment Regimens for Depression after Acute Coronary Syndrome	93.242	5R21MH108999-02		0	113,318
Neurobiology and dynamics of Active Sensing	93.242	5P50MH109429-03		0	111,114

For year ended June 30, 2019

Eederal Grantor / Pass-through Grantor         CFDA         Project No         Pass-through Contract Number         Subrecipients           Integrative Learning to Combine Evidence for Personalized Treatment Strategies         93.242         5R21MH117458-02         0           HIV Intervention Science Training Program for Underrepresented Investigators         93.242         5R25MH080665-10         0           Hippocampal inhibitory control of contextual fear learning         93.242         5R01MH100631-05         0           Statistical methods for the assessment of social engagement in psychosis using digital technologies         93.242         5R01MH11847-02         0           Implicit serial learning in monkeys and humans         93.242         5R01MH111703-02         0         29.533           Negative Symptoms in Clinical High Risk and First Episode Psychiatric Illness: Investigation of a New Candidate for Targeted Treatment.         93.242         5R21MH116515-02         29.533           The interactive roles of the amygdala and orbitofrontal cortex during reversal learning         93.242         1R21MH116348-01A1         0	Total Expenditures ncludes Subrecipients)  109,709  108,048  107,349  106,345
Integrative Learning to Combine Evidence for Personalized Treatment Strategies  93.242 5R21MH117458-02  0  HIV Intervention Science Training Program for Underrepresented Investigators  93.242 5R25MH080665-10  0  Hippocampal inhibitory control of contextual fear learning  93.242 5R01MH100631-05  0  Statistical methods for the assessment of social engagement in psychosis using digital technologies  93.242 5K01MH118477-02  0  Implicit serial learning in monkeys and humans  93.242 5R01MH111703-02  0  Negative Symptoms in Clinical High Risk and First Episode Psychiatric Illness: Investigation of a New Candidate for Targeted Treatment.  93.242 5R21MH116515-02  29.533	109,709 108,048 107,349 106,345
Hippocampal inhibitory control of contextual fear learning 93.242 5R01MH100631-05 0 Statistical methods for the assessment of social engagement in psychosis using digital technologies 93.242 5K01MH118477-02 0 Implicit serial learning in monkeys and humans 93.242 5K01MH118477-02 0 Negative Symptoms in Clinical High Risk and First Episode Psychiatric Illness: Investigation of a New Candidate for Targeted Treatment. 93.242 5R21MH116515-02 29,533	107,349 106,345
Statistical methods for the assessment of social engagement in psychosis using digital technologies  93.242 5R01MH10631-05  93.242 5K01MH118477-02  Implicit serial learning in monkeys and humans  93.242 5R01MH11703-02  Negative Symptoms in Clinical High Risk and First Episode Psychiatric Illness: Investigation of a New Candidate for Targeted Treatment.  93.242 5R21MH116515-02  29.533	106,345
Implicit serial learning in monkeys and humans  93.242 5K01MH118477-02 0  Implicit serial learning in monkeys and humans  93.242 5R01MH111703-02 0  Negative Symptoms in Clinical High Risk and First Episode Psychiatric Illness: Investigation of a New Candidate for Targeted Treatment.  93.242 5R21MH116515-02 29,533	
Negative Symptoms in Clinical High Risk and First Episode Psychiatric Illness: Investigation of a New Candidate for Targeted Treatment.  93.242 5R01MH11703-02 0  93.242 5R21MH116515-02 29,533  The interactive roles of the amygdala and orbitofrontal cortex during reversal learning	104,922
Candidate for Targeted Treatment. 93.242 5R21MH116515-02 29,533  The interactive roles of the amygdala and orbitofrontal cortex during reversal learning	
The interactive roles of the amygdala and orbitofrontal cortex during reversal learning 93.242 1R21MH116348-01A1 0	102,591
	100,124
Dorsoventral functional divergence of the hippocampal CA3 circuit 93.242 1K01MH117444-01 0	96,610
1/3-İdentifying regulatory mutations that influence neuropsychiatric disease 93.242 5U01MH105670-05 39,524	90,226
Development of fluorescent false neurotransmitters 93.242 5R01MH108186-05 0	87,413
The role of the hippocampal CA2 region in neuropsychiatric disease 93.242 5R01MH106629-04 0	86,991
Training and Mentoring in Neurocognitive Mechanisms of Eating Disorders 93.242 5K24MH113737-02 0	84,302
The role of dopaminergic and noradrenergic signaling in exploratory and exploitative behavioral states 93.242 5K99MH118412-02 0	83,662
Multiscale connectomic principles of resilience and susceptibility in mouse 93.242 5R01MH111918-04 0	77,930
Neural mechanisms of saccadic information seeking behavior 93.242 5R03MH115644-02 0	65,579
Regional Network for Mental Health Research in Latin America (Susser/Galea/Alvarado/Rojas) 93.242 5U19MH095718-05 38,928	60,729
Investigating the role of hilar mossy cells in anxiety-like behavior 93.242 5F30MH117927-02 0	49,524
Advancing PrEP for Black MSM: Community-Based Ethnography and Clinic-Based Intervention - ICAP (Colson/Hirsch) 93.242 4R01MH098723-05 0	49,264
Genetic analyses of complete circuit formation in Caenorhabditis elegans 93.242 5F32MH115438-03 0	
Unraveling constraints on motor cortical activity exploration and shaping during structural skilllearning using large-scale 2-photon imaging and holographic optogenetic stimulation 93.242 5F32MH118714-02 0	48,238

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Causally linking dendritic Ca2+ dynamics to CA1 circuit function and spatial learning using novel tools to precisely manipulate an endogenous Ca2+ buffering process	93.242	5F32MH118716-02		0	(Includes Subrecipients) 47,70
Ventral hippocampal regulation of hypothalamic circuits in learned andinnate threat processing	93.242	5F32MH114306-02		0	47,630
Impact of network oscillations on dendritic computation in hippocampal pyramidal neurons	93.242	5F31MH117892-02		0	44,52
Neuromodulatory and astrocyte influences on hippocampal place cell plasticity	93.242	5F31MH117870-02		0	44,524
Regulation of striatal maturation by dopamine and macroautophagy: implications for neuropsychiatric disorders	93.242	5F30MH114390-03		0	41,983
Neural and Behavioral Mechanisms of Persistence to Setbacks in Children Exposed to Early Caregiving Adversities	93.242	5F31MH115686-02		0	40,49
Optical imaging of dopamine kinetics in prefrontal cortex of normal and schizophrenia model mice	93.242	5F31MH109293-03		0	40,470
HIV Dissemination Science Training Program for Underrepresented Investigators	93.242	4R25MH080665-08		37,747	37,74
Focused ultrasound for noninvasive brain stimulation	93.242	5R01MH112142-03		0	34,61
Regional Network for Mental Health Research in Latin America (Susser/Galea/Alvarado/Rojas)	93.242	5U19MH095718-05		27,000	30,15
HIV Intervention Science Training Program for Underrepresented Investigators	93.242	5R25MH080665-10		26,332	26,33
Integrative methods for the identification of causal variants in mental disorder	93.242	5R01MH106910-03		0	25,190
Translational Research Training in Child Psychiatry	93.242	5T32MH016434-40		0	24,388
The neurophysiological basis of serial learning	93.242	5R01MH081153-09		0	24,268
Stigma Associated with a High-Risk State for Psychosis among Adolescents and Young Adults: Impacts on Identity and Social Integration	93.242	4R01MH096027-05		0	23,264
Deciphering the role of histone methyltransfe	93.242	5R01MH112860-03		0	23,179
Fronto-sensory circuit mechanisms of perceptual novelty processing	93.242	1K99MH115082-01		0	23,129
Developing a stem cell-based model to study MGE and CGE interneuron lineage specification	93.242	1R03MH119443-01		0	18,034
Mothers childhoods and the intergenerational transmission of mental health risk in the context of adversity	93.242	1K01MH117443-01A1		0	17,050
Genetic analyses of complete circuit formation in Caenorhabditis elegans	93.242	5F32MH115438-03		0	16,37

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Ventral hippocampal regulation of hypothalamic circuits in learned andinnate threat processing	93.242	5F32MH114306-02		0	12,690
HIV Intervention Science Training Program for Underrepresented Investigators	93.242	5R25MH080665-10		0	11,646
Advancing PrEP for Black MSM: Community-Based Ethnography and Clinic-Based Intervention - ICAP (Colson/Hirsch)	93.242	4R01MH098723-05		0	10,851
Research Training in Mood and Anxiety Disorders: From Animal Models to Patients	93.242	5T32MH015144-41		0	6,486
Two-photon optical control of astrocytic function	93.242	5R01MH101218-05		0	5,053
Research Training in Late-Life Neuropsychiatric Disorders	93.242	5T32MH020004-20		0	3,865
Applications of Novel Statistical Methods to CNVs in Autism and Schizophrenia	93.242	5R21MH106888-02		0	3,323
Regional Network for Mental Health Research in Latin America (Susser/Galea/Alvarado/Rojas)	93.242	5U19MH095718-05		0	3,141
Behavioral Sciences Research in HIV Infection	93.242	5T32MH019139-30		0	2,771
Training in Schizophrenia and Psychotic Disorders: From Animal Models to Patients	93.242	5T32MH018870-32		0	1,540
Network Dynamics in Learning and Memory in Humans	93.242	5F31MH109247-02		0	570
Research Training in Biobehavioral Disturbances of Eating Disorders	93.242	5T32MH096679-05		0	-40
Research Training in Mood and Anxiety Disorders: From Animal Models to Patients	93.242	5T32MH015144-41		0	-153
1/3-Identifying regulatory mutations that influence neuropsychiatric disease	93.242	5U01MH105670-05		0	-312
Translational Neuroscience Training Grant	93.242	5T32MH015174-43		0	-324
Research Training Program in Psychiatric Épidemiology	93.242	5T32MH013043-48		0	-485
HIV Dissemination Science Training Program for Underrepresented Investigators	93.242	4R25MH080665-08		0	-1,014
Training in Schizophrenia and Psychotic Disorders: From Animal Models to Patients	93.242	5T32MH018870-32		0	-2,915
Translational Research Training in Child Psychiatry	93.242	5T32MH016434-40		0	-3,070
Dissection of mediodorsal thalamic circuitry underlying flexible behavior	93.242	5F31MH106278-04		0	-3,974

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Role of dentate granule cell birth date in determining stress-related function	93.242	5F30MH111209-02		0	-8,673
Temporal dynamics of neurophysiological patterns as treatment targets in Sz	93.242	5R01MH109289-03		0	-20,910
Neurobiology and dynamics of Active Sensing	93.242	5P50MH109429-03		0	-26,028
Functional analysis of the 22q11.2 schizophrenia susceptibility genes	93.242	5R01MH067068-15		0	-66,374
				\$4,706,327	\$23,584,792
Alcohol Research Programs					
Mechanisms of synaptic loss by the classical complement pathway in motor circuit development and disease	93.273	51R01AA027079-02		0	357,285
Neural and Mobile Assessment of Behavior Change Among Problem Drinkers	93.273	5R01AA023653-02		180,624	327,974
Prefrontal cortex and adolescent binge drinking: Role of HCN channels	93.273	5R01AA023531-05		0	276,987
Age, period, and cohort effects on gender differences in alcohol use and alcohol use disorders in 47 national, longitudinally-followed cohorts	93.273	5R01AA026861-02		67,441	211,441
Prefrontal Pathways Engaged in Excessive Alcohol Consumption	93.273	5K99AA024507-02		0	180,333
The role of neuroimmune interactions in the pathogenesis of chronic pain	93.273	5R01AA027108-02		0	144,650
Influences Of In-Person Social Networks, Digital Social Networks And Neighborhoods On Adolescent Alcohol Consumption	93.273	5K01AA026327-02		0	114,182
Targeting DAMPs in Alcoholic Hepatitis	93.273	5U01AA021912-05		98,378	98,378
Optimizing Configurations of Roadside Sobriety Testing Checkpoints to Reduce Alcohol Involved Crashes	93.273	5R21AA025749-02		6,234	87,527
Race, Alcohol Consumption and Vehicle Crashes: An Epidemiologic Paradox	93.273	5K01AA021511-05		0	85,678
Testing associations among sexual identity, race/ethnicity, relationship characteristics, and hazard	93.273	5F32AA025816-03		0	57,333
Prefrontal cortex and adolescent binge drinking: Role of HCN channels	93.273	5R01AA023531-05		0	34,736
Testing associations among sexual identity, race/ethnicity, relationship characteristics, and hazard	93.273	5F32AA025816-03		0	9,825
Structural Intervention for Adolescent Alcohol Use and HIV Risk in Tanzania	93.273	5R21AA022868-02		0	-281

·					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
2/2 Multisite Study: Varenicline for Alcohol Dependent Smokers	93.273	5R01AA020389-04		-810	-810
Targeting DAMPs in Alcoholic Hepatitis	93.273	5U01AA021912-05		0	-14,605
				\$351,867	\$1,970,633
Drug Abuse and Addiction Research Programs					
A Cluster RCT to Increase HIV Testing in Substance Use Treatment Programs	93.279	5R01DA043130-04		720,554	1,346,343
Enhanced Access to HIV Care for Drug Users in San Juan, Puerto Rico (Metsch/Santana-Bagur)	93.279	5R01DA035280-05		572,776	967,945
Improving HIV Service Delivery for People who Inject Drugs in Kazakhstan	93.279	5R01DA041063-05		0	966,372
Non-Metabolized Pregnenolone Derivatives:New Treatment for Cannabis Use Disorder	93.279	5R01DA038875-02		632,378	713,232
Increasing Involvement of MSM in the Continuum of Care in Kazakhstan	93.279	5R01DA040513-04		0	668,165
A Multi-site Multi-Setting RCT of Integrated HIV Prevention and HCV Care for PWID	93.279	5R01DA045713-03		394,315	666,910
A Multimedia HIV/STI Intervention for Black Drug-involved Women on Probation	93.279	5R01DA038122-05		0	635,591
Probing mechanisms of amphetamine action at plasma membrane and vesicular transporters in vitro and in vivo	93.279	5R01DA041510-03		330,491	592,031
Evaluating a Microfinance Intervention for High Risk Women in Kazakhstan	93.279	5R01DA036514-05		0	582,547
Substance Abuse Epidemiology Training Program (SAETP) at Columbia University	93.279	5T32DA031099-08		0	494,560
Deciphering nuclear bodies and compartments that govern singular olfactory receptor expression.	93.279	5U01DA040582-05		152,675	460,667
Research Fellowship in Substance Abuse Disorder	93.279	5T32DA007294-27		0	453,243
Translational research to increase service access for NYS juvenile probationers	93.279	5U01DA036226-05		12,976	449,252
Preventing Drug Abuse among Hispanic Adolescents	93.279	4R01DA031477-05		0	417,301
Preventing Drug Abuse among Sexual-Minority Youth	93.279	5R01DA043512-02		0	374,551
Chemistry and Biology of Mitragynine Alkaloids	93.279	5R01DA046487-02		80,354	350,042

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Project RETAIN: Providing Integrated Care for HIV-Infected Crack Cocaine Users (Metsch/Del Rio)	93.279	5R01DA032098-06		348,474	348,474
State Medical Marijuana Laws and NSDUH Marijuana Use and Consequences Since 2004	93.279	5R01DA037866-05		2,868	326,308
Prescription Drug Use in the US Population:Gateway Effects and Family Patterns	93.279	5R01DA036748-04		0	292,917
Health Care Policy and Substance Abuse Treatment Access	93.279	5R01DA039137-03		150,506	281,514
Training Program on HIV and Substance Use in the Criminal Justice System	93.279	5T32DA037801-05		0	211,166
CHASE: An Innovative County-Level Public Health Response to the Opioid Epidemic in New York State	93.279	1UM1DA049415-01		0	176,315
Substance abuse history, mental health and firearm violence: from evidence to action	93.279	5R21DA041154-02		27,779	158,074
Substance Abuse Treatment Development and Clinical Research Mentoring	93.279	5K24DA029647-10		0	148,259
Assessing the Impact of State-Level Policies on Drug Use and HIV Risk for YMSM	93.279	5K01DA039804-04		0	130,497
Multi-level associations between medical marijuana laws and substance use disorder treatment	93.279	5K01DA045224-02		0	129,880
Deciphering nuclear bodies and compartments that govern singular olfactory receptor expression.	93.279	5U01DA040582-05		0	99,576
State Medical Marijuana Laws and NSDUH Marijuana Use and Consequences Since 2004	93.279	5R01DA037866-05		0	93,329
Venues and Risk Networks: Context of Substance Use and HIV among High Risk Women	93.279	5K01DA041233-03		0	91,432
State Medical Marijuana Laws and NSDUH Marijuana Use and Consequences Since 2004	93.279	5R01DA037866-05		0	82,411
A couple-based antiretroviral therapy adherence intervention for people who inject drugs in Kazakhstan	93.279	5K01DA044853-02		0	79,171
Social Stress and Substance Use Disparities in Sexual Minority Youth	93.279	4K01DA032558-05		0	77,597
Deciphering nuclear bodies and compartments that govern singular olfactory receptor expression.	93.279	5U01DA040582-05		-29,310	77,371
Presynaptic Mechanisms in Dopamine Neurotransmission	93.279	5R01DA007418-23		0	72,719
Using PET to Image the Neurochemistry of Addiction	93.279	5K02DA026525-10		0	62,131
Deciphering nuclear bodies and compartments that govern singular olfactory receptor expression.	93.279	5U01DA040582-05		0	60,908

#### The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Dopamine synapses and operant conditioning	93.279	2R01DA007418-24		0	(Includes Subrecipients) 60,815
Adolescent substance use as determinant and consequence of the school-to-prison pipeline: Disentangling individual risk, social determinants, and group disparities	93.279	1K01DA045955-01A1		0	52,831
Training Program on HIV and Substance Use in the Criminal Justice System	93.279	5T32DA037801-05		0	49,592
Neural signatures of learning complex environments in the amygdala-prefrontal network	93.279	1K99DA048748-01		0	34,726
Chemistry and Biology of Mitragynine Alkaloids	93.279	5R01DA046487-02		0	32,411
Gene Expression Programs in Maturing Dopamine Neurons: Temporal Regulation, Subcellular Localization, and Alteration by Amphetamine	93.279	1F30DA047775-01		0	28,110
The impact of criminal justice involvement on retention in a behavioral HIV prevention intervention for couples who use drugs in Almaty, Kazakhstan	93.279	5F31DA044794-02		0	27,090
Controlling epigenetic states and nuclear architecture in the brain	93.279	5R01DA036894-05		11,706	11,706
A Multimedia HIV/STI Intervention for Black Drug-involved Women on Probation	93.279	5R01DA038122-05		0	10,744
Effects of Cannabis on Neuronal Translation	93.279	5R03DA039440-02		0	5,128
The epigenetic impact of in utero opioid exposure on Generation Z	93.279	5R03DA040887-02		0	4,061
Research Fellowship in Substance Abuse Disorder	93.279	5T32DA007294-25		0	3,427
Brain Circuits Mediating Motivated Behaviors	93.279	5R01DA035025-05		0	3,124
Contextualizing & responding to HIV risk behaviors among Black drug offenders	93.279	5K01DA036411-05		0	1,125
Substance Use and Sexual Risk Behavior Among MSM in South African Townships	93.279	5F31DA037128-03		0	-507
Effects of Cannabis on Neuronal Translation	93.279	5R03DA039440-02		0	-795
Project RETAIN: Providing Integrated Care for HIV-Infected Crack Cocaine Users (Metsch/Del Rio)	93.279	5R01DA032098-06		-7,388	-7,388
Project RETAIN: Providing Integrated Care for HIV-Infected Crack Cocaine Users (Metsch/Del Rio)	93.279	5R01DA032098-06		0	-33,822
Substance Abuse Épidemiology Training Program (SAÉTP) at Columbia University	93.279	5T32DA031099-08		0	-38,672
				\$3,401,154	\$13,382,507

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Discovery and Applied Research for Technological Innovations to Improv	e Human Healtl	1			
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		129,825	1,004,263
Next-Generation Calcium Imaging Analysis Methods	93.286	5R01EB022913-03		0	773,891
Radiological Research Accelerator Facility (RARAF)	93.286	5P41EB002033-23		0	753,683
Graft Engineering of Allogeneic Hematopoietic Stem Cell Products with Molecular Cascades	93.286	5R01EB025221-02		0	342,636
Graft Engineering of Allogeneic Hematopoietic Stem Cell Products with Molecular Cascades	93.286	5R01EB025221-02		0	337,121
Optimization of ultrasound-faciliated blood-brain barrier opening	93.286	5R01EB009041-09		0	319,313
Monitoring Particulate, PAH, Allergen and Microbial Exposures in Asthmatic Kids	93.286	1U01EB021983-01		0	307,037
Early Detection and Mapping of Ischemia Using Myocardial Elastography	93.286	5R01EB006042-11		0	303,411
Optical Imaging of small bio-molecules in living cells and tissues by nonlinear Raman microscopy of	93.286	5R01EB020892-04		0	292,753
Advanced Modeling Techniques for Brain Imaging Data with PET	93.286	5R01EB024526-03		45,172	224,639
Monitoring Particulate, PAH, Allergen and Microbial Exposures in Asthmatic Kids	93.286	1U01EB021983-01		39,908	204,434
Graft Engineering of Allogeneic Hematopoietic Stem Cell Products with Molecular Cascades	93.286	5R01EB025221-02		0	177,691
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		0	175,494
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		0	153,271
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		128,322	149,625
Radiological Research Accelerator Facility (RARAF)	93.286	5P41EB002033-23		0	106,881
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		0	58,116
Monitoring Particulate, PAH, Allergen and Microbial Exposures in Asthmatic Kids	93.286	1U01EB021983-01		0	52,655

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Mechanistic Monitoring of Ultrasound Neuromodulation	93.286	1R01EB027576-01A1		0	46,020
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		0	43,988
Monitoring Particulate, PAH, Allergen and Microbial Exposures in Asthmatic Kids	93.286	1U01EB021983-01		14,249	25,885
Intranasal delivery through the blood-brain barrier using focused ultrasound	93.286	5R21EB021103-02		0	22,863
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		0	6,931
Multi-tissue platform for modeling systemic pathologies	93.286	5UG3EB025765-02		0	5,237
Monitoring Particulate, PAH, Allergen and Microbial Exposures in Asthmatic Kids	93.286	1U01EB021983-01		0	700
Radiological Research Accelerator Facility (RARAF)	93.286	5P41EB002033-23		0	-693
Intranasal delivery through the blood-brain barrier using focused ultrasound	93.286	5R21EB021103-02		0	-4,711
Radiological Research Accelerator Facility (RARAF)	93.286	5P41EB002033-23		0	-6,867
				\$357,476	\$5,876,267
Minority Health and Health Disparities Research					
A Pragmatic Clinical Trial of MyPEEPS Mobile to Improve HIV prevention Behaviors in Diverse Adolescent MSM	93.307	5U01MD011279-03		538,196	1,221,046
Cultural Script Interpretation and HIV Risk in a Diverse Sample of Young Urban MSM	93.307	5R01MD010529-04		83,897	720,124
Racial and Ethnic Disparities in Chronic Disease Outcomes and Nurse Practitioner Practice	93.307	5R01MD011514-03		117,174	593,427
Impact of breast density information disclosure in racially diverse populations	93.307	5R01MD011506-04		0	584,897
Exchange Sex and HIV Risk among MSM Online	93.307	5R01MD011587-03		14,482	423,386
Ancestry, Genetic Risk and Health Disparities in Immune-Mediated Nephritis	93.307	5R01MD009223-05		0	325,063
Next Generation	93.307	5T37MD008637-05		0	145,606
Racial Disparities, Influenza Like Illness and the Association between Short-term Exposure to Ambient Air Pollution and Cardiovascular Outcomes	93.307	5R21MD012451-02		0	138,179

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
A Pragmatic Clinical Trial of MyPEEPS Mobile to Improve HIV prevention Behaviors in Diverse Adolescent MSM	93.307	5U01MD011279-03		5,867	89,770
The COMIDITA study: urban Latino toddlers, diet intake and developmental outcomes	93.307	1R21MD013622-01A1		0	83,003
A Pragmatic Clinical Trial of MyPEEPS Mobile to Improve HIV prevention Behaviors in Diverse Adolescent MSM	93.307	5U01MD011279-03		46,677	61,677
A Pragmatic Clinical Trial of MyPEEPS Mobile to Improve HIV prevention Behaviors in Diverse Adolescent MSM	93.307	5U01MD011279-03		20,178	34,147
Ancestry, Genetic Risk and Health Disparities in Immune-Mediated Nephritis	93.307	5R01MD009223-05		0	14,511
A Pragmatic Clinical Trial of MyPEEPS Mobile to Improve HIV prevention Behaviors in Diverse Adolescent MSM	93.307	5U01MD011279-03		0	-192
				\$826,471	\$4,434,644
Trans-NIH Research Support					
New York City Consortium for Precision Medicine	93.310	1OT2OD026556		6,121,796	10,005,083
New York City Consortium for Precision Medicine	93.310	1OT2OD026556		0	1,474,477
Identifying Newborns at Risk of Adverse Neurodevelopmental Outcomes and Obesity from Air Pollution	93.310	5UH3OD023290-04		0	1,167,582
Foundational tools to study the impacts of sympathetic activity on the neuroanatomy and function of brown adipose tissue	93.310	1OT2OD023853-01		107,738	703,100
New York City Consortium for Precision Medicine	93.310	1OT2OD026556		0	527,656
Re-engineering Precision Therapeutics Through N-of-1 Trials	93.310	5R01LM012836-02		0	446,545
New York City Consortium for Precision Medicine	93.310	1OT2OD026556		0	438,403
The internal states of neural circuits: data analysis, modeling and disease	93.310	5DP5OD019897-05		0	411,860
Geographic variation in the diverse tobacco retail environment and its impact on tobacco use disparities	93.310	5DP5OD023064-04		0	333,590
Functional connectomics of the neocortical microcircuit	93.310	5DP1EY024503-05		0	321,589
Identifying Newborns at Risk of Adverse Neurodevelopmental Outcomes and Obesity from Air Pollution.	93.310	5UG3OD023290-02		51,405	314,076
Hacking Epidemics: Unlocking The Drivers of Transmission Seasonality to Battle Vaccine-Preventable Diseases	93.310	5DP5OD023100-05		0	294,093

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
New York City Consortium for Precision Medicine	93.310	1OT2OD026556		0	(Includes Subrecipients) 197,616
Foundational tools to study the impacts of sympathetic activity on the neuroanatomy and function of brown adipose tissue	93.310	1OT2OD023853-01		82,237	168,649
New York City Consortium for Precision Medicine	93.310	1OT2OD026556		0	163,718
Multi-platform Educational Program in Innovative Methods for the Behavioral and Social Sciences	93.310	3R25GM111757-04S1		0	127,621
Multi-platform Educational Program in Innovative Methods for the Behavioral and Social Sciences	93.310	3R25GM111757-04S1		0	103,680
Studying human dendritic cells and DC-SIGN in HIV transmission in vivo using an improved humanized mouse model	93.310	5R21OD023291-02		0	95,377
Re-engineering Precision Therapeutics Through N-of-1 Trials	93.310	5R01LM012836-02		0	13,140
Foundational tools to study the impacts of sympathetic activity on the neuroanatomy and function of brown adipose tissue	93.310	1OT2OD023853-01		0	2,446
Novel sub-cellular chemical and mechanical nanoimaging	93.310	1DP2EB018657-01		0	469
Columbia/Cornell/Harlem Hospital Precision Medicine Initiative HPO	93.310	1UG3OD023183-01		0	-2,251
				\$6,363,176	\$17,308,519
National Center for Advancing Translational Sciences					
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	1,377,493
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	1,266,336
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	918,261
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	831,697
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	810,565
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	809,834
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	772,029
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	721,275

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Biomedical Data Translator Technical Feasibility Assessment and Architecture Design	93.350	1OT3TR002027-01		181,204	(Includes Subrecipients) 626,906
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		94,391	367,666
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	361,756
Bioprinting 3D skin for patient-specific drug discovery in inflammatory skin diseases.	93.350	5U18TR002305-02		0	359,247
Preclinical Evaluation of Vorinostat in Alopecia Areata	93.350	4UH3TR002090-03		0	317,647
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		55,231	295,927
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	240,743
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		15,576	198,895
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		8,806	192,320
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		0	138,645
Institutional Career Development Core	93.350	5KL2TR001874-04		0	137,293
Institutional Career Development Core	93.350	5KL2TR001874-04		0	134,246
Institutional Career Development Core	93.350	5KL2TR001874-04		0	130,044
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	120,054
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	117,816
Institutional Career Development Core	93.350	5KL2TR001874-04		0	112,180
Institutional Career Development Core	93.350	5KL2TR001874-04		0	112,101
Institutional Career Development Core	93.350	5KL2TR001874-04		0	110,702
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	105,203
Biomedical Data Translator Technical Feasibility Assessment and Architecture Design	93.350	10T3TR002027-01		0	100,832

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Biomedical Data Translator Technical Feasibility Assessment and Architecture Design	93.350	1OT3TR002027-01		89,054	97,256
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		0	90,891
Institutional Career Development Core	93.350	5KL2TR001874-04		0	83,227
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	82,169
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		0	75,800
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	73,787
Institutional Career Development Core	93.350	5KL2TR001874-04		0	73,748
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		0	72,558
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	69,748
NRSA Training Core	93.350	5TL1TR001875-04		0	68,922
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	64,000
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	63,856
NRSA Training Core	93.350	5TL1TR001875-04		0	63,531
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	63,512
Institutional Career Development Core	93.350	5KL2TR001874-04		0	62,803
NRSA Training Core	93.350	5TL1TR001875-04		0	61,332
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	60,878
NRSA Training Core	93.350	5TL1TR001875-04		0	57,451
Integrated Microphysiological System of Cerebral Organoid and Blood Vessel for Disease Modeling and Neuropsychiatric Drug screening	93.350	5UG3TR002151-02		0	56,186
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	55,844

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Institutional Career Development Core	93.350	5KL2TR001874-04		0	54,870
NRSA Training Core	93.350	5TL1TR001875-04		0	54,202
Institutional Career Development Core	93.350	5KL2TR001874-04		0	52,831
NRSA Training Core	93.350	5TL1TR001875-04		0	51,784
Institutional Career Development Core	93.350	5KL2TR001874-04		0	50,104
NRSA Training Core	93.350	5TL1TR001875-04		0	47,471
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	46,616
NRSA Training Core	93.350	5TL1TR001875-04		0	44,204
NRSA Training Core	93.350	5TL1TR001875-04		0	43,525
NRSA Training Core	93.350	5TL1TR001875-04		0	43,507
NRSA Training Core	93.350	5TL1TR001875-04		0	43,434
NRSA Training Core	93.350	5TL1TR001875-04		0	43,158
NRSA Training Core	93.350	5TL1TR001875-04		0	42,665
NRSA Training Core	93.350	5TL1TR001875-04		0	40,257
NRSA Training Core	93.350	5TL1TR001875-04		0	37,266
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	37,071
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	36,897
Bioprinting 3D skin for patient-specific drug discovery in inflammatory skin diseases.	93.350	5U18TR002305-02		0	34,623
NRSA Training Core	93.350	5TL1TR001875-04		0	34,041
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	33,128

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Draiget No.	Pass-through Contract Number	Cubracinianta	R&D Cluster
	CFDA	Project No	Fass-tillough Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
NRSA Training Core	93.350	5TL1TR001875-04		0	31,920
Institutional Career Development Core	93.350	5KL2TR001874-04		0	26,893
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	24,068
NRSA Training Core	93.350	5TL1TR001875-04		0	24,021
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	23,991
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	23,934
NRSA Training Core	93.350	5TL1TR001875-04		0	23,916
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	23,660
Institutional Career Development Core	93.350	5KL2TR001874-04		0	22,192
NRSA Training Core	93.350	5TL1TR001875-04		0	19,702
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	17,721
NRSA Training Core	93.350	5TL1TR001875-04		0	14,282
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	14,229
Institutional Career Development Core	93.350	5KL2TR001874-04		0	12,894
Institutional Career Development Core	93.350	5KL2TR001874-04		0	12,342
Institutional Career Development Core	93.350	5KL2TR001874-04		0	11,809
Institutional Career Development Core	93.350	5KL2TR001874-04		0	10,385
Institutional Career Development Core	93.350	5KL2TR001874-04		0	10,384
Institutional Career Development Core	93.350	5KL2TR001874-04		0	10,384
NRSA Training Core	93.350	5TL1TR001875-04		0	8,757

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Institutional Career Development Core	93.350	5KL2TR001874-04		0	(Includes Subrecipients) 8,71
NRSA Training Core	93.350	5TL1TR001875-04		0	8,71
Institutional Career Development Core	93.350	5KL2TR001874-04		0	7,78
NRSA Training Core	93.350	5TL1TR001875-04		0	7,26
NRSA Training Core	93.350	5TL1TR001875-04		0	6,70
NRSA Training Core	93.350	5TL1TR001875-04		0	6,56
Preclinical Evaluation of Vorinostat in Alopecia Areata	93.350	4UH3TR002090-03		0	5,63
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	5,59
NRSA Training Core	93.350	5TL1TR001875-04		0	5,51
NRSA Training Core	93.350	5TL1TR001875-04		0	5,09
NRSA Training Core	93.350	5TL1TR001875-04		0	4,46
NRSA Training Core	93.350	5TL1TR001875-04		0	4,46
NR\$A Training Core	93.350	5TL1TR001875-04		0	4,46
NRSA Training Core	93.350	5TL1TR001875-04		0	4,37
NRSA Training Core	93.350	5TL1TR001875-04		0	4,37
Člinical and Translational Science Award	93.350	5UL1TR001873-04		0	3,37
Institutional Career Development Core	93.350	5KL2TR001874-04		0	3,25
NRSA Training Core	93.350	5TL1TR001875-04		0	1,60
NRSA Training Core	93.350	5TL1TR001875-04		0	1,35
Institutional Career Development Core	93.350	5KL2TR001874-04		0	1,03

For year ended June 30, 2019

ederal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Institutional Career Development Core	93.350	5KL2TR001874-04		0	-108
NRSA Training Core	93.350	5TL1TR001875-04		0	-286
NRSA Training Core	93.350	5TL1TR001875-04		0	-300
NRSA Training Core	93.350	5TL1TR001875-04		0	-52:
NRSA Training Core	93.350	5TL1TR001875-04		0	-79
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	-2,41
NRSA Training Core	93.350	5TL1TR001875-04		0	-4,300
Clinical and Translational Science Award	93.350	5UL1TR001873-04		0	-5,54
				\$444,262	\$14,510,43
esearch Infrastructure Programs					
6 MeV/amu ion linac for deep-penetration microbeam and millimeter-beam charged-particle irradiations in small animals and biological tissues	93.351	1S10OD025190-01		0	1,458,75
Robust allograft tolerance in non-human primates	93.351	5R01OD017949-05		0	696,45
Helios, a CyTOF System	93.351	1S10OD025218-01		0	600,000
Effects of ApoE-enhancing Compounds on Alzheimers Disease Phenotypes In Vivo	93.351	1R21TR002029-01A1		42,141	330,41
A multi-wavelength lighsheet microscope for volumetric imaging	93.351	1S10OD023587-01		0	235,78
TCR and BCR deep sequencing to distinguish autoimmune recurrence from allograft rejection	93.351	5R21TR002279-02		13,419	224,76
Combination CD-Fluorescence Polarization Spectrophotometer for the Columbia Precision Biomolecular Characterization Facility	93.351	1S10OD025102-01		0	138,37
Robust allograft tolerance in non-human primates	93.351	5R01OD017949-05		0	13,21
				\$55,560	\$3,697,755

**Nursing Research** 

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Communicating narrative Concerns entered by RNs (CONCERN)	93.361	7R01NR016941-02		230,050	669,473
Infection Prevention in Home Health Care (InHome)	93.361	5R01NR016865-02		211,051	620,374
Study of Infection Management and Palliative Care at End-of-Life (SIMP-EL)	93.361	5R01NR013687-07		267,491	619,096
Video Information Provider for HIV-Associated Non-AIDS (VIP-HANA) Symptoms	93.361	5R01NR015737-04		1,513	472,810
iPhone helping evaluated Atrial Fibrillation Rhythm through Technology (iHEART)	93.361	5R01NR014853-04		0	418,966
Reducing Health Disparities Through Informatics	93.361	5T32NR007969-18		0	392,457
Comparative and Cost-Effectiveness Research Training for Nurse Scientists	93.361	5T32NR014205-07		0	339,463
Hydroxyurea Adherence for Personal Best in Sickle Cell Treatment	93.361	5R01NR017206-03		94,307	307,847
Study of Infection Management and Palliative Care at End-of-Life (SIMP-EL)	93.361	5R01NR013687-07		128,763	279,539
Effect of an integrated nutrition-math curriculum to improve food-purchasing behavior of children	93.361	5R01NR017571-02		0	233,786
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	210,221
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	179,997
Hydroxyurea Adherence for Personal Best in Sickle Cell Treatment	93.361	5R01NR017206-03		0	177,788
New York City Hispanic Dementia Caregiver Research Program (NHiRP)	93.361	5R01NR014430-05		64,451	176,422
Video Information Provider for HIV-Associated Non-AIDS (VIP-HANA) Symptoms	93.361	5R01NR015737-04		0	175,230
Self-care decision-making: Feasibility or the BREATHE asthma intervention trial	93.361	5R21NR016507-02		119,288	161,610
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	118,831
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	110,189
Advancing Chronic Condition Symptom Cluster Science Through Use of Electronic Health Records and Data Science Techniques	93.361	5K99NR017651-02		0	94,023
Video Information Provider for HIV-Associated Non-AIDS (VIP-HANA) Symptoms	93.361	5R01NR015737-04		0	82,190

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		40,736	81,835
Information visualizations to facilitate clinician-patient communication in HIV care (Info Viz: HIV)	93.361	1K99NR017829-01A1		0	71,086
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		5,782	56,724
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	37,292
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	34,040
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	22,976
mHealth for Heart Failure Symptom Monitoring	93.361	5K99NR016275-02		0	19,244
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	13,510
Mentoring and Research in Self-Management for Health Promotion and Disease Prevention	93.361	1K24NR018621-01		0	10,939
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	7,512
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	6,681
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	6,643
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	6,466
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	6,119
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	6,107
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	5,237
Video Information Provider for HIV-Associated Non-AIDS (VIP-HANA) Symptoms	93.361	5R01NR015737-04		0	4,629
Reducing Health Disparities Through Informatics	93.361	5T32NR007969-18		0	4,442
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	4,419
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	3,018

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	(Includes Subrecipients) 2,579
Center for Improving Palliative Care for Vulnerable Adults with MCC (CIPC)	93.361	1P20NR018072-01		0	1,331
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	375
Training in Interdisciplinary Research to Prevent Infections (TIRI)	93.361	4T32NR013454-05		0	-81
Precision in Symptom Self-Management (PriSSM) Center	93.361	5P30NR016587-03		0	-710
Training in Interdisciplinary Research to Prevent Infections (TIRI)	93.361	4T32NR013454-05		0	-959
New York City Hispanic Dementia Caregiver Research Program (NHiRP)	93.361	5R01NR014430-05		0	-1,070
				\$1,163,432	\$6,250,696
Cancer Cause and Prevention Research					
Breast Cancer Family Registry Cohort	93.393	5U01CA164920-07		782,148	1,457,899
Controlling Esophageal Cancer: A Collaborative Modeling Approach	93.393	5U01CA199336-05		624,531	1,130,828
Molecular pathways and targeted therapies in human leukemia	93.393	5R35CA210065-03		0	949,761
From pathogenesis to new therapeutic targets in Diffuse Large B cell Lymphoma	93.393	5R35CA210105-04		0	925,095
DNA Repair and Genomic Instability in Cancer Development and Therapy	93.393	5R35CA197606-05		0	850,847
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		100,000	845,224
The Role of Stem Cells and the Microenvironment in Gastrointestinal Cancers	93.393	5R35CA210088-03		38,762	604,558
HMGB1 as Link Between Hepatocellular Injury and HCC	93.393	5R01CA200597-04		91,500	576,579
À Prospective, Randomized Study to Compare Effects of Ülipristal Acetate with a Combined Oral Contraceptive on Breast Epithelial Cell Proliferation	93.393	5R01CA200795-04		59,844	518,204
The role of butyrate-producing bacteria in CIMP colorectal cancer tumorigenesis	93.393	5R01CA205028-03		132,218	504,121
Replication fork remodeling and genomic stability	93.393	5R01CA197774-04		0	448,080

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Mathedation and materials in DDA and minute of multiple falls and materials					(Includes Subrecipients)
Methylation and mutations in RB1 and variants of synthetic folic acid metabolism	93.393	5R01CA192662-04		93,538	437,06
The epigenetic mechanisms of high-grade pedia	93.393	5R01CA204297-03		128,825	413,266
Genomics and Mechanisms of Esophageal Carcinogenesis	93.393	5R01CA208711-04		0	396,349
Role of KMT2D gene inactivation in B cell non-Hodgkin Lymphoma	93.393	5R01CA172492-07		0	390,690
The Role of Stem Cells and the Microenvironment in Gastrointestinal Cancers	93.393	5R35CA210088-03		12,112	386,998
The catalytic and non-catalytic functions of PARP1 in cancer biology	93.393	5R01CA226852-02		0	386,182
The role of ATM in suppression of lymphomas	93.393	5R01CA158073-08		0	369,40
The structural function of ATR in development, oncogenesis and cancer therapy	93.393	5R01CA215067-03		0	364,44
Integrating Mammograms in Analyses of Genes and Environment in Sisters (IMAGES)	93.393	5U01CA203993-03		0	344,17 <sup>-</sup>
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	340,376
Fusobacterium nucleatum-mediated stimulation of colorectal cancer: mechanistic studies	93.393	5R01CA192111-05		0	321,019
The mechanisms driving brain oncogenesis by FGFR-TACC gene fusions	93.393	5R01CA178546-05		17,725	297,65
Improving Esophageal Adenocarcinoma Prevention, Screening and Treatment	93.393	7R01CA140574-10		58,523	285,547
Increasing breast cancer chemoprevention in the primary care setting	93.393	5R01CA177995-05		249,837	264,837
Increasing breast cancer chemoprevention in the primary care setting	93.393	5R01CA177995-05		0	264,190
Modeling bladder cancer pathogenesis and tumor evolution	93.393	5P01CA221757-02		0	259,267
Modeling bladder cancer pathogenesis and tumor evolution	93.393	5P01CA221757-02		0	257,478
NSD1 Inactivation in Head and Neck Cancer	93.393	5R00CA212257-04		0	250,048
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	225,667
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	224,888

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<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Increasing breast cancer chemoprevention in the primary care setting	93.393	5R01CA177995-05		0	215,650
DNA-PKCS Phosphorylation in DNA Repair and Chromosomal Translocations	93.393	5R01CA184187-05		0	212,895
The Influence of Hospital Variability on the Management of Cancer-Associated Complications	93.393	5R01CA169121-05		0	204,561
Integrating Mammograms in Analyses of Genes and Environment in Sisters (IMAGES)	93.393	5U01CA203993-03		0	194,972
CAPRI: Columbia Cancer Training Program for Resident-Investigators	93.393	5R38CA231577-02		0	176,682
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	155,015
CONSTRUCTION AND ANALYSIS OF RETROVIRUS MUTANTS	93.393	5R01CA030488-38		0	146,696
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		101,643	135,962
Breast Cancer Family Registry Cohort	93.393	5U01CA164920-07		0	134,518
The epigenetic mechanisms of high-grade pedia	93.393	5R01CA204297-03		0	132,089
Restoring genome stability and tumor suppression in BRCA1 deficient cells	93.393	1R01CA227450-01A1		0	128,435
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		0	108,153
Molecular pathways and targeted therapies in human leukemia	93.393	5R35CA210065-03		0	107,373
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	102,323
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	102,182
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		0	97,802
Multicenter trial of decision support for breast cancer chemoprevention	93.393	1R01CA226060-01A1		0	97,512
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		0	97,202
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	82,016
Modeling bladder cancer pathogenesis and tumor evolution	93.393	5P01CA221757-02		0	75,648

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<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
DNA Double-Strand Break Repair, Chromosomes Translocations and Cancer	93.393	5P01CA174653-05		0	73,248
Breast Cancer Family Registry Cohort	93.393	5U01CA164920-07		0	62,514
Modeling bladder cancer pathogenesis and tumor evolution	93.393	5P01CA221757-02		5,249	59,558
Helicase regulation during homologous recombination	93.393	1R01CA236606-01		0	55,710
DNA Repair and Genomic Instability in Cancer Development and Therapy	93.393	5R35CA197606-05		0	54,492
Multicenter trial of decision support for breast cancer chemoprevention	93.393	1R01CA226060-01A1		0	47,659
Modeling bladder cancer pathogenesis and tumor evolution	93.393	5P01CA221757-02		27,372	42,872
From pathogenesis to new therapeutic targets in Diffuse Large B cell Lymphoma	93.393	5R35CA210105-04		0	39,749
Modeling bladder cancer pathogenesis and tumor evolution	93.393	5P01CA221757-02		0	38,155
The epigenetic mechanisms of high-grade pedia	93.393	5R01CA204297-03		0	35,473
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		0	32,370
Restoring genome stability and tumor suppression in BRCA1 deficient cells	93.393	1R01CA227450-01A1		0	26,336
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		0	14,141
Increasing breast cancer chemoprevention in the primary care setting	93.393	5R01CA177995-05		0	11,890
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		0	7,772
Modeling bladder cancer pathogenesis and tumor evolution	93.393	5P01CA221757-02		4,362	7,066
The role of a histone H4 phosphorylation in drug resistance	93.393	7R01CA157489-05		0	5,032
Mechanisms of Radioresistance and Cell Cycle Progression	93.393	5R01CA130536-21		0	-3
Genes, Environment and Breast Cancer Risk: The 15 Year Follow-up of the Prof-SC (Terry/Hopper)	93.393	5R01CA159868-05		0	-866
The Role of Stem Cells and the Microenvironment in Gastrointestinal Cancers	93.393	5R35CA210088-03		0	-6,275

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
<del>-</del>	CLDA	FIGECTIO	r ass-unough Contract Number	Subrecipients	(Includes Subrecipients)
Systematic Identification and Pharmacological Targeting of Tumor Dependencies for Precision Cancer Medicine	93.393	5U01CA217858-03		0	-41,601
Mechanisms of Radioresistance and Cell Cycle Progression	93.393	4R01CA130536-22		0	-107,147
				\$2,528,189	\$18,456,564
Cancer Detection and Diagnosis Research					
An Integrated Theranostic System for Breast Cancer	93.394	5R01CA228275-02		0	610,573
Cook For Your Life: Maintaining Dietary Change among Breast Cancer Survivors	93.394	5R01CA186080-05		162,491	524,566
Éarly Detection of Ovarian Cancer Through Épigenetic Factors in the WHi	93.394	5R01CA204119-04		39,411	399,968
Large-Scale Integration of Single Cell RNA-Seq and High-Content Imaging for Analyzing Drug Response in Cancer	93.394	5R33CA202827-03		0	384,255
Validating Rapid Microfluidic Isolation of Personalized Aptamers for Monitoring Minimal Residual Disease in Multiple Myeloma	93.394	5R33CA196470-03		0	129,750
Validating Rapid Microfluidic Isolation of Personalized Aptamers for Monitoring Minimal Residual Disease in Multiple Myeloma	93.394	5R33CA196470-03		0	99,224
Novel Protein Risk Markers for Lung Cancer	93.394	5R21CA195110-02		24,113	62,045
Cook For Your Life: Maintaining Dietary Change among Breast Cancer Survivors	93.394	5R01CA186080-05		0	56,813
Cook For Your Life: Maintaining Dietary Change among Breast Cancer Survivors	93.394	5R01CA186080-05		0	50,405
Identifying leptomeningeal metastasis from breast cancer utilizing a novel immunocytochemical microfluidic device	93.394	5R03CA208547-02		0	39,366
Automated Microfluidic Selection of Aptamers against Carbohydrates	93.394	5R21CA199849-02		0	38,709
The Oral Microbiome for the Detection of Barretts Esophagus	93.394	1R01CA238433-01A1		0	28,418
Cook For Your Life: Maintaining Dietary Change among Breast Cancer Survivors	93.394	5R01CA186080-05		0	15,802
Validating Rapid Microfluidic Isolation of Personalized Aptamers for Monitoring Minimal Residual Disease in Multiple Myeloma	93.394	5R33CA196470-03		0	-187,368
				\$226,015	\$2,252,526

**Cancer Treatment Research** 

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Elucidating genetics of response to immune checkpoint blockade in lung cancer	93.395	5R01CA205426-03		301,671	(Includes Subrecipients) 633,199
CHRONIC CONVECTION ENHANCED DELIVERY (CED) OF TOPOTECAN FOR GLIOBLASTOMA	93.395	5R01CA161404-06		0	578,702
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	5UG1CA189960-05		2,000	541,531
Optimizing the Treatment of Pancreatic Adenocarcinoma	93.395	5R01CA212086-03		117,732	493,795
HAUSP inhibitors in p53-wild type and p53-mutant tumors	93.395	5R01CA193890-05		0	438,518
Therapeutically Exploiting a Newly Isolated Neural-Like Stem Cell Against GBM	93.395	5R01CA179072-05		0	405,269
Preclinical analyses of advanced prostate cancer in genetically-engineered mice	93.395	5R01CA173481-07		0	388,241
Molecular characterization and targeting of NT5C2 mutations in acute lymphoblastic leukemia	93.395	5R01CA216981-03		0	359,496
Analysis of drug response in organoids and mouse models	93.395	5R01CA196662-03		0	279,948
Ánalysis of drug response in organoids and mouse models	93.395	5R01CA196662-03		0	262,883
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	5UG1CA189960-05		0	242,334
Therapeutic potential of enhanced mitochondrial biogenesis for paclitaxel-induced peripheral neuropathy	93.395	5R21CA226672-02		0	208,858
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	5UG1CA189960-05		0	197,875
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	5UG1CA189960-05		6,000	159,363
Élucidating genetics of response to immune checkpoint blockade in lung cancer	93.395	5R01CA205426-03		0	139,779
Programmable Probiotics for Cancer	93.395	5R00CA197649-04		0	124,239
Molecular characterization and targeting of NT5C2 mutations in acute lymphoblastic leukemia	93.395	5R01CA216981-03		0	64,630
Development of first-in-class histone acetyltransferase (HAT) activators for precision targeting of epigenetic derangements in lymphoma	93.395	5R01CA222931-02		0	62,046
Non-melanoma skin cancer: A model for impact of aging on an environmental disease	93.395	5UH2CA213384-04		0	54,939
Elucidating genetics of response to immune checkpoint blockade in lung cancer	93.395	5R01CA205426-03		0	47,810

Flexible Tools for Pre-Clinical Studies to Answer Key Questions UnderlyingHeavylon Radiotherapy  Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	1U01CA236554-01	0	(Includes Subrecipients)
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395		Ü	35,821
		5UG1CA189960-05	 0	24,424
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	5UG1CA189960-05	 0	22,197
: Pre-Surgical trial of Metformin and Atorvastatin in Operable Breast Cancer	93.395	5R03CA186931-02	 0	10,932
State of the Science: Healthy Weight Maintenance During Pediatric, Adolescent, and Young Adult Cancer Treatment	93.395	1R13CA213937-01A1	 0	6,375
Preclinical analyses of advanced prostate cancer in genetically-engineered mice	93.395	5R01CA173481-05	 0	2,168
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	5UG1CA189960-05	 0	329
Columbia University Minority/Underserved Site NCI Community Oncology Research Program	93.395	5UG1CA189960-05	 0	-759
Non-melanoma skin cancer: A model for impact of aging on an environmental disease	93.395	4UH3CA213384-03	 0	-23,354
			 \$427,403	\$5,761,588
Cancer Biology Research				
Roles and Regulations of wild-type and mutant forms of p53	93.396	5P01CA087497-18	1,087,917	1,128,268
Elucidating the dependencies of tumor initiating and drug-resistant niches in human malignancies by genome-wide molecular profiling of single cells	93.396	5R35CA197745-04	 0	959,406
Defining the functions and translational potential of ferroptosis	93.396	5R35CA209896-04	 0	953,146
Functions and Activities of p53 and Mdm2 in Normal and Cancer Cells	93.396	5R35CA220526-02	 0	774,604
Integrating Radiomics into S0819 and Lung-MAP, Biomarker Driven Clinical Trials for Lung Cancer	93.396	5U01CA225431-02	 75,958	536,753
Role of Cancer-Associated Fibroblasts in Cholangiocarcinoma	93.396	5R01CA228483-02	 70,427	531,688
Roles and Regulations of wild-type and mutant forms of p53	93.396	5P01CA087497-18	 465,749	487,066
The Development And Progression Of IPMN To PDA In The Context Of Inactivated Activin Signaling	93.396	5R01CA217207-02	 0	482,862
Regulation of SLC7A11 by p53 in cancer metabolism	93.396	5R01CA190477-04	 0	451,482

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Analysis of cancer cell metabolism in diverse environmental conditions	93.396	5R01CA201276-04		164,490	(Includes Subrecipients) 403,80
The Role of wild-type Kras in the context of tumor progression and metastasis	93.396	5R01CA178445-05		0	375,869
The role of RHOA G17V Mutation on Peripheral T-cell Lymphomas	93.396	5R01CA197945-05		0	372,709
p53 acetylation in ferroptosis and tumor suppression	93.396	5R01CA224272-02		0	363,34
The role of the LZTR1 ubiquitin ligase in stem cells and cancer	93.396	5R01CA190891-05		0	358,038
Mechanisms of targeting oncoprotein SET in tumor suppression	93.396	5R01CA216884-03		0	346,114
Targeting cysteine import to induce ferroptotic cell death in pancreatic cancer	93.396	5R01CA215607-03		55,377	320,510
Structure and function of Transient Receptor Potential channels	93.396	5R01CA206573-03		0	318,229
Role of autophagy in normal and transformed hematopoietic stem cells	93.396	5R01CA184014-05		0	303,728
Molecular mechanisms of prostate cancer metastasis	93.396	5R01CA183929-05		0	298,823
Improving specificity of HPV Screen-and-Treat in South Africa	93.396	5UH3CA189908-05		266,741	294,742
Hepatic Stellate Cells and Liver Cancer	93.396	5R01CA190844-05		0	290,10
Regulation of P53 acetylation and deacetylation in tumorigenesis	93.396	5R01CA085533-15		0	285,774
Identification and modeling of driver genetic modules in glioblastoma	93.396	5R01CA179044-05		0	282,572
Investigating the cell of origin of bladder cancer	93.396	5R01CA193442-05		0	278,069
Role of MMP13 in Multiple Myeloma Bone Disease	93.396	5R01CA175313-05		27,178	234,764
Understanding the role of B-Ras proteins in tumorigenesis	93.396	5R01CA206556-04		0	233,626
An innate system for detection of aberrant tissue growth	93.396	5R01CA192838-05		0	221,168
Improving specificity of HPV Screen-and-Treat in South Africa	93.396	5UH3CA189908-05		0	206,443
Roles and Regulations of wild-type and mutant forms of p53	93.396	5P01CA087497-18		0	185,639

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Mitochondrial and nuclear functions of NKX3.1 in regulating oxidative stress in prostate cancer	93.396	1R01CA233176-01		0	163,095
Mechanisms of ID2 regulation in glioma	93.396	1R01CA239721-01		0	152,737
Roles and Regulations of wild-type and mutant forms of p53	93.396	5P01CA087497-18		0	139,846
Multiscale proteomics studies of DNA repair and genomic stability	93.396	5R50CA233182-02		0	129,803
Elucidating the dependencies of tumor initiating and drug-resistant niches in human malignancies by genome-wide molecular profiling of single cells	93.396	5R35CA197745-04		0	113,365
Elucidating the dependencies of tumor initiating and drug-resistant niches in human malignancies by genome-wide molecular profiling of single cells	93.396	5R35CA197745-04		0	111,594
Investigating the cell of origin of bladder cancer	93.396	5R01CA193442-05		0	96,363
Understanding the role of B-Ras proteins in tumorigenesis	93.396	5R01CA206556-04		0	85,141
Roles and Regulations of wild-type and mutant forms of p53	93.396	5P01CA087497-18		0	80,821
Roles and Regulations of wild-type and mutant forms of p53	93.396	5P01CA087497-18		0	71,046
Integrative Cancer Genomics: Drivers, Pathways and Drugs	93.396	4R01CA164729-05		0	69,910
Defining the functions and translational potential of ferroptosis	93.396	5R35CA209896-04		0	68,103
Identification and modeling of driver genetic modules in glioblastoma	93.396	5R01CA179044-05		0	42,580
(PQB5) Reconstruction of Evolutionary Networks using Cross-Sectional Genomic Data	93.396	5R01CA185486-04		0	18,248
Integrating Radiomics into S0819 and Lung-MAP, Biomarker Driven Clinical Trials for Lung Cancer	93.396	5U01CA225431-02		0	17,135
Analysis of epithelial heterogeneity in prostate development and cancer	93.396	1R01CA238005-01		0	15,939
Elucidating the dependencies of tumor initiating and drug-resistant niches in human malignancies by genome-wide molecular profiling of single cells	93.396	5R35CA197745-04		0	6,579
The Role of wild-type Kras in the context of tumor progression and metastasis	93.396	5R01CA178445-05		0	4,035
Defining the functions and translational potential of ferroptosis	93.396	5R35CA209896-04		0	1,630
The BARD1 tumor suppressor and breast cancer	93.396	5R01CA172272-05		0	228

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
				\$2,213,837	\$13,667,526
Cancer Centers Support Grants					
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	340,657
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	311,064
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	301,244
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	293,963
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		191,526	293,894
Cancer Center Support Grant	93.397	3P30CA013696-44SA		150,867	283,094
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	276,949
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	276,718
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		190,829	257,205
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	255,313
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	239,502
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	229,421
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	225,794
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	220,919
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	213,102
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	197,912
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	194,002
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	191,212

For year ended June 30, 2019

	For year ended June 30, 2019					R&D Cluster
Cancer Center Support Grant         53.307         3P3GCA013806-448A         0           Cancer Center Support Grant         53.307         3P3GCA013806-448A         0           The role of the mice environment in Barneti & Escephagus         93.307         \$US4CA163004-00         12,960           Center's Bydering Therapeutics (CaST)         \$3.307         \$US4CA209997-04         0           Cancer Center Support Grant         \$3.307         3P3GCA013806-448A         0	-	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
19.397   3790CA013686445A   0   12.86	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	167,448
Subsect   Superior Systems Therappelitics (CaST)   93.397   SUSACA1000987-04   0	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	161,680
Subsect Center Support Grant	The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		12,960	153,918
Same	Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	150,256
93.987 3P30CA013686-44SA 0 Centers for Cancer Systems Therapeutics (CaST) 93.987 5U54CA209997-04 0 Cancer Center Support Grant 93.997 3P30CA013898-44SA 0 Topology of Cancer Evolution and Heterogeneity 93.997 5U54CA193313-05 38.695  Cancer Center Support Grant 93.997 3P30CA013898-44SA 0 Topology of Cancer Evolution and Heterogeneity 93.997 5U54CA193313-05 0 Cancer Center Support Grant 93.997 3P30CA013898-44SA 0 Cancer Center Support Grant 93.997 5U54CA193313-05 0 Cancer Center Support Grant 93.997 5U54CA193313-05 0 Cancer Center Support Grant 93.997 5U54CA193313-05 0 Cancer Center Support Grant 93.997 3P30CA013898-44SA 85.153 Topology of Cancer Evolution and Heterogeneity 93.997 5U54CA193313-05 28.354 Cancer Center Support Grant 93.997 3P30CA013898-44SA 05.153	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	146,683
Say   Subscice   Support Grant   Support Gra	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	140,126
93.397   3P30CA013696-445A   0	Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	139,504
93.97 5U54CA193313-05 38,695  Cancer Center Support Grant 93.997 3P30CA013696-44SA 0  Topology of Cancer Evolution and Heterogeneity 93.997 5U54CA193313-05 0  Cancer Center Support Grant 93.997 3P30CA013696-44SA 0  Cancer Center Support Grant 93.997 3P30CA013696-44SA 0  Topology of Cancer Evolution and Heterogeneity 93.997 5U54CA193313-05 0  Cancer Center Support Grant 93.997 3P30CA013696-44SA 0  Cancer Center Support Grant 93.997 5U54CA193313-05 0  Cancer Center Support Grant 93.997 3P30CA013696-44SA 85.153  Topology of Cancer Evolution and Heterogeneity 93.997 5U54CA193313-05 26.354  Cancer Center Support Grant 93.997 3P30CA013696-44SA 0	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	138,574
93.397 3P30CA013696-44SA 0  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 85.153  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 26.354  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0	Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		38,695	134,748
93.397 5U54CA193313-05 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 85.153  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 26,354  Cancer Center Support Grant 93.397 3P30CA013696-44SA 85.153  Cancer Center Support Grant 93.397 5U54CA193313-05 26,354  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Centers for Cancer Systems Therapeutics (CaST)	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	125,741
93.397 3P30CA013696-44SA 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 85,153  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 26,354  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Centers for Cancer Support Grant 93.397 3P30CA013696-44SA 0  Centers for Cancer Support Grant 93.397 3P30CA013696-44SA 0	Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	122,778
93.397 3P30CA013696-44SA 0  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 0  Cancer Center Support Grant 93.397 3P30CA013696-44SA 85,153  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 26,354  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Center Support Grant 93.397 3P30CA013696-44SA 0	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	122,629
Substitution   Support Grant   Support Grant	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	122,184
93.397 3P30CA013696-44SA 85,153  Topology of Cancer Evolution and Heterogeneity 93.397 5U54CA193313-05 26,354  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Centers for Cancer Systems Therapeutics (CaST)	Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	117,421
93.397 5U54CA193313-05 26,354  Cancer Center Support Grant 93.397 3P30CA013696-44SA 0  Centers for Cancer Systems Therapeutics (CaST)	Cancer Center Support Grant	93.397	3P30CA013696-44SA		85,153	117,255
93.397 3P30CA013696-44SA 0  Centers for Cancer Systems Therapeutics (CaST)	Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		26,354	105,581
Centers for Cancer Systems Therapeutics (CaST)  93.397  5U54CA209997-04  0	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	103,963
	Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	102,873
Cancer Center Support Grant 93.397 3P30CA013696-44SA 0	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	102,600
Cancer Center Support Grant 93.397 3P30CA013696-44SA 0	Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	102,555

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For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		86,805	102,305
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	101,902
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	99,190
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		98,690	98,690
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	97,091
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	96,059
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	91,474
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	85,084
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	84,464
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	83,797
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	83,602
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	83,357
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		42,600	83,312
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	83,100
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	79,488
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	77,197
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	74,161
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	73,159
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	71,515
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	70,878

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	69,876
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		0	65,428
Cancer Center Support Grant	93.397	3P30CA013696-44SA		38,420	61,472
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	60,945
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		60,682	60,682
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	59,992
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	59,678
The role of the micro environment in Barrett s Esophagus	93.397	5U54CA163004-08		54,912	58,362
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		0	51,750
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	51,635
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	51,243
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	51,123
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		37,516	51,102
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	47,239
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	46,837
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	40,068
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	38,273
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	37,899
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		4,816	37,731
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	37,696

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	37,060
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	32,942
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	32,942
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	32,026
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		23,470	32,012
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		31,409	31,409
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	30,360
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	30,053
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	27,717
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	24,941
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	23,415
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	22,400
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	18,910
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	18,393
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	17,706
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	17,103
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		0	16,563
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	15,651
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	15,569
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	14,895

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	14,814
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	14,786
The role of the micro environment in Barrett s Esophagus	93.397	5U54CA163004-08		0	14,577
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	13,452
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	12,697
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	12,567
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	12,060
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	10,844
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		0	9,935
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	9,914
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		5,863	9,380
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	8,379
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	7,995
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	7,721
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	7,296
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	6,466
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		6,294	6,294
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	5,718
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	5,672
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	4,993

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
One and One to a Comment One at	<del></del>			<u> </u>	(Includes Subrecipients)
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	4,326
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	4,250
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		0	4,219
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	3,755
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	3,421
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	3,316
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	2,492
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	1,707
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	1,298
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		0	992
Centers for Cancer Systems Therapeutics (CaST)	93.397	5U54CA209997-04		0	287
The role of the micro environment in Barrett's Esophagus	93.397	5U54CA163004-08		0	267
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	96
Topology of Cancer Evolution and Heterogeneity	93.397	5U54CA193313-05		0	-54
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	-2,149
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	-2,357
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	-5,718
Cancer Center Support Grant	93.397	3P30CA013696-44SA		0	-87,521
				\$1,187,861	\$10,559,592

**Cancer Research Manpower** 

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Molecular Oncology Training Program	93.398	5T32CA203703-04		0	304,934
Training Program in Cancer-related Population Sciences	93.398	5T32CA094061-17		0	197,285
The Role of Androgens on Breast Cancer Susceptibility Across the Lifecourse	93.398	5K07CA218166-02		0	133,494
Childhood Infection and Pubertal Timing	93.398	5K01CA186943-05		0	123,216
À Novel Protein Complex Controls Homologous Recombination Repair in Breast Cancer	93.398	5K22CA178317-03		0	80,718
Engineering of bacterial probiotics for the detection and treatment of hepatocellular carcinoma	93.398	5F32CA225145-02		0	60,876
Mechanical regulation of breast cancer cell nuclei by the LINC complex	93.398	5F32CA221320-03		0	51,440
Super-Competition as a Mechanism for Preneoplastic Field Growth	93.398	5F31CA228451-02		0	44,524
Structural and Functional Characterization of the Epithelial Calcium Channel TRPV6	93.398	1F31CA232391-01		0	44,524
Evaluating Notch Signaling as a Therapeutic Target in Ovarian Cancer	93.398	5F31CA192891-05		0	43,443
Characterizing LIN-12/Notch Regulation and Activity	93.398	5F31CA236516-02		0	42,389
Understanding the Basis of Fidelity in Eukaryotic Recombinases	93.398	5F31CA210663-03		0	40,470
Discovery of pathogenic germline variants in pediatric cancers using genomics.	93.398	5F31CA210607-03		0	36,532
Role of Nuclear Actin Polymerization in Double-Strand Break Mobility and Repair	93.398	5F30CA217049-02		0	28,110
The role of a novel fusion oncogene FYN-TRAF3IP2 in peripheral T-cell lymphoma	93.398	5F30CA225052-02		0	25,169
Role of Nuclear Actin Polymerization in Double-Strand Break Mobility and Repair	93.398	5F30CA217049-02		0	24,122
The role of a novel fusion oncogene FYN-TRAF3IP2 in peripheral T-cell lymphoma	93.398	5F30CA225052-02		0	19,245
Molecular Oncology Training Program	93.398	5T32CA203703-04		0	14,292
Mechanical regulation of breast cancer cell nuclei by the LINC complex	93.398	5F32CA221320-03		0	8,744
Training Program in Cancer-related Population Sciences	93.398	5T32CA094061-17		0	5,953

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Understanding the Basis of Fidelity in Eukaryotic Recombinases	93.398	5F31CA210663-03		0	(Includes Subrecipients) 3,896
Investigation of luminal stem cells and castration resistance in prostate cancer	93.398	5K99CA194287-02		0	-
Cancer Biology Training Grant	93.398	4T32CA009503-30		0	-22
				\$0	\$1,333,15
Preventing Heart Attacks and Strokes in High Need Areas					
GENETIC, IMMUNOLOGIC AND MECHANISTIC BASIS OF HUMAN NK CELL DEFICIENCY	93.816	5R01AI120989-05		15,816	734,24
Directing Function at the Natural Killer Cell Secretory Immunological Synapse	93.816	5R01AI067946-14		0	409,83
				\$15,816	\$1,144,07
Cardiovascular Diseases Research					
Red blood cells from iron-deficient donors: recovery and storage quality	93.837	5R01HL133049-04		63,323	1,005,79
Enhancing Inflammation Resolution in Atherosclerosis via Targeted Nanoparticle-Mediated Delivery of Biologics	93.837	5R01HL127464-04		387,779	779,00
In vivo imaging of destructive processes in COPD	93.837	5R01HL131960-03		0	752,14
Chronic obstructive pulmonary disease in non-smokers	93.837	5R01HL130506-03		588,441	744,25
Elucidation of Tissue-Specific Transcriptomic Profiles in Cardio-metabolic Disease	93.837	5R01HL113147-07		56,202	743,37
Modeling, pathogenesis and treatment of idiopathic pulmonary fibrosis	93.837	5U01HL134760-04		0	721,76
Impact of Prolonged Sedentary Behavior on Cardiac Outcomes and Mortality in Acute Coronary Syndrome Patients	93.837	5R01HL134985-03		0	685,79
Mechanisms linking LNK genetic variation to atherothrombosis	93.837	5R01HL137663-03		0	650,61
Novel Therapy for Diabetic PAD Monitored With Dual Isotope Multimodality Imaging	93.837	5R01HL130056-04		0	647,24
Arrhythmia mapping using electromechanical wave imaging	93.837	5R01HL140646-02		0	584,65
Novel Cardioprotective sGC/cGMP Microdomains: Therapeutic Targets in Medically Treated HF	93.837	5R01HL138528-02		41,124	576,28

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
HDL-mediated cholesterol efflux and plaque inflammation in MESA	93.837	5R01HL127637-04		378,355	552,108
Mechanisms of Atherogenesis in Insulin Resistance	93.837	5P01HL087123-12		0	529,553
L-type channel trafficking and modulation in heart	93.837	5R01HL121253-06		0	526,835
Impact of PTSD on cardiovascular risk in survivors of stroke and transient ischemic attack	93.837	5R01HL132347-04		50,700	525,147
The Trinucleotide Repeat Containing 6a-Mediated miRNA Activities in the Ciliogenesis of Airway Epithelium	93.837	5R01HL131422-04		0	505,982
Molecular mechanisms of arrhythmia caused by high-fat diet	93.837	5R01HL136758-02		0	502,336
NOVEL MECHANISMS OF ALVEOLAR INFLAMMATION	93.837	5R01HL057556-21		0	481,757
Role of Rage in Bicuspid Aortic Valve Symdrome	93.837	5R01HL122805-05		48,054	481,201
Postdoctoral Training in Arteriosclerosis Research	93.837	5T32HL007343-42		0	470,949
Mechanisms of second heart field development regulated by Nkx genes	93.837	5R01HL131438-03		0	457,117
Phenotyping Genetic Disorders of Hepatic Lipid and Lipoprotein Metabolism in Cells, Mice, and Men	93.837	5R35HL135833-03		0	452,998
Mechanisms of Atherogenesis in Insulin Resistance	93.837	5P01HL087123-12		0	452,702
Identifying Early Intervention Targets for Reducing Cardiovascular Risk in Posttraumatic Stress	93.837	1R01HL139614-01A1		72,826	450,127
Human LincRNAs in Macrophage Biology and Related Cardiometabolic Diseases	93.837	5R01HL132561-03		0	449,561
Patient Level Prediction of Clinical Outcomes and Cost-Effectiveness inSPRINT (Optimize-SPRINT)	93.837	5R01HL139837-02		317,158	449,370
Modeling, pathogenesis and treatment of idiopathic pulmonary fibrosis	93.837	5U01HL134760-04		0	441,918
Phenotyping Genetic Disorders of Hepatic Lipid and Lipoprotein Metabolism in Cells, Mice, and Men	93.837	5R35HL135833-03		0	437,140
Unraveling the Complexity of Lipoprotein(a) Metabolism: Human Kinetic Studie	93.837	5R01HL139759-02		0	435,823
A novel molecular determinant of the cardiac beta1-adrenergic receptor response	93.837	5R01HL138468-02		164,658	428,577
Insulin action, reverse cholesterol transport, and HDL function	93.837	5R01HL125649-05		0	423,996

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Invivo high resolution imaging of the myocard	93.837	4DP2HL127776-02		0	(Includes Subrecipients) 418,883
Carotid plaque assessment using Pulse Wave Imaging	93.837	5R01HL135734-03		0	392,379
Test of a new theory to explain excess risk in cardiac PTSD	93.837	5R01HL128310-04		0	389,888
TTC39B in Metabolism	93.837	2R01HL119830-05		0	382,93
An Information tecHnology approach to implEmenting depression treAtment in caRdiac patienTs: iHeart Trial	93.837	5R01HL141609-02		0	382,162
Injectable microtissues to promote rapid host re-perfusion of ischemic tissues	93.837	5R01HL141935-02		0	381,83
Postdoctoral Training in Cardiovascular Disease	93.837	5T32HL007854-24		0	375,362
Elucidating the mechanisms of vascular dysfunction in heart failure	93.837	5R01HL126735-04		0	374,61
Ubiquitin Regulation of K Channels in Health and Disease	93.837	5R01HL142111-02		0	374,43
Molecular mechanisms underlying cardiac sodium channelopathy	93.837	5R01HL138486-03		0	367,72
Lung Barrier Protection by Tatylated Proteins	93.837	5R01HL036024-32		0	365,35
Cardiac Lipotoxicity and Ceramide Metabolism in Heart Failure	93.837	5R01HL114813-05		257,484	343,60
Psychological stress, and circadian patterns of sodium excretion and blood pressure	93.837	5R01HL137818-02		0	338,012
Depression Screening RCT in ACS patients: Quality of Life and Cost Outcomes	93.837	5R01HL114924-05		67,892	336,730
Model Based Approach to improving Hypertension Control in Populations	93.837	5R01HL130500-04		135,066	336,674
Columbia University Training Program in Lung Science	93.837	5T32HL105323-09		0	329,24
Optical Tomographic Imaging of Peripheral Arterial Disease	93.837	5R01HL115336-05		0	327,730
Mechanisms of Atherogenesis in Insulin Resistance	93.837	5P01HL087123-12		0	325,639
Potential future benefits of cardiovascular risk factor control in today s young adults	93.837	5R01HL107475-06		103,058	322,76
Testing biopsychosocial mechanisms of the posthospital syndrome model ofearly rehospitalization in acute coronary syndrome patients	93.837	5R01HL128497-04		0	321,102

For year ended June 30, 2019

For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Postdoctoral Training in Cardiovascular Disease	93.837	5T32HL007854-24		0	301,067
L-type channel trafficking and modulation in heart	93.837	5R01HL121253-06		0	300,517
Regulation of lipoprotein metabolism by adipose-specific Tribbles-	93.837	5R01HL141745-02		0	300,115
A Mechanistic and Translational Research Program Linking Impaired Resolution, Defective Efferocytosis, and Clonal Hematopoiesis to the Formation of Clinically Dangerous Atherosclerotic Plaques	93.837	1R35HL145228-01		0	289,054
Exploring the molecular physiology of atrial fibrillation	93.837	5R01HL140934-02		22,824	279,357
Mechanisms of Atherogenesis in Insulin Resistance	93.837	5P01HL087123-12		0	276,772
Testing biopsychosocial mechanisms of the posthospital syndrome model ofearly rehospitalization in acute coronary syndrome patients	93.837	5R01HL128497-04		0	266,243
Exploring the molecular physiology of atrial fibrillation	93.837	5R01HL140934-02		77,429	264,922
Training in Cardiovascular Translational Research	93.837	5T32HL120826-05		0	263,645
Macrophage-specific function of GWAS CAD-associated LIPA alleles in atherosclerosis	93.837	5R00HL130574-04		0	259,445
ABCA1/G1 and LXRs in Atherogenesis	93.837	5R01HL107653-08		0	258,256
Impact of circadian misalignment on energy balance regulation	93.837	5R01HL142648-02		0	251,877
Testing a rapid outpatient management strategy on PTSD, cardiovascular and rehospitalization risk in TIA and minor stroke survivors evaluated in the Emergency Department	93.837	5R01HL141811-02		0	222,934
HDL, platelet progenitors, atherosclerosis and trombosis	93.837	5R01HL118567-05		0	221,966
Engineering vascularized cardiac muscle	93.837	5R01HL076485-11		119,256	215,866
Impact of Social-Interpersonal Factors in the ER on PTSD/Cardiac Outcomes	93.837	5R01HL117832-05		0	204,307
Investigating fear of recurrence as a modifiable mechanism of behavior change to improve medication adherence in acute coronary syndrome patients	93.837	5R21HL145970-02		0	200,994
District Protein Kinase C-Delta Signaling Modes in Carlomyocytes	93.837	5R01HL123061-04		86,043	195,377
MerTK Cleavage and Signaling in Atherosclerosis	93.837	5R01HL132412-03		46,942	191,612
Testing a rapid outpatient management strategy on PTSD, cardiovascular and rehospitalization risk in TIA and minor stroke survivors evaluated in the Emergency Department	93.837	5R01HL141811-02		0	191,274

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Identifying Novel Behavioral Targets for Improving Sleep: A Self-Regulation Model	93.837	5K23HL125748-05		0	(Includes Subrecipients) 189,114
Mechanisms of Atherogenesis in Insulin Resistance	93.837	5P01HL087123-12		0	186,041
Identification and functional analysis of novel infantile cardiomyopathygenes	93.837	5K23HL138231-03		0	182,621
Mechanisms Of Long QT Syndrome 1 In Heart	93.837	5R01HL122421-04		0	180,429
Posttraumatic Stress and Cardiovascular Risk in Women: Tests of Biological Mechanisms	93.837	5K01HL130650-04		0	176,261
In vivo imaging of destructive processes in COPD	93.837	5R01HL131960-03		0	161,421
Mechanisms of Atherogenesis in Insulin Resistance	93.837	5P01HL087123-12		0	157,377
HDL-mediated cholesterol efflux and plaque inflammation in MESA	93.837	5R01HL127637-04		0	156,761
Role of Vascular Ion Channels in Heart Failure and Cardiovascular Diseases	93.837	5K08HL122526-05		0	153,686
Blood Pressure Measurement and Hypertension in Pregnancy	93.837	5K23HL136853-02		0	150,183
The Congenital Heart Technical Skill Study: Improving Outcomes forInfants and Children with Congenital Heart Disease	93.837	5K23HL133454-03		0	149,888
Genetic analysis of structural birth defects by integration of multiple diseases with epigenomic data and cancer mutations	93.837	5R03HL138352-02		0	147,142
Retail Outlet Health Klosk Hypertension Trial	93.837	5R34HL137659-02		0	146,327
Engineering Vascularized Cardiac Muscle	93.837	2R01HL076485-12		0	142,134
Impact of PTSD on cardiovascular risk in survivors of stroke and transient ischemic attack	93.837	5R01HL132347-04		0	140,209
Patient Level Prediction of Clinical Outcomes and Cost-Effectiveness inSPRINT (Optimize-SPRINT)	93.837	5R01HL139837-02		50,012	138,742
HDL-mediated cholesterol efflux and plaque inflammation in MESA	93.837	5R01HL127637-04		136,103	136,103
Patient health information preference and statin therapy	93.837	5K23HL121144-05		0	134,415
Exploring the molecular physiology of atrial fibrillation	93.837	5R01HL140934-02		0	132,675
Midcareer Investigator Award in Patient-Oriented Research in Human Hypertension	93.837	5K24HL125704-05		0	131,141

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Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
The Association of Damaging Genetic Variation With Ventricular Function in Hypoplastic Left Heart Syndrome	93.837	5K23HL143136-02		0	(Includes Subrecipients) 129,15
Modeling Marfan Syndrome with iSMC-based Tissue-engineered Blood Vessel	93.837	5R21HL140275-02		0	128,903
Short Term Training Grant	93.837	5T35HL007616-39		0	126,10 <sup>-</sup>
Exploring the molecular physiology of atrial fibrillation	93.837	5R01HL140934-02		0	125,798
The STK25 Signaling Pathway in Human Cardiac Cells	93.837	5K08HL140201-02		0	125,169
Translational Research of Negative Emotions and Acute Endothelial Dysfunction	93.837	5R01HL116470-05		0	125,084
Comparing the value of intensive systolic blood pressure treatment implementation strategies	93.837	5K01HL140170-02		0	119,920
Retail Outlet Health Klosk Hypertension Trial	93.837	5R34HL137659-02		0	115,062
Testing biopsychosocial mechanisms of the posthospital syndrome model ofearly rehospitalization in acute coronary syndrome patients	93.837	5R01HL128497-04		0	110,54
Harmful effects of transfusion-induced iron overload	93.837	1R21HL145319-01		0	103,648
Training in Cardiovascular Translational Research	93.837	5T32HL120826-07		0	102,669
Testing biopsychosocial mechanisms of the posthospital syndrome model ofearly rehospitalization in acute coronary syndrome patients	93.837	5R01HL128497-04		0	102,560
Mentored Patient Oriented Research in Cardiometabolic Disease	93.837	5K24HL107643-09		0	102,309
Psychological stress, and circadian patterns of sodium excretion and blood pressure	93.837	5R01HL137818-02		0	100,35
An Information tecHnology approach to implEmenting depression treAtment in caRdiac patienTs: iHeart Trial	93.837	5R01HL141609-02		0	99,844
CNS angiogenesis and blood-brain barrier regulation by the Wnt inhibitor Apcdd1	93.837	5R01HL116995-05		0	97,066
Ryanodine Receptor Defects in Cardiomyopathy Caused by Lamin A/C Gene Mutations	93.837	1R01HL142903-01A1		0	83,688
PTSD, Medication Adherence, and Prognosis after Acute Coronary Syndromes	93.837	5R01HL123368-04		0	78,062
Impact of Prolonged Sedentary Behavior on Cardiac Outcomes and Mortality in Acute Coronary Syndrome Patients	93.837	5R01HL134985-03		0	76,16
Processing of Apoptotic Cell-Derived Cargo by Macrophages Continues Efferocytosis and Drives Atherosclerosis Regression	93.837	1K99HL145131-01		0	68,740

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					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
BEST-DP: Biostatistics & Epidemiology Summer Training Diversity Program	93.837	2R25HL096260-11		0	64,519
HDL-mediated cholesterol efflux and plaque inflammation in MESA	93.837	5R01HL127637-04		0	61,359
Ryanodine Receptor Defects in Cardiomyopathy Caused by Lamin A/C Gene Mutations	93.837	1R01HL142903-01A1		0	61,056
Albuminuria and Incident chronic lung disease exacerbations in five population-based cohorts	93.837	5R21HL129924-02		0	58,615
Integrate gene expression data to characterize the contribution of rare genetic risk factors to structural birth defects	93.837	1R03HL147197-01		0	56,575
ABCA1/G1 and LXRs in Atherogenesis	93.837	2R01HL107653-09		0	53,988
Short Term Training Grant	93.837	5T35HL007616-39		0	51,387
Blood Pressure Measurement and Hypertension in Pregnancy	93.837	5K23HL136853-02		0	50,309
Investigation of Calcium Channel Modulation in Cardiomyocytes by Novel Methods	93.837	4R01HL113136-04		49,719	49,946
The role of impaired endothelium-dependent vasoactivity in neurodegeneration	93.837	5F30HL128023-04		0	49,524
Transcriptional Regulation of Macrophage Function by LXR in Atherosclerosis	93.837	5F30HL137327-02		0	49,524
Data-driven subtyping to find patients with drug interactions leading to stroke	93.837	5F30HL140946-02		0	49,524
Sculpting the ubiquitin status of KCNQ1 in cardiac health and disease	93.837	5F30HL140878-02		0	49,524
Modeling, pathogenesis and treatment of idiopathic pulmonary fibrosis	93.837	5U01HL134760-04		0	46,414
Molecular Regulation of Titin Elasticity by Post-Translational Modification	93.837	5F30HL129662-03		0	45,938
Characterization of Cardiac Behavior as a Function of Topology	93.837	5F30HL131383-03		0	45,470
Sigma-1 receptor activation on cardiac calcium channelopathy	93.837	5F31HL142239-02		0	44,524
Chronic obstructive pulmonary disease in non-smokers	93.837	5R01HL130506-03		0	38,971
Signaling Pathways and Regulators of Calcium Channels in Heart	93.837	1F31HL142178-01A1		0	37,025
BEST-DP: Biostatistics & Epidemiology Summer Training Diversity Program (BEGG/BOWMAN/MARCH)	93.837	5R25HL096260-10		0	33,470

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Defining the Role of Inc-TECRL in Maladaptive Cardiac Remodeling	93.837	1K08HL146964-01		0	31,834
JAK2V617F, clonal hematopoiesis and atherosclerosis	93.837	1R01HL148071-01		0	31,608
Postdoctoral Training in Arteriosclerosis Research	93.837	5T32HL007343-40		0	30,148
Gentrification, food environment, and risk for obesity: A mixed methods approach	93.837	5F31HL131441-04		0	29,116
Characterizing the Mechanisms of Cardiac Recovery Following Treatment with Exosomes Secreted by iPS Derived Cardiomyocytes	93.837	1F30HL145921-01		0	27,076
TTC39B in Metabolism	93.837	5R01HL119830-04		0	26,444
Injectable microtissues to promote rapid host re-perfusion of ischemic tissues	93.837	5R01HL141935-02		0	22,354
Modeling, pathogenesis and treatment of idiopathic pulmonary fibrosis	93.837	5U01HL134760-04		0	22,173
Lung epithelial cell specification in human pluripotent stem cells	93.837	1R01HL142727-01A1		0	19,025
Insulin Regulation of Reverse Cholesterol Transport	93.837	5F31HL132484-03		0	18,275
Familial hypercholesterolemia screening in children: population impact of phenotype, genotype, and cascade approaches	93.837	1R01HL141823-01A1		3,525	16,569
Modeling, pathogenesis and treatment of idiopathic pulmonary fibrosis	93.837	5U01HL134760-04		0	16,458
SCAN-MP (Screening for Cardiac Amyloidosiswith Nuclear imaging in Minority Populations)	93.837	1R01HL139671-01A1		0	10,029
Columbia University Training Program in Lung Science	93.837	5T32HL105323-09		0	8,948
Therapeutic Potential of Myocardial Soluble Guanylyl Cyclase Signaling in Right Ventricular Dysfunction	93.837	5R03HL133706-02		0	7,440
Translational Studies of ADAMTS7 a Novel GWAS Locus for Coronary Atherosclerosis	93.837	7R01HL111694-05		0	6,582
HDL-mediated cholesterol efflux and plaque inflammation in MESA	93.837	5R01HL127637-04		0	3,319
Gentrification, food environment, and risk for obesity: A mixed methods approach	93.837	5F31HL131441-04		0	2,800
L-type calcium channel trafficking and modulation in heart	93.837	5R01HL121253-04		0	1,858
Modeling, pathogenesis and treatment of idiopathic pulmonary fibrosis	93.837	5U01HL134760-04		0	1,802

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ror year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
L-type calcium channel trafficking and modulation in heart	93.837	5R01HL121253-04		0	1,101
Insulin action, reverse cholesterol transport, and HDL function	93.837	5R01HL125649-05		0	240
Postdoctoral Training in Cardiovascular Disease	93.837	5T32HL007854-24		0	147
Single molecules studies of titin elasticity	93.837	5R01HL061228-20		0	56
Postdoctoral Training in Cardiovascular Disease	93.837	5T32HL007854-24		0	7
Chronic obstructive pulmonary disease in non-smokers	93.837	5R01HL130506-03		0	-90
Depression Screening RCT in ACS patients: Quality of Life and Cost Outcomes	93.837	5R01HL114924-05		0	-185
Macrophage-specific function of GWAS CAD-associated LIPA alleles in atherosclerosis	93.837	5K99HL130574-02		0	-229
Cell-type Specificity of Heritable Channelopathies: Role of the Purkinje Fiber	93.837	5K08HL116790-05		0	-1,325
Mechanisms of Atherogenesis in Insulin Resistance	93.837	5P01HL087123-10		0	-2,293
Immune privilege of the hematopoleitic stem cell niche	93.837	5R01HL129506-04		0	-7,939
Training in Cardiovascular Translational Research	93.837	5T32HL120826-05		0	-8,794
Modeling, pathogenesis and treatment of idiopathic pulmonary fibrosis	93.837	5U01HL134760-04		0	-19,908
				\$3,323,973	\$35,994,642
Lung Diseases Research					
Subclinical Interstitial Lung Disease in MESA and FAR-ILD	93.838	5R01HL103676-07		113,489	704,002
Pulmonary microvascular perfusion in the Multi-Ethnic Study of Atherosclerosis	93.838	5R01HL077612-12		513,968	663,311
Mechanisms Controlling Expansion and Lineage Specification of Airway Progenitors in Development and Disease	93.838	5R35HL135834-03		0	539,178
Innate Immune Clearance of Host-Adapted Pulmonary Pathogens	93.838	5R35HL135800-03		0	480,252
Mechanisms Controlling Expansion and Lineage Specification of Airway Progenitors in Development and Disease	93.838	5R35HL135834-03		0	466,589

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Translating an Evidence-based Urban Asthma Program for Rural Adolescents: Testing Effectiveness & Cost-effectiveness and Understanding Factors Associated with Implementation	93.838	5R01HL136753-02		223,771	428,408
Mechanism of Respiratory SystemEsophageal Separation	93.838	5R01HL132996-03		0	393,871
Obstructive sleep apnea and subclinical lung injury in health and disease	93.838	5R01HL137234-02		102,674	370,858
Integration of omics data to improve interpretation of genetic risk variants in lung disease	93.838	5R01HL142028-02		153,675	312,687
Targeting airway smooth muscle chloride fluxes for bronchorelaxation	93.838	5R01HL122340-04		0	280,281
Innate Immune Clearance of Host-Adapted Pulmonary Pathogens	93.838	5R35HL135800-03		0	280,005
Pulmonary microvascular perfusion in the Multi-Ethnic Study of Atherosclerosis	93.838	5R01HL077612-12		207,691	251,051
PVDOMICS Defining the Future Fingerprints of Pulmonary Vascular Disease	93.838	5U01HL125218-05		131,109	232,138
Mitochondrial dynamics in acute lung injury	93.838	5R01HL122730-04		0	192,172
Host-pathogen interactions that promote carbapenem-resistantKlebsiella pneumoniae pulmonary infection	93.838	5K08HL138289-03		0	169,164
Smoke induced alterations in ion channel function	93.838	5K08HL126071-05		0	163,100
Mechanism of Respiratory SystemEsophageal Separation	93.838	5R01HL132996-03		0	162,487
Role of High Density Lipoproteins in Interstitial Lung Disease	93.838	5K23HL140199-02		0	159,358
Hypercoagulability and Chronic Lung Disease in Older Adults	93.838	5K23HL130627-04		0	149,625
Pulmonary Microvascular Blood Flow and Cor Pulmonale Parvus in Emphysema/COPD	93.838	5R01HL093081-08		118,243	138,895
Physical Activity and Dose of Air Pollution in Pediatric Urban Asthma:Impact of Minute Ventilation	93.838	5K01HL140216-02		0	137,594
Novel Quantitative Emphysema Subtypes in MESA and SPIROMICS	93.838	5R01HL121270-04		11,842	136,543
Pulmonary Complications in a Birth Cohort after a Randomized Trial of Antenatal Corticosteroids: the ALPS Follow-Up Study - Clinical Coordinating Center (ALPS-FS: CCC)	93.838	5R01HL098554-06		0	130,835
Immunobiology and alveolar physiology of the aging lung	93.838	1U01HL145547-01		0	127,125
GABAA Receptor-Mediated Modulation of Lung Inflammation	93.838	5K08HL140102-02		0	118,681

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
<del>-</del>	<u>01                                    </u>	110 001140	r dos-through contract Number	Oubrecipients	(Includes Subrecipients)
Gelsolin modulation of airway hyperresponsiveness and inflammation	93.838	5K08HL143052-02		0	118,41
Pulmonary microvascular perfusion in the Multi-Ethnic Study of Atherosclerosis	93.838	5R01HL077612-12		0	102,708
Antagonism of the Calcium -Activated Chloride Channel TMEM16A Beneficial Therapeutic Effects on Airway Epithelium and Smooth Muscle	93.838	5K08HL132203-03		0	102,336
Mentored Patient Oriented Research in Pulmonary Fibrosis and Lung Transplantation	93.838	5K24HL131937-03		0	99,973
Novel Quantitative Emphysema Subtypes in MESA and SPIROMICS	93.838	5R01HL121270-04		0	94,146
Breath stacking dyssynchrony in acute respiratory distress syndrome	93.838	5K23HL133489-04		0	79,868
PVDOMICS Defining the Future Fingerprints of Pulmonary Vascular Disease	93.838	5U01HL125218-05		65,054	78,82°
Subclinical Interstitial Lung Disease in MESA and FAR-ILD	93.838	5R01HL103676-07		0	71,003
Subclinical Interstitial Lung Disease in MESA and FAR-ILD	93.838	5R01HL103676-07		0	60,032
Subclinical Interstitial Lung Disease in MESA and FAR-ILD	93.838	5R01HL103676-07		0	54,503
Smoke Induced Airway Injury in the Lung	93.838	4R01HL086936-08		0	54,200
Lung resident niches for memory CD4 T cells	93.838	5R01HL116136-04		0	46,594
Subclinical Interstitial Lung Disease in MESA and FAR-ILD	93.838	5R01HL103676-07		0	15,64
Bioengineering a chimeric human lung	93.838	5R01HL120046-05		0	15,59°
Immunobiology and alveolar physiology of the aging lung	93.838	1U01HL145547-01		0	5,81
Subclinical Interstitial Lung Disease in MESA and FAR-ILD	93.838	5R01HL103676-07		0	4,368
TASK-1 Mutation as a Cause of Pulmonary Arterial Hypertension	93.838	5F30HL129656-03		0	-3,974
Innate Immune Clearance of Host-Adapted Pulmonary Pathogens	93.838	5R35HL135800-03		0	-7,888

National Heart, Lung, and Blood Institute/NIH/DHHS

For year ended June 30, 2019

For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Pulmonary Fibrosis and Telomerase Dysfunction	93.838	7R01HL093096-10		0	54,645
				\$1,641,516	\$8,234,999
Blood Diseases and Resources Research					
Neurocognitive effects of iron deficiency in blood donors.	93.839	1R01HL139489-01		17,742	744,200
Emergency Myelopolesis Pathways in the Control of Blood Production	93.839	5R35HL135763-03		0	593,852
Genetic characterization of osteoblast-induced leukemias	93.839	5R01HL130937-04		0	564,424
Mitochondrial regulation of hematopoietic stem cells	93.839	5R01HL135039-03		0	480,024
Regulation of hematopoietic stem cells and leukemia stem cells by thrombopoietin	93.839	5R01HL132074-03		0	369,998
Emergency Myelopolesis Pathways in the Control of Blood Production	93.839	5R35HL135763-03		0	222,352
N6-methyladenosine RNA modification regulates hematopoietic stem cell function	93.839	5F30HL142196-02		0	49,524
Local and systemic regulation of hematopoietic stem cells by thrombopoietin	93.839	5F30HL137323-03		0	44,524
Mechanisms Underlying Impaired Bacterial Clearance Following Transfusion of Storage-Damaged Red Blood Cells	93.839	5F31HL134284-02		0	20,963
The safety of red blood cell transfusions	93.839	5R01HL121275-04		0	12,091
Regulation of RBC Alloimmunization by Naturally Occurring and Adaptive Antibodies	93.839	7R01HL135248-03		0	9,000
Harmful effects of red blood cell transfusions are mediated by iron	93.839	4R01HL115557-04		0	-1,610
				\$17,742	\$3,109,342
Arthritis, Musculoskeletal and Skin Diseases Research					
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	590,961
Inflammation and Cardiovascular Disease in Rheumatoid Arthritis	93.846	5R01AR050026-14		90,189	510,240
Mechanisms of mechanosensory transduction in Merkel cells	93.846	5R01AR051219-14		127,441	456,296

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Incorporation of Dexamethasone Delivery within Engineered Cartilage	93.846	5R01AR068133-04		94,544	455,168
Rotator Cuff Degeneration and Repair	93.846	5R01AR057836-07		121,654	453,157
Adipose Inflammation in Rheumatoid Arthritis	93.846	5R01AR068425-03		96,999	438,332
Osteocyte Calcium and Contractile Dynamics in Facilitating the Expression of RANKL, OPG, and Sclerostin under Mechanical Loading	93.846	5R01AR069148-04		0	418,449
Enhanced Tendon Healing Through Growth Factor and Cell Therapies	93.846	5R01AR062947-07		191,252	390,727
Structure and mechanism of pemphigus autoantibodies	93.846	5R01AR073846-02		0	386,908
Meniscus Regeneration by Endogenous Stem/Progenitor Cells	93.846	5R01AR065023-05		90,465	382,238
Skeletal Microstructure-Racial Differences and Genetic Contributors	93.846	5R01AR071986-02		0	371,346
Osteochondroreticular (OCR) cells as sources of cartilage repair in Osteoarthritis	93.846	5R01AR069852-04		0	366,192
Pathogenesis of Emery-Dreifuss Muscular Dystrophy	93.846	5R01AR048997-15		0	356,851
Primary Cilia as Mechanotransducer in Bone	93.846	5R01AR062177-08		0	335,321
Mechanobiology of Inflammation in the Intervertebral Disc	93.846	5R01AR069668-03		19,492	318,003
Tendon Enthesis Development and Regeneration	93.846	5R01AR055580-10		0	317,049
Nuclear Movement LINC Complex and Emery-Dreifuss Muscular Dystrophy	93.846	5R01AR068636-05		41,572	273,408
Seamless Healing of Avascular Meniscus Tears by Stem Cell Recruitment	93.846	5R01AR071316-03		36,087	265,414
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	263,804
Functional Genomics of Alopecia Areata	93.846	5R01AR065963-04		0	251,876
Immunophenotyping of Lichen Planopilaris.	93.846	5R21AR073013-02		0	215,943
Nuclear Movement LINC Complex and Emery-Dreifuss Muscular Dystrophy	93.846	5R01AR068636-05		0	178,582
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	170,040

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Tendon Enthesis Development and Regeneration	93.846	5R01AR055580-10		0	164,517
Integrated Cartilage Repair	93.846	5R01AR073529-02		0	158,568
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	138,169
Functional Studies of the IL-7/IL-7R Pathway in Alopecia Areata	93.846	5K01AR070291-03		0	133,015
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	131,136
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	130,878
Inflammation and Cardiovascular Disease in Rheumatoid Arthritis	93.846	5R01AR050026-14		0	129,983
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	129,940
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	123,316
Activation of Human Skin T Cells by Mammalian and Microbial Lipids Presented by CD1a	93.846	5K01AR068475-05		0	116,494
Synthetic Developmental Tissue Engineering of Human Hair Follicles	93.846	5K01AR072131-03		0	112,699
Inflammation in Rotator Cuff Tear and Repair	93.846	7K08AR072092-03		0	91,834
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	85,712
Mechanisms of mechanosensory transduction in Merkel cells	93.846	5R01AR051219-14		0	73,295
Muscle regulation of bone function	93.846	1R01AR073180-01A1		0	72,465
Primary Cilia as Mechanotransducer in Bone	93.846	5R01AR062177-08		0	72,165
Incorporation of Dexamethasone Delivery within Engineered Cartilage	93.846	5R01AR068133-04		0	69,258
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	66,385
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	61,904
Functional Genomics of Alopecia Areata	93.846	5R01AR065963-04		0	60,966

For year ended June 30, 2019

·					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	58,933
Mechanobiology of Inflammation in the Intervertebral Disc	93.846	5R01AR069668-03		0	56,143
Épigenetic control of target gene activity by hairless in skin homeosasis	93.846	5K01AR064315-05		0	54,138
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	52,873
Molecular and Therapeutic Mechanisms of a new model of Congenital Muscular Dystrophy	93.846	5F31AR070013-04		0	49,524
Laser Treatment Modality for Strengthening Osteoarthritic Cartilage	93.846	1R01AR073289-01A1		0	41,682
Laser Treatment Modality for Strengthening Osteoarthritic Cartilage	93.846	1R01AR073289-01A1		0	40,711
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	38,929
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	31,036
Alopecia Areata Center for Research Translation (AACORT)	93.846	5P50AR070588-03		0	22,289
Incorporation of Dexamethasone Delivery within Engineered Cartilage	93.846	5R01AR068133-04		0	22,272
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	21,837
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	18,697
Eleventh Forum on Osteoporosis and Metabolic Bone Diseases for Fellows in Training	93.846	1R13AR072506-01		0	18,000
12th Fellows Forum on Osteoporosis and Metabolic Bone Diseases	93.846	1R13AR074280-01		0	18,000
Columbia University Skin Disease Resource-Based Center (epiCURE)	93.846	5P30AR069632-04		0	14,158
Role of secreted phospholipase A2 in the activation of human CD1-restricted T cells	93.846	1R01AR074037-01A1		0	4,337
Developing an Alopecia Areata Disease Activity Index (ALADIN)	93.846	5U01AR067173-03		0	528
Tendon Enthesis Development and Regeneration	93.846	5R01AR055580-10		0	80
The Osteoblast as a Determinant of Leukemogenesis	93.846	5R01AR054447-10		0	-11,723

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

· · · · · · · · · · · · · · · · · · ·					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Developing an Alopecia Areata Disease Activity Index (ALADIN)	93.846	5U01AR067173-03		0	-34,009
				\$909,695	\$10,807,439
Diabetes, Digestive, and Kidney Diseases Extramural Research					
Clinical Research on Nonalcoholic Fatty Liver Disease	93.847	5U01DK061734-17		820,438	1,202,513
Genomics of mammalian posterior urethral valves	93.847	5R01DK115574-03		36,000	873,677
Advancing Clinical Research in Primary Glomerular Diseases	93.847	5UM1DK100876-06		70,470	859,911
Role of Forkhead Proteins in Insulin Action	93.847	5R01DK057539-19		0	687,882
The molecular genetic analysis of human obesity	93.847	5R01DK052431-24		0	686,694
Genetics of IgA nephropathy by integrative network-based association studies	93.847	5R01DK105124-05		102,445	681,341
Mechanisms of Beta Cell Failure	93.847	5R01DK064819-17		0	669,742
Mouse Models of Insulin Resistance	93.847	5R37DK058282-20		0	613,619
Retinoic acid signaling controls urothelial development and regeneration.	93.847	5R01DK095044-07		0	604,680
Elucidating IgA nephropathy through Genetic Studies of IgA1 Glycosylation	93.847	5R01DK082753-09		322,018	553,245
ADIPOSE TISSUE MACROPHAGE PHENOTYPE AND FUNCTION	93.847	5R01DK066525-16		0	535,616
CSF Neuropeptide, Hormonal and Metabolomic Analysis in Human Energy	93.847	5R01DK093920-08		0	525,662
Metabolic and Endocrine Effects of Bariatric Surgery	93.847	5R01DK072011-13		0	511,259
New approaches to the evaluation and treatment of acromegaly	93.847	5R01DK110771-03		0	477,712
Notch function in postnatal intestinal and mesenteric lymphatics	93.847	5R01DK107633-02		155,107	470,121
Bile acids and insulin sensitivity	93.847	1R01DK115825-01A1		0	467,933
Genomics of glomerular disease	93.847	5RC2DK116690-02		113,518	429,245

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Significance of Intrarenal T cells in SLE Nephritis	93.847	5R01DK106436-04		0	424,820
Ecological dynamics and metabolic interactions in gut microbiome across space and time	93.847	5R01DK118044-02		0	419,982
Notch, Type 2 Diabetes and NAFLD	93.847	5R01DK103818-05		0	407,581
PPARgamma Deacetylation in the Restoration of Metabolic Homeostasis	93.847	5R01DK112943-02		0	402,629
Genetics of Human Renal Hypodysplasia	93.847	5R01DK080099-09		143,029	401,880
Genetics of Congenital Obstructive Uropathy	93.847	5R01DK103184-05		4,577	397,478
Clinical Research on Nonalcoholic Fatty Liver Disease	93.847	5U01DK061734-17		377,513	397,346
Mechanisms Underlying Predictors of Success from Obesity Surgery	93.847	5R01DK108643-05		169,591	388,694
Regulation of glucose uptake in osteoblasts by Runx2	93.847	5R01DK104727-05		0	387,064
Mechanisms of Mucosal Th17 Cell Induction By Segmented Filamentous Bacteria	93.847	2R01DK098378-06A1		0	386,810
THE FUNCTION AND REGULATION OF HISTIDINE DECARBOXYLASE IN GUT INFLAMMATION	93.847	5R01DK048077-23		0	384,290
Amitosis of Polyploid Cells to Functional Intestinal Stem Cells	93.847	5R01DK107702-04		0	379,343
Imaging beta cell function for metabolic surgery	93.847	5R01DK104740-05		0	375,525
Immune response to iPSC-derived beta cells in Type 1 diabetes	93.847	5R01DK103585-04		0	369,567
Circadian clock regulation of branching morphogenesis during kidney development	93.847	5R01DK106548-04		0	361,888
VZV in the enteric nervous system: pathogenesis and consequences	93.847	5R01DK093094-07		28,278	361,445
Postprandial Vitamin A	93.847	5R01DK068437-14		0	360,479
Mice with autologous human T1D-derived immune systems and iPSC-derived beta cell	93.847	1UC4DK104207-01		0	359,191
TAZ and YAP in Non-Alcoholic Steatohepatitis and its Complications	93.847	5R01DK116620-02		0	356,555
Function and regulation of progastrin receptors on intestinal progenitors	93.847	5R37DK052778-21		0	354,302

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
HORMONES: BIOCHEMISTRY AND MOLECULAR BIOLOGY	93.847	5T32DK007328-40		0	352,475
Primary Hyperparathyroidism	93.847	5R01DK032333-33		0	347,035
Metabolomic Biomarkers Predictors of Long-term Success Following Bariatric surgery	93.847	5R01DK108580-04		181,546	346,172
Barrett's esophagus and progenitor cells at the squamous-columnar junction	93.847	5R01DK113144-03		39,223	338,195
The impact of glomerular disorders on bone quality and strength	93.847	5R01DK119266-02		162,579	334,359
Purinergic signaling in granuloma forming Th2 immunity	93.847	5R01DK113790-04		170,717	330,515
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	323,519
TAZ and YAP in Non-Alcoholic Steatohepatitis and its Complications	93.847	5R01DK116620-02		0	315,823
GÉNERATING AN ATLAS OF THE DÉVÉLOPING HÚMAN ÚRINARY OUTFLOW TRÁCT.	93.847	5U01DK110803-04		23,011	311,538
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	301,320
Trafficking-Dependent Signaling of Pain by Protease-Activated Receptors	93.847	5R01DK118971-02		101,381	297,436
Basal Progenitor Cells and Eosinophilic Esophagitis	93.847	5R01DK100342-06		0	294,479
Increasing Minority Population Awareness through Community Teaching for Improved Organ Donation (IMPACT for Improved Organ Donation)	93.847	5R01DK114893-03		0	292,901
Graduate Training in Nutrition	93.847	5T32DK007647-30		0	281,318
Training Program in Endocrinology and Metabolism	93.847	5T32DK007271-40		0	278,421
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	271,000
Long term change of GLP-1 insulinotropic effect after GBP surgery	93.847	5R01DK098056-04		0	269,392
Role of Dach1 in Obesity-Induced Hepatic Insulin Resistance	93.847	5R01DK106045-04		0	269,024
The molecular genetic analysis of human obesity	93.847	5R01DK052431-24		0	268,583
Understanding the Role of a Long Noncoding RNA in Celiac Disease	93.847	5R01DK102180-05		0	268,475

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Branching Morphogenesis of Urinary Epithelia: from Genes to Cellular Behaviors	93.847	5R01DK083289-10		0	266,920
Vitamin A Homeostasis: Retinyl Ester Stores	93.847	5R01DK101251-03		70,970	261,305
New York Obesity Research Center	93.847	5P30DK026687-39		0	242,113
New York Obesity Research Center	93.847	5P30DK026687-39		0	241,343
Multidisciplinary Training in Translational Gastrinointestinal and Liver Research	93.847	5T32DK083256-10		0	230,132
Paneth cells and acute kidney injury	93.847	5R01DK109544-03		0	225,686
Role of Autophagy in Maladaptive Renal Repair Following Acute Kidney Injury	93.847	5R01DK107653-03		0	219,238
The Intraepithelial T cell Response in Celiac Disease	93.847	5K08DK100739-06		0	215,425
New York Obesity Research Center	93.847	5P30DK026687-39		129,105	209,648
Peptidylarginine deiminase-4 and acute kidney injury	93.847	5R01DK115694-03		0	206,225
Prebiotic GOS and lactoferrin for beneficial gut microbiota with ironsupplements	93.847	5R01DK115449-02		0	202,859
09/16 Action for Health in Diabetes Extension Study Research Project	93.847	5U01DK057178-21		0	197,768
Training Grant in Pediatric Endocrinology, Diabetes and Metabolism	93.847	5T32DK065522-15		0	194,699
Improving Diagnosis and Prevention of Pediatric Nonalcoholic Fatty Liver Disease	93.847	5K23DK115682-02		0	185,842
Bacterial Translocation and the Intestinal Microbiome in Recurrent Disease Following Liver Transplantation	93.847	5K23DK101827-04		0	178,916
Targeting the Microenvironment in Gastric Chemoprevention	93.847	5K08DK100544-05		0	178,662
13/22 Diabetes Prevention Program Outcomes Study (DPPOS) Phase 3 - Research Project	93.847	5U01DK048404-26		0	178,489
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	177,059
A New Therapeutic Option for the Treatment of Prolactinomas	93.847	5R21DK112093-03		0	176,597
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	171,276

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	169,524
Écological dynamics and metabolic interactions in gut microbiome across space and time	93.847	5R01DK118044-02		0	167,577
Functional imaging and eating behavior among FTO genotypes in pre-obeses children	93.847	5R01DK097399-05		77,761	165,717
New York Obesity Research Center	93.847	5P30DK026687-39		22,305	162,696
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	154,951
09/16 Action for Health in Diabetes Extension Study Research Project	93.847	5U01DK057178-21		0	141,192
Epigenetic Regulation by FoxO1 in Pancreatic Beta Cells	93.847	5K01DK114372-02		0	141,142
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	140,384
Kidney Precision Medicine Program (KPMP): Columbia AKI RecruitmentSite	93.847	4UH3DK114926-03		0	140,167
Jagged-Notch signaling in NASH/fibrosis	93.847	1R01DK119767-01		0	139,591
Basal Progenitor Cells and Eosinophilic Esophagus	93.847	2R01DK100342-07		0	139,034
Lifestyle Interventions in Overweight and Obese Pregnant Women	93.847	5U01DK094463-06		0	136,372
Precision Medicine Research in Nephrology	93.847	5T32DK108741-04		0	135,476
Advancing Clinical Research in Primary Glomerular Diseases	93.847	5UM1DK100876-06		0	135,000
Genetics of early childhood obesity and its clinical implications	93.847	5K23DK110539-05		0	134,913
Loss of Gastrointestinal Colonization Resistance and Antibiotic-Resistant infections in the ICU	93.847	5K23DK111847-03		0	128,991
Hepatoprotective Mechanisms of TTC39B Deficiency	93.847	5K01DK114380-02		0	128,351
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	118,712
13/22 Diabetes Prevention Program Outcomes Study (DPPOS) Phase 3 - Research Project	93.847	5U01DK048404-26		0	117,449
Differentiating Radio-sensitivities Among Intestinal Stem Cell Pools	93.847	5U01DK103155-05		11,795	115,670

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Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
IGFBP-Mediated Local and Systemic Effects of Mitochondrial Dysfunction in Skeletal Muscles	93.847	5R21DK112074-03		0	(Includes Subrecipients) 106,113
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	104,498
2/2 APOL1 Long-Term Kidney Transplantation Outcomes Network- Clinical Center	93.847	5U01DK116066-03		21,602	104,228
Aptamer-Based Arrays for Detection of Pathogenic IgA1 O-Glycoforms in IgA Nephropathy	93.847	5R21DK109690-02		1,829	91,299
Mice with autologous human T1D-derived immune systems and iPSC-derived beta cell	93.847	1UC4DK104207-01		0	90,325
MerTK in NASH-related liver fibrosis	93.847	5K99DK115778-02		0	88,66
Differentiating Radio-sensitivities Among Intestinal Stem Cell Pools	93.847	5U01DK103155-05		66,855	86,718
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	86,25
Columbia Diabetes Research Center	93.847	5P30DK063608-17		49,960	85,104
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	81,026
New York Obesity Research Center	93.847	5P30DK026687-39		0	80,000
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	79,672
Immune regulation of adipose tissue mass	93.847	5R01DK101942-04		0	79,520
Enteroendocrine Cell Subsets with Reserve Stem Cell Function	93.847	5R03DK114656-02		0	79,489
Generation of New Mouse Models of Low Nephron Numbers to Understand Pathogenesis of AKland CKD in Humans Born Preterm	93.847	1R01DK118140-01A1		0	77,622
Metabolic and Endocrine Effects of Bariatric Surgery	93.847	5R01DK072011-13		0	76,234
Enteric Neuronal Development as a Determinant of Intestinal Inflammation	93.847	5K08DK093786-05		0	75,61
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	66,987
Diabetes disparities in Latino sub populations: linking biology to social epidemiology	93.847	5K01DK107791-04		0	66,458
Immune response to iPSC-derived beta cells in Type 1 diabetes	93.847	5R01DK103585-04		0	66,032

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Differentiating Radio-sensitivities Among Intestinal Stem Cell Pools	93.847	5U01DK103155-05		30,330	65,567
New York Obesity Research Center	93.847	5P30DK026687-39		0	65,256
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	55,604
Discovery and fine mapping of susceptibility loci for IgA nephropathy	93.847	4R01DK095510-05		54,792	54,792
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	54,047
13/22 Diabetes Prevention Program Outcomes Study (DPPOS) Phase 3 - Research Project	93.847	5U01DK048404-26		0	50,522
Analysis of beta cell dedifferentiation using scRNA-seq of human T2D	93.847	5F32DK117574-02		0	49,939
Nuclear Envelope, Lipoprotein Metabolism, and Hepatic Steatosis	93.847	1R01DK118480-01A1		0	49,840
The Rewarding Value of Sugar in the Absence of Sweet Taste	93.847	5F30DK108564-05		0	49,524
Mechanisms of Mucosal Th17 Cell Induction By Segmented Filamentous Bacteria	93.847	5R01DK098378-05		0	49,463
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	48,106
Bile acids and insulin sensitivity	93.847	5R01DK115825-02		0	46,451
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		30,262	45,262
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	45,236
Engineering Nanobodies To Study Beta Subunit-Specific Voltage-Gated Calcium Channel Complexes in Pancreatic Beta Cells	93.847	5F31DK118866-02		0	44,524
Characterizing the Dedifferentiating Beta Cell in Diabetes	93.847	5F30DK112518-03		0	42,569
Training Program in Endocrinology and Metabolism	93.847	5T32DK007271-40		0	40,312
Novel genetic engineering tools for functional studies of the gut microbiome	93.847	5F30DK111145-03		0	38,992
Training Medical Students in NIDDK Research	93.847	5T35DK093430-08		0	38,784
Enteric Glia, Sexual Dimorphism and Gl Motility	93.847	5K08DK110532-03		0	38,526

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					R&D Cluster
ederal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Novel genomic and transcriptomic tools to study human congenital anomalies of the kidney and urinary tract	93.847	5P20DK116191-02		0	36,59
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	34,18
New York Obesity Research Center	93.847	5P30DK026687-39		0	32,84
Training Program in Endocrinology and Metabolism	93.847	5T32DK007271-40		0	32,206
Obesity Research Center Training Grant	93.847	5T32DK007559-29		0	31,85
Nuclear Envelope, Lipoprotein Metabolism, and Hepatic Steatosis	93.847	1R01DK118480-01A1		0	31,669
ĞÊNÊRATING AN ATLAS OF THE DEVELOPING HUMAN ÜRINARY ÖÜTFLÖW TRACT.	93.847	5U01DK110803-04		0	29,114
Dynamically Tailoring Interventions for Problem-Solving in Diabetes Self-Management Using Self-Monitoring Data - a Randomized Controlled Trial	93.847	1R01DK113189-01A1		0	28,674
Training Medical Students in NIDDK Research	93.847	5T35DK093430-08		0	26,604
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	25,87
New York Obesity Research Center	93.847	5P30DK026687-39		0	25,130
Öbesity Research Center Training Grant	93.847	5T32DK007559-29		0	24,868
Utility of Genomic Diagnostics for Chronic Kidney Disease	93.847	5F30DK116473-02		0	24,762
New York Obesity Research Center	93.847	5P30DK026687-39		0	23,548
TAZ and YAP in Non-Alcoholic Steatohepatitis and its Complications	93.847	5R01DK116620-02		0	22,995
The Rewarding Value of Sugar in the Absence of Sweet Taste	93.847	5F30DK108564-05		0	22,552
Body Composition and REE Responses to Bariatric Surgeries	93.847	7R01DK072507-08		3,530	21,872
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	21,486
Genetic and Molecular Etiology of Developmental Kidney and Urinary Tract Abnormalities in the DiGeorge, or 22q11.2, Syndrome.	93.847	1F32DK121454-01		0	20,84
Novel genomic and transcriptomic tools to study human congenital anomalies of the kidney and urinary tract	93.847	5P20DK116191-02		0	20,765

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Brown Remodeling of White Adipose Tissue by Ppargamma Deacetylation	93.847	5R00DK097455-05		0	18,513
Differentiating Radio-sensitivities Among Intestinal Stem Cell Pools	93.847	5U01DK103155-05		13,689	17,430
The role of long noncoding RNAs in regulating pancreas development and function	93.847	5F31DK107028-03		0	16,852
The Columbia PCC for CureGN: the Cure Glomerulonephropathy network	93.847	2U01DK100876-07		0	16,722
2/2 APOL1 Long-Term Kidney Transplantation Outcomes Network- Clinical Center	93.847	5U01DK116066-03		11,200	16,148
Mice with autologous human T1D-derived immune systems and iPSC-derived beta cell	93.847	1UC4DK104207-01		0	13,086
Rare variant analysis of glomerulonephritis	93.847	1K01DK119549-01		0	12,980
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	12,955
New York Obesity Research Center	93.847	5P30DK026687-39		6,226	11,159
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	10,785
New York Obesity Research Center	93.847	5P30DK026687-39		0	10,571
New York Obesity Research Center	93.847	5P30DK026687-39		0	10,201
Advances in Motility and in Gastroenterology-AIMING for the future- NASPGHAN Conference	93.847	1R13DK120291-01		0	8,000
RBP2 Biology and Pathobiology	93.847	1R01DK122071-01		0	7,949
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	7,865
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	7,167
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	6,566
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	5,846
Obesity Research Center Training Grant	93.847	5T32DK007559-29		0	4,881
Precision Medicine Research in Nephrology	93.847	5T32DK108741-04		0	4,534

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Characterizing the Dedifferentiating Beta Cell in Diabetes	93.847	5F30DK112518-03		0	3,896
Graduate Training in Nutrition	93.847	5T32DK007647-30		0	3,084
Signaling Mechanisms Promoting Barrett s Metaplasia	93.847	1R01DK120650-01		0	2,797
Aptamer-Based Arrays for Detection of Pathogenic IgA1 O-Glycoforms in IgA Nephropathy	93.847	5R21DK109690-02		0	2,176
The Genetic Origins and Complications of Urinary Tract Abnormalities	93.847	5U54DK104309-05		0	2,044
Advancing Clinical Research in Primary Glomerular Diseases	93.847	5UM1DK100876-06		0	1,134
Columbia Diabetes Research Center	93.847	5P30DK063608-17		0	365
Role of the Kidney in Iron Balance	93.847	5F31DK105799-03		0	195
Training Program in Endocrinology and Metabolism	93.847	5T32DK007271-40		0	57
Training Grant in Pediatric Endocrinology, Diabetes and Metabolism	93.847	5T32DK065522-15		0	-569
ĠĖNĖRATING AN ATLAS OF THE DEVELOPING HUMAN URINARY OUTFLOW TRACT.	93.847	5U01DK110803-04		0	-704
Clinical Research on Nonalcoholic Fatty Liver Disease	93.847	5U01DK061734-17		0	-759
Clinical Research on Nonalcoholic Fatty Liver Disease	93.847	5U01DK061734-17		0	-800
Genetics of Congenital Obstructive Uropathy	93.847	5R01DK103184-05		0	-875
13/22 Diabetes Prevention Program Outcomes Study (DPPOS) Phase 3 - Research Project	93.847	5U01DK048404-26		0	-1,137
ĠĖNĖRATING AN ATLAS OF THE DĖVĖLOPING HUMAN ŪRINARY OUTFLOW TRACT.	93.847	5U01DK110803-04		0	-2,045
HÖRMONES: BIOCHEMISTRY AND MOLECULAR BIOLOGY	93.847	5T32DK007328-40		0	-4,050
The Rewarding Value of Sugar in the Absence of Sweet Taste	93.847	5F30DK108564-05		0	-22,552
09/16 Action for Health in Diabetes Extension Study Research Project	93.847	5U01DK057178-21		0	-27,425
Diabetes and Endocrinology Research Center	93.847	5P30DK063608-15		0	-29,056

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For year ended Julie 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Diabetes and Endocrinology Research Center	93.847	5P30DK063608-15		0	-30,750
TLR4 in Obesity-Driven Liver Fibrosis	93.847	5R03DK101863-03		0	-43,210
Kidney Precision Medicine Program (KPMP): Columbia AKI RecruitmentSite	93.847	4UH3DK114926-03		0	-153,632
				\$3,623,652	\$34,694,791
Extramural Research Programs in the Neurosciences and Neurological Disor	ders				
AtRial Cardiopathy and Antithrombotic Drugs In prevention After cryptogenic stroke (ARCADIA)	93.853	5U01NS095869-02		1,745,441	2,104,039
Identification of Susceptibility Genes for Essential Tremor	93.853	5R01NS073872-07		875,289	1,417,145
Genetic Determinants of Epilepsy in Murine Systems	93.853	5R37NS031348-28		0	876,848
Identification and molecular characterization of somatic mutations in MCD	93.853	5R01NS094596-04		414,338	792,746
Mechanisms of Axon Pathology in ALS	93.853	5R01NS107442-02		45,192	747,260
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		69,302	723,063
Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial - Hemodynamics (CREST-H)	93.853	5R01NS097876-03		610,756	681,906
Patient-Based Structural Biology of Tauopathies and TDP-43 Proteinopathies using Cryo-ElectronMicroscopy and Mass Spectrometry	93.853	5U01NS110438-02		272,162	658,261
MicroRNA modulation of tau expression and phosphorylation in tauopathy	93.853	5R01NS095922-04		0	653,843
Cellular and molecular mechanisms underlying the function of SRGAP2 during synaptic development	93.853	5R01NS067557-10		0	622,183
Dynamic Neural Mechanisms of Audiovisual Speech Perception	93.853	5U01NS098976-03		205,103	609,762
Targeting Lewy Body Specific Pathology Using Biomarkers	93.853	5U01NS100600-04		9,051	598,342
MÍCROENVIRONMENT IN ENTERIC NEURON DEVELOPMENT	93.853	5R01NS015547-36		0	594,292
Statewide dissemination of a school-based public stroke education intervention	93.853	5R01NS067443-09		171,432	563,806
RNA-mediated mechanisms of motor system dysfunction in spinal muscular atrophy	93.853	5R01NS102451-03		0	546,266

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Autophagy and Neurodegeneration	93.853	5R01NS063973-10		325,725	536,925
Psychosocial Impact of Genetics in Epilepsy	93.853	5R01NS104076-02		21,194	518,203
Mechanisms of spatial memory during navigation in virtual reality	93.853	5R00NS093071-05		0	489,554
Development and function of an adult locomotion circuit in Drosophila	93.853	5R01NS070644-10		0	468,509
Endosomal Platforms for Neuropeptide Receptor Signaling	93.853	5R01NS102722-03		0	443,116
Autoimmune features of neurodegenerative disorders	93.853	5R01NS095435-02		203,390	440,754
SCAPE microscopy for high-speed in-vivo volumetric microscopy in behaving organisms	93.853	5U01NS094296-03		0	440,487
Chemical Biology of Tau Missorting in Alzheimers Disease	93.853	5R21NS109887-02		0	425,526
The role of CA2 in epilepsy and social comorbidity	93.853	5R01NS106983-02		95,987	423,248
Structure and Function of AMPA subtype ionotropic glutamate receptors	93.853	5R01NS083660-07		118,485	422,889
RNA Binding Proteins in Complex Neurological Disease	93.853	5R01NS091118-05		81,289	420,431
Mechanisms of Central Synaptic Dysfunction in SMA	93.853	5R01NS078375-07		0	420,309
SCAPE microscopy for high-speed 3D imaging of cellular function in behaving animals: Continued innovation, optimization, and dissemination	93.853	1UF1NS108213-01		54,748	414,412
The Neuropeptidergic Connectome of Caenorhabitis Elegant	93.853	5R01NS110391-02		136,134	414,126
Prevalence and predictors of asymptomatic atrial fibrillation in the community	93.853	5R01NS083784-05		13,331	406,438
Mechanisms of measles virus CNS adaptation	93.853	5R01NS091263-05		176,237	405,009
The behavioral functions of upper and lower cortical layers	93.853	5R01NS094659-03		0	403,804
CRCNS: Understanding flexible neural computations in the motor cortex	93.853	5R01NS100066-03		0	400,868
Mechanisms for Internal Models in a Cerebellum-like Circuit	93.853	5R01NS075023-08		0	396,138
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	385,363

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		0	384,440
The role of ApoE in injury-induced neurogenesis	93.853	5R01NS095803-03		0	382,386
The Role of Clustered Protocadherins in Neurite Self-avoidance	93.853	5R01NS088476-04		0	382,328
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		359,859	375,359
In-vivo optical imaging of neurovascular coupling and cerebral metabolism	93.853	5R01NS063226-10		0	360,934
Development of therapeutic fusion inhibitor peptides for Measlesencephalitis	93.853	5R01NS105699-02		0	354,386
The Role of Dendrites in Thalamocortical Circuitry	93.853	5R01NS069679-09		0	353,790
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		0	352,827
Dual Inhibition of Mitochondrial Matrix Chaperones and Anti-Apoptotic Bcl-2 Family Members for Glioblastoma Therapy.	93.853	5R01NS095848-03		0	350,532
Mitochondrial complex-I as a target for metab	93.853	5R01NS100850-02		20,507	349,348
Influence of genotype on microglia phenotype and function in PD	93.853	5R01NS089674-04		112,966	327,517
RNA regulatory networks in motor neuron development and function	93.853	5R01NS089676-05		0	326,992
Dynamics of long range network interactions in focal epilepsy	93.853	5R01NS084142-07		0	321,884
Targeting Mutant IDH1 for a Novel Synthetic Lethal Interaction in Malignant Gliomas	93.853	5R01NS102366-02		0	321,364
Mitochondrial Dysfunction and White Matter Injury	93.853	5R01NS099109-04		0	318,618
FUS Gain-of-Function Mechanisms in Animal and Cellular Models of ALS	93.853	2R56NS073776-06A1		0	316,889
Identification of the initial cellular site of action of a-synuclein in the pathogenesis of Parkinson's disease in vivo.	93.853	5R01NS102172-02		0	315,000
Single-particle cryo-EM characterization of AMPA receptor functional states	93.853	5R01NS107253-02		0	307,212
Neurology Research Education and Mentorship Program	93.853	5R25NS070697-10		0	302,706
Clinical Research Sites for the Network of Excellence in Neuroscience Clinical Trials (NeuroNEXT sites) (U24)	93.853	5U24NS107168-02		15,934	301,253

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Dendritic patterning by interacting extrinsic cues	93.853	5R01NS061908-12		0	300,361
Selective autophagy in Parkinson's disease	93.853	5R01NS101663-02		24,604	298,575
Neuron death in Parkinson's disease: The role of Trib3	93.853	2R01NS072050-06A1		0	296,993
CRCNS: Refining computational models of motor sequence learning and execution	93.853	5R01NS105349-03		197,472	293,565
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	286,499
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	285,221
Spinal muscular atrophy: Mechanisms and treatment strategies.	93.853	1R56NS104218-01		0	284,248
A transcription factor complex specifically induced in neurodegeneration	93.853	5R01NS109607-02		0	276,289
Cerebellar Circuitry in the Pathophysiology of Tremor	93.853	5R01NS104423-02		10,000	270,722
Omega 3 Fatty Acids Acute Neuroprotection via Mitochondria	93.853	5R01NS088197-05		0	268,448
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		239,899	255,399
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		105,178	254,040
Targeting Lewy Body Specific Pathology Using Biomarkers	93.853	5U01NS100600-04		58,351	253,801
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	240,988
The regulations of beta-amyloid sensitivity and Alzheimer s related impairments by PP2A	93.853	5R01NS092045-05		49,198	235,387
Motor cortex electrical stimulation to augment spontaneous recovery after chronicsubcortical stroke	93.853	7R01NS092875-05		0	234,953
Functional data analytics for kinematic assessments of motor control	93.853	5R01NS097423-04		92,450	232,396
Statistical methods for early disease prediction and treatment strategy estimation using biomarker signatures	93.853	5R01NS073671-07		85,053	231,854
Dynamic Neural Mechanisms of Audiovisual Speech Perception	93.853	5U01NS098976-03		122,918	223,761
Motor neuron selector genes and mechanism of their action	93.853	2R56NS078097-06		47,392	221,861

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
AtRial Cardiopathy and Antithrombotic Drugs In prevention After cryptogenic stroke (ARCADIA)	93.853	5U01NS095869-02		189,706	221,488
The striatal cholinergic interneurons in Parkinson's disease and treatment	93.853	5R01NS101982-02		0	218,395
Stroke Trials Network of Columbia and Cornell	93.853	5U24NS107237-02		0	218,232
Distal enhancers controlling motor neuron gene expression program	93.853	1R01NS109217-01		0	211,863
A molecular map of the electrical connectome of C. elegans	93.853	5R21NS106909-02		0	210,499
Statewide dissemination of a school-based public stroke education intervention	93.853	5R01NS067443-09		11,729	209,111
Cortical localization in epilepsy	93.853	5R01NS035140-17		0	207,972
Assessment and characterization of naming in older adults with epilepsy	93.853	5R01NS083976-05		0	207,896
Advanced Graduate Training Program in Neurobiology and Behavior	93.853	5T32NS064928-09		0	205,237
A nervous system-wide analysis of C. elegans homeobox gene function	93.853	5R21NS106843-02		0	204,518
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	202,214
Neuroepidemiology Training Program	93.853	5T32NS007153-35		0	198,588
Single cell analysis of the infiltrative margins of glioblastoma and post-treatment recurrence	93.853	5R01NS103473-03		0	198,296
Spinal muscular atrophy: Mechanisms & treatment strategies.	93.853	1R01NS104218-01A1		0	196,455
Overcoming apoptotic resistance in glioblastoma by CP-d/n-ATF5, a novel tumor specific therapeutic compound targeting the transcription factor ATF5	93.853	5K08NS083732-04		0	189,822
Making the Invisible Visible: Advanced MRI in Non Lesional Focal Epilepsy	93.853	5R21NS101303-02		99,786	185,239
SMN post-translational modification in Spinal Muscular Atrophy	93.853	5R21NS101575-02		0	183,533
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		6,863	171,050
Omega 3 Fatty Acids Acute Neuroprotection via Mitochondria	93.853	5R01NS088197-05		0	168,394
Examination of the earliest symptoms and biomarkers of FTLD MAPT carriers	93.853	4R01NS076837-05		10,487	164,364

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
An internal sensory circuit for neuropeptide control of body homeostasis	93.853	5R21NS105507-02		0	161,489
The Spinal Muscular Atrophy NMJ phenotype: mechanisms and molecular mediators	93.853	1R21NS099921-01A1		0	160,963
Sexually dimorphic regulation of neuronal identity in C.elegans	93.853	5R37NS039996-18		0	160,119
Clinical Impact of Early Pathogen Identification in Acute Neurological Infections	93.853	5K23NS105935-02		0	155,444
Mechanisms Linking Hearing Loss and Alzheimer s Disease and Related Dementias	93.853	5K23AG057832-02		0	155,064
Non-cell Autonomous Role of Synuclein in Neurodegeneration	93.853	5R21NS099862-03		0	154,355
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	154,342
CRCNS: Modeling the Nanophysiology of Dendritic Spines	93.853	5R01NS110422-02		0	153,913
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		68,676	150,154
Neurotrophins, spontaneous release, and synaptic growth cascades	93.853	5R01NS083690-05		0	147,977
Single cell analysis of the infiltrative margins of glioblastoma and post-treatment recurrence	93.853	5R01NS103473-03		0	145,310
Seizure localization in humans: the effect of inhibitory suround on the EEG	93.853	5R01NS084142-05		88,911	137,564
Advanced Graduate Training Program in Theoretical Neuroscience	93.853	5T32NS064929-10		0	133,137
Pathological striatopallidal neuronal ensembles in learned motor impairment in PD	93.853	1R01NS107734-01		0	131,414
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	131,347
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		111,530	127,030
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		114,413	120,752
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		0	117,492
Discovery of Novel Molecular Abnormalities Underlying Non-Lesional Focal Epilepsy	93.853	5R01NS089552-04		21,782	114,876
The role of SUMOylation in Tau-mediated pathology	93.853	1R01NS110024-01		18,525	114,578

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Targeting cortical microglia to treat neuropathic pain	93.853	5R21NS106469-03		0	109,205
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	106,762
Molecular correlates of proprioceptor subtype identity	93.853	1R01NS106715-01A1		0	103,385
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		48,655	103,102
SMN dysfunction in FUS-dependent ALS	93.853	5R21NS099977-02		0	101,972
The Role of p38 MAPK Activation in Spinal Muscular Atrophy	93.853	5R21NS098363-02		0	85,795
Dissecting the role of dorsomedial striatal circuits in action selectionduring spatial exploration	93.853	5K99NS107721-02		0	84,885
The role of the human-specific gene SRGAP2C in regulating neuronal circuit function and behavior	93.853	5K99NS109323-02		0	80,760
Do seizures stimulate glioma progression?	93.853	5R03NS103125-02		0	80,397
Genetic Determinants of Epilepsy in Murine Systems	93.853	5R37NS031348-28		0	80,044
Development and function of an adult locomotion circuit in Drosophila	93.853	5R01NS070644-10		0	76,451
Neural populations, high frequency oscillations and EEG seizures	93.853	5R01NS095368-03		24,346	75,235
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	67,553
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		0	66,974
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		52,656	65,233
Cellular and Molecular basis for cognitive impairment associated with Glucocerebrosidase (GBA1) mutation	93.853	5R01NS104390-02		0	63,399
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		46,944	62,444
Multimodal Imaging Biomarkers of Parkinson s Disease	93.853	1R56NS099239-01A1		0	62,385
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		46,616	62,116
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	57,878

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Genetic Determinants of Epilepsy in Murine Systems	93.853	5R37NS031348-26		0	56,977
Health Disparities in Sepsis as a Risk Factor for Stroke	93.853	5R03NS101417-02		0	56,512
New York Stroke Trials network of Columbia and Cornell (NYCCSTN)	93.853	5U10NS086728-05		27,641	53,749
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		49,378	51,897
The role of the superficial cortical layers in whisker-based shape discrimination	93.853	5F32NS096819-03		0	51,594
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	51,211
How do discriminative touch receptors selectively innervate peripheral targets?	93.853	5F31NS094023-04		0	49,524
Pharmacologic Treatment of Human Mitochondrial DNA (mtDNA) Disease	93.853	5F30NS093798-04		0	49,524
Summer Program for Under Represented Students (SPURS)	93.853	5R25NS076445-08		0	49,187
Generation of caspase-9 cell specific inducible knockout mice for the study of mechanisms of cerebral edema	93.853	5R03NS099920-02		0	47,956
Excitatory spinal micro-circuit mechanisms involved in locomotor activity	93.853	5F30NS098551-04		0	44,524
Cellular and molecular mechanisms of neuronal remodeling in healthytissue	93.853	5F31NS103439-03		0	44,524
Transforming Growth Factor Beta Signaling in a mouse model of Amyotrophic Lateral Sclerosis	93.853	5F31NS108632-02		0	44,524
Optimal force production via flexible neural control of motor units	93.853	5F31NS110201-02		0	44,524
Characterizing Direct Cortical Influences on Hippocampal CA1 Population Dynamics in BehavingMice	93.853	5F31NS110316-02		0	44,524
Retromer dysfunction in amyotrophic lateral sclerosis	93.853	5F31NS101966-03		0	44,524
The role of the superficial cortical layers in whisker-based shape discrimination	93.853	5F32NS096819-03		0	43,450
Defining the transcriptional regulation of motor neuron maturation in vivo and in vitro	93.853	5F32NS105372-02		0	43,444
Lysosomal stress triggers exosome release and transfer of proteins	93.853	5R21NS093569-02		7,750	42,858
Effects of learning on multi-sensory integration in primary sensory cortical areas	93.853	5F31NS105490-02		0	42,497

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Do Unique Homeobox Gene Codes Define all Neuron Classes of the C. Elegans Nervous System	93.853	5F31NS105398-02		0	42,491
Regulation of L-DOPA induced dyskinesia by the substantia nigra pars reticulata	93.853	1R21NS108068-01		0	37,531
Control of sexually dimorphic synaptic wiring	93.853	5F31NS096863-03		0	34,784
Generation of mice to selectively mark a subset of spinal interneurons	93.853	5R03NS103148-02		0	33,491
Modulating selective autophagy to modify Huntington's disease	93.853	2R01NS077111-05A1		0	31,641
Summer Program for Under Represented Students (SPURS)	93.853	5R25NS076445-08		0	31,439
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		0	31,428
Single cell analysis of the infiltrative margins of glioblastoma and post-treatment recurrence	93.853	5R01NS103473-03		0	30,944
Computational and circuit mechanisms of decision making	93.853	1R01NS113113-01		0	30,046
Advanced Graduate Training Program in Theoretical Neuroscience	93.853	5T32NS064929-10		0	29,786
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		8,410	29,607
Role of ER-mitochondria contacts in dendritic Ca2+ homeostasis, synaptic integration and circuit function	93.853	1R01NS107483-01A1		0	28,679
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		20,191	28,330
mRNA Translation Dysregulation in Neurodevelopmental and Neurodegenerative Diseases (Stephanie Herrlinger)	93.853	8K00MH121382-03		0	26,813
Peripheral mechanisms of neurotransmission in mammalian touch receptors	93.853	5F31NS105449-02		0	25,610
Cellular and Molecular basis for cognitive impairment associated with Glucocerebrosidase (GBA1) mutation	93.853	5R01NS104390-02		0	24,464
3 of 7 Epi4K: Sequencing, Biostatistics & Bioinformatics Core	93.853	5U01NS077303-06		0	23,050
Dendritic Patterning by interacting	93.853	5R01NS061908-10		0	22,138
Do seizures stimulate glioma progression?	93.853	5R03NS103125-02		0	21,811
RNA regulatory networks in motor neuron development and function	93.853	5R01NS089676-05		0	19,972

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Understanding V1 circuit dynamics and computations	93.853	5U19NS107613-02		0	17,712
Peripheral mechanisms of neurotransmission in mammalian touch receptors	93.853	5F31NS105449-02		0	16,941
3 of 7 Epi4K: Sequencing, Biostatistics & Bioinformatics Core	93.853	5U01NS077303-06		0	15,700
Columbia University Medical Center-Weill Cornell Medical Center NEXT Site	93.853	5U10NS077267-07		15,355	15,355
Structure and Finction of AMPA subtype ionotropic glutamate receptors	93.853	5R01NS083660-05		0	14,916
Neurovascular Unit Dysfunction in Women with Severe Preeclampsia	93.853	1K23NS107645-01A1		0	14,912
Autoimmune features of neurodegenerative disorders	93.853	5R01NS095435-02		0	13,991
Mechanisms and Treatment of CNS Edema	93.853	5R01NS081333-05		0	13,953
Defining the transcriptional regulation of motor neuron maturation in vivo and in vitro	93.853	5F32NS105372-02		0	12,512
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	12,115
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		0	11,791
Identifying Huntingtons Disease Markers by Modern Statistical Learning Methods	93.853	5U01NS082062-03		0	11,744
Striatal Specific Alterations in Translation, Synaptic Function, and Behavior in Autism Spectrum	93.853	5R00NS087112-04		0	11,633
Systematic functional dissection of neuronal transcriptome diversity	93.853	5R21NS098172-02		0	10,987
Cellular and molecular mechanisms underlying the function of SRGAP2 during synaptic development	93.853	5R01NS067557-10		0	10,850
Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial - Hemodynamics (CREST-H)	93.853	5R01NS097876-03		0	9,840
Promoting Research in PLS: Current Knowledge and Future Challenges	93.853	1R13NS111790-01		0	9,191
: Focused ultrasound and synucleinopathy	93.853	1R21NS111176-01		0	8,768
Dynamic Neural Mechanisms of Audiovisual Speech Perception	93.853	5U01NS098976-03		0	7,844
Cadherin-Catenin Based Recognition in Sensory-Motor Connectivity	93.853	5R01NS080932-05		0	7,546

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial - Hemodynamics (CREST-H)	93.853	5R01NS097876-03		7,353	7,353
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	6,605
NAMDC: Overall Research Plan	93.853	5U54NS078059-08		3,979	6,499
Development of ferroptosis inhibitors for Huntington Disease	93.853	1R61NS109407-01A1		0	5,283
Neuroepidemiology Training Program	93.853	5T32NS007153-35		0	3,604
Computational and circuit mechanisms underlying motor control	93.853	5U19NS104649-03		0	2,841
Effects of learning on multi-sensory integration in primary sensory cortical areas	93.853	5F31NS105490-02		0	1,987
Planning grant: Columbia-Yale-Bilkent Study: Genetic Study of Essential Tremor	93.853	5R21NS098930-02		0	680
Cellular and molecular mechanisms underlying the function of SRGAP2 during synaptic development	93.853	5R01NS067557-10		0	509
NEUROTROPHIC FACTOR DEPRIVATION AND NEURONAL CELL DEATH	93.853	5R01NS033689-23		0	347
The role of glucocerebrosidase and chaperone-mediated autophagy in Parkinson's disease	93.853	5K08NS083738-05		0	203
Blood Flow and Cognition in Asymptomatic Carotid Artery Disease	93.853	4R01NS076277-05		0	3
Novel genetic determinants of the neuromuscular SMA phenotype	93.853	4R01NS057482-09		0	-1
A kinase pathway required for terminal axon branching and presynaptic function	93.853	5R01NS089456-09		0	-1
Role of phosphoinositides in neuronal membrane traffic and neurodegeneration	93.853	4R01NS056049-10		0	-2
New York Columbia Collaborative SPOTRIAS	93.853	5P50NS049060-09		0	-3
Identifying Huntingtons Disease Markers by Modern Statistical Learning Methods	93.853	5U01NS082062-03		0	-42
The role of a Synuclein transcript variants in neuronal pathology and function	93.853	5R01NS082068-05		0	-276
Neurology Research Education and Mentorship Program	93.853	5R25NS070697-10		0	-625
Peripheral Mechanisms Governing Tactile Encoding During Normal Target Remodeling	93.853	4R01NS073119-07		0	-3,196

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Genetic Determinants of Epilepsy in Murine Systems	93.853	5R37NS031348-26		0	-3,762
The behavioral functions of upper and lower cortical layers	93.853	5R01NS094659-03		0	-6,303
Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial - Hemodynamics (CREST-H)	93.853	5R01NS097876-03		0	-7,206
Functional dissection of a radial subdivision among hippocampal pyramidal cells	93.853	5F30NS090819-04		0	-7,605
The role of the superficial cortical layers in whisker-based shape discrimination	93.853	5F32NS096819-03		0	-43,634
				\$8,288,049	\$43,066,596
Allergy and Infectious Diseases Research					
Center for Solutions for ME/CFS	93.855	5U54AI138370-03		205,124	2,057,459
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		1,627,931	1,925,298
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		1,650,294	1,650,294
Á Tolerance Approach to Xenotransplantation	93.855	5P01AI045897-19		18,356	1,601,958
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		1,231,815	1,268,137
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	1,103,259
A Household Yeast Biosensor for cholera	93.855	5R01Al110794-05		95,062	984,625
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		685,495	841,146
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		0	772,700
Human anti-viral immune responses in tissues and circulation	93.855	5U19Al128949-02		718,252	756,431
Intestinal allograft tolerance in large animals	93.855	5R01Al138547-02		0	703,176
Modeling the development, age structure and maintenance of T cell populations	93.855	5R01Al093870-11		273,937	697,709
Center for Solutions for ME/CFS	93.855	5U54Al138370-03		277,789	671,050

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		210,874	663,037
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	629,871
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		31,113	617,033
Micron-scale Spatial Metagenomic Mapping of Microbial Biogeography in the Gastrointestinal Tract	93.855	5R01Al132403-03		0	609,989
Engineering protease-resistant alpha-beta peptides	93.855	5R01Al114736-05		338,269	599,905
Development of novel endosome-targeted Ebola virus entry inhibitors as antiviral agents	93.855	5R01Al121349-04		302,087	584,734
Innate B cell immunity and antibody-mediated rejection of human kidney allografts	93.855	5R01Al123342-04		7,058	566,887
Elucidating the molecular basis of piperaquine resistance and the role of altered hemoglobin metabolism in Plasmodium falciparum	93.855	5R01Al124678-03		47,202	559,970
Flu SAFE: Flu SMS Alerts to Freeze Exposure	93.855	5R01Al127812-03		0	557,977
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	545,336
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	542,518
Altered CD4+ T cell function in relation to the AHI1 MS locus	93.855	5R01Al130547-04		0	540,198
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		82,462	537,614
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	536,418
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		152,824	533,434
Integration of Redox-Balancing Mechanisms in Pseudomonas Aeruginosa Biofilms	93.855	5R01Al103369-07		0	526,887
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		524,170	524,170
Self-assembling nanoparticles for intranasal delivery of influenza fusion inhibitors	93.855	5R01Al119762-04		235,973	498,761
Defining the Role of PfCRT and PfMDR1 as Pleiotropic Mediators of Plasmodium falciparum Multidrug Resistance	93.855	5R37AI050234-17		0	471,048
Development of lung T cell responses in infant respiratory immunity	93.855	5U01Al100119-08		0	460,481

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Promoting Engagement in the Drug Resistant TB/HIV Care Continuation in South Africa	93.855	5R01AI124413-04		334,807	451,739
Development and significance of the plasma cell niche in the humaninfant thymus	93.855	5U01AI131339-03		27,000	451,253
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	449,475
Role of ncRNA Surveillance Complex	93.855	5R01AI099195-07		0	402,088
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19AI109761-05		0	401,975
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	401,258
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1AI069470-13		0	399,092
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		40,421	397,494
Tissue compartmentalization of human lymphocytes	93.855	5P01AI106697-07		0	394,848
Long noncoding RNA expressing genomic element that control antibody diversification and chromosomal integrity in B cells	93.855	5 R01 Al134988-02		0	379,884
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	376,972
Understanding the importance of IkB-b as a selective co-activator of NF-kB signaling	93.855	5R01Al139217-02		0	375,217
Comprehensive genetic analysis of antibiotic persistence	93.855	5R01Al077562-10		0	359,504
Contribution of B cells to human cardiac allograft vasculopathy	93.855	5R01Al116814-05		22,317	340,224
Human anti-viral immune responses in tissues and circulation	93.855	5U19Al128949-02		300,674	338,298
Carbapenem-resistant bacterial colonization and infection in liver transplant	93.855	5R01Al116939-05		21,371	307,547
Role of ncRNA Surveillance Complex	93.855	5R01AI099195-07		0	296,635
Tissue compartmentalization of human lymphocytes	93.855	5P01AI106697-07		0	288,852
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	282,471
Defining P. Falciparum resistance to artemisinin-based combination therapies	93.855	5R01AI109023-05		0	281,860

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1AI069470-13		252,183	277,585
Diversifying and Regenerating T Cell Function	93.855	5R01Al113365-05		0	276,991
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	273,687
Center for Solutions for ME/CFS	93.855	5U54AI138370-03		0	268,832
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		268,580	268,580
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	261,435
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		207,134	254,799
New mechanism of commensal bacteria interaction with host immunity	93.855	5R21Al126305-02		0	254,188
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	253,693
Asymmetric Lymphocyte Division in the Immune Response	93.855	5R01Al076458-10		0	249,249
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		0	248,650
Human anti-viral immune responses in tissues and circulation	93.855	5U19Al128949-02		0	237,666
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	235,975
Global HIV Implementation Science Research Training Grant	93.855	5T32Al114398-05		0	222,585
Novel mechanisms regulating PD-1 signaling and function	93.855	5R01Al125640-05		0	219,407
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		219,003	219,003
Mechanism of Zika virus induced corticogenesis defects	93.855	5R21Al139775-02		0	216,742
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		55,232	212,503
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	212,039
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	205,551

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Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19AI131474-02		0	(Includes Subrecipients) 201,127
In vivo development and reactivity of human autoreactive T cells	93.855	5R01Al142428-02		0	190,354
DEFINING THE ROLE OF CELL MIGRATION IN HUMAN NK CELL DIFFERENTIATION	93.855	5R01Al137073-02		0	186,948
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		179,828	179,828
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	173,565
Structural basis of antibody affinity maturation by somatic hypermutation	93.855	5R21Al138024-02		0	171,752
A Rationally Targeted Approach to Preventing GBS Infection	93.855	5K08Al132555-02		4,212	162,500
Sample Sparing Chambers for Imaging of T cell Response and Function	93.855	5U24AI118669-04		0	161,508
Human anti-viral immune responses in tissues and circulation	93.855	5U19AI128949-02		0	161,274
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	159,665
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	159,158
Training in Pediatric Infectious Diseases	93.855	5T32Al007531-20		0	154,210
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		43,190	153,581
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19AI109761-05		0	152,435
Columbia University Graduate Training Program in Microbiology and Immunology	93.855	5T32Al106711-05		0	148,994
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		52,981	146,869
DÉTÉRMINING THE ROLE OF THE REPLICATIVE HELICASE IN HUMAN NK CELL DEVELOPMENT	93.855	1R01Al137275-01A1		0	146,109
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19AI109761-05		0	137,837
Tissue compartmentalization of human lymphocytes	93.855	5P01AI106697-07		0	136,709
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	136,135

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	133,692
Columbia Integrated Training Program in Infectious Diseases Research	93.855	5T32Al100852-07		0	133,246
Human anti-viral immune responses in tissues and circulation	93.855	5U19AI128949-02		0	128,566
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	121,493
Human anti-viral immune responses in tissues and circulation	93.855	5U19AI128949-02		0	121,047
Advanced Rigidity-based Material for Enhanced Immunotherapy	93.855	5R01Al110593-04		0	119,489
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19AI067773-15		0	116,880
Human anti-viral immune responses in tissues and circulation	93.855	5U19Al128949-02		0	115,806
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-05		115,793	115,793
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	110,502
Human anti-viral immune responses in tissues and circulation	93.855	5U19Al128949-02		0	106,884
Physiological responses to cell wall-active antibiotics in a Gram-positive bacterium	93.855	5R21Al135427-02		0	105,610
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	104,426
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	104,310
Development and significance of the plasma cell niche in the humaninfant thymus	93.855	5U01Al131339-03		15,070	103,293
PRovide Options for Treatment of Exposed Children against Tuberculosis (PROTECT) Study	93.855	5R21Al138807-02		20,392	97,359
Elucidating transmission of plasmids harboring blaKPC among carbapenemresistant Enterobacteriaceae using long-range sequencing	93.855	1K23Al137316-01A1		0	94,885
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	94,805
The generation, migration and function of inflammatory ILC2s	93.855	4R00Al123350-02		0	94,227
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	92,332

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	OFDA	Don't of No	Dana thannah Cantanat Numban	0.1	R&D Cluster
<del></del>	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	89,598
Development of Localized T Cell Immunity in Pediatric Respiratory Tract Infection	93.855	1K23Al141686-01		0	89,334
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	87,573
Preventing Childhood Tuberculosis in Lesotho (PREVENT Study)	93.855	5K01Al104351-05		0	84,932
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	81,710
Mechanisms mediating tissue repair by leukocytes during influenza virus infection	93.855	5K22Al127847-02		0	80,793
PRovide Options for Treatment of Exposed Children against Tuberculosis (PROTECT) Study	93.855	5R21Al138807-02		0	72,229
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		0	70,891
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	70,628
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19AI131474-02		0	70,421
Human anti-viral immune responses in tissues and circulation	93.855	5U19AI128949-02		0	66,283
Inferring Shifts in Susceptibility and Cross Protection to Influenza from (Sub)typed Incidence Data	93.855	5R03Al135926-02		0	64,100
Non-redundant functions of type 3 innate lymphoid cells in mucosal immunity	93.855	1R01Al144808-01		0	58,851
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		54,252	57,808
Controllable Rigidity Surface for T Cell Mechanobiology	93.855	5R21Al1119953-02		9,512	56,494
Intestinal Immune Response in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome	93.855	5R21Al121996-02		0	56,084
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		26,078	52,436
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		51,180	51,180
Epigenetic Regulation of Dendritic Cell Development	93.855	5F31Al124661-03		0	44,524
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	44,333

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Human anti-viral immune responses in tissues and circulation	93.855	5U19AI128949-02		0	43,552
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	42,630
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	40,683
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19AI067773-15		31,936	37,355
Tissue compartmentalization of human lymphocytes	93.855	5P01AI106697-07		0	34,333
Training in Pediatric Infectious Diseases	93.855	5T32Al007531-20		0	33,490
Title: Recipient Epidemiology and Donor Evaluation Study IV - Pediatric (REDS-IV-P) Domestic Hub	93.855	75N92019D00037		0	31,993
Role of ncRNA Surveillance Complex	93.855	5R01Al099195-07		0	28,565
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		27,840	27,840
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		0	24,727
The 10th International Workshop on HIV Pediatrics	93.855	1R13Al139274-01		15,489	24,201
Global HIV Implementation Science Research Training Grant	93.855	5T32Al114398-05		0	23,917
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	23,243
Molecular basis for paramyxovirus entry	93.855	7R01Al031971-24		-1,060	21,921
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	20,420
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	20,080
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	19,743
Human anti-viral immune responses in tissues and circulation	93.855	5U19Al128949-02		0	19,165
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	17,253
Human anti-viral immune responses in tissues and circulation	93.855	5U19Al128949-02		0	16,577

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19AI067773-15		0	14,822
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	11,585
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19AI109761-05		0	11,552
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	10,369
A Tolerance Approach to Xenotransplantation	93.855	5P01Al045897-19		0	10,292
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19AI067773-15		0	9,722
Tissue compartmentalization of human lymphocytes	93.855	5P01AI106697-07		0	8,835
Understanding the Role of NF-kB T-regulatory Cell Function	93.855	5R01Al068977-11		0	8,374
Integration of Redox-Balancing Mechanisms in Pseudomonas Aeruginosa Biofilms	93.855	5R01Al103369-07		0	7,888
A Tolerance Approach to Xenotransplantation	93.855	5P01AI045897-19		0	7,785
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-05		0	6,874
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		0	6,869
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	6,614
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	6,531
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-07		0	6,442
Sample Sparing Chambers for Imaging of T cell Response and Function	93.855	5U24AI118669-04		0	6,220
Development of lung T cell responses in infant respiratory immunity	93.855	5U01AI100119-08		0	3,631
Engineering and targeting novel antigen-specific tolerogenic interfaces	93.855	5R21Al110812-02		0	2,889
Preventing Childhood Tuberculosis in Lesotho (PREVENT Study)	93.855	5K01AI104351-05		0	1,976
Elucidating the complex genetic and molecular basis of Plasmodium falciparum artemisinin resistance.	93.855	5F32AI120578-03		0	1,589

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19Al067773-15		0	847
Contribution of B cells to human cardiac allograft vasculopathy	93.855	5R01AI116814-05		0	411
Biomarker for XDR-TB Treatment Response and Drug Resistance in HIV Endemic Area	93.855	5K23Al098479-05		0	370
Columbia Integrated Training Program in Infectious Diseases Research	93.855	5T32AI100852-07		0	10
Center for High-Throughput Minimally-Invasive Radiation Biodosimetry	93.855	5U19AI067773-15		0	9
Columbia Partnership for Prevention and Control of HIV/AIDS Clinical Trials Unit (Columbia Partnership CTU)	93.855	5UM1Al069470-13		0	-132
Microbial Discovery and Immunity in ME/CFS	93.855	1R56Al120724-01		0	-2,062
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		-2,654	-2,654
Tissue compartmentalization of human lymphocytes	93.855	5P01Al106697-05		0	-3,301
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	-3,352
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	-6,342
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	-7,425
A Combination Intervention Package for Isoniazid Preventive Therapy in Ethiopia (NY)	93.855	5R01Al100044-03		0	-7,772
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	-10,312
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	-14,001
Integration of redox-balancing mechanisms in Pseudomonas aeruginosa biofilms	93.855	5R01Al103369-05		0	-14,490
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19Al109761-05		0	-15,468
Regulatory T cells to promote mixed chimerism for tolerance to islets andkidneys from deceased and living donors	93.855	5U19Al131474-02		0	-35,116
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19AI109761-05		0	-45,410
Tissue compartmentalization of human lymphocytes	93.855	5P01AI106697-05		0	-54,190

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
	<u>01 57 1</u>	<u>1 10 000110</u>	r ass amough contrast Nambor	<u>Oubreoipients</u>	(Includes Subrecipients)
Center for Research in Diagnostics and Discovery - Administrative Core	93.855	5U19AI109761-05		0	-128,660
				\$11,108,848	\$45,524,268
Biomedical Research and Research Training					
Medical Scientist Training Program	93.859	5T32GM007367-44		0	1,303,24
Mechanisms of Epigenetic inheritance	93.859	5R35GM118015-04		0	862,052
Molecular Mechanisms Underlying DNA Double-Strand Break and Crosslink Repair	93.859	5R35GM118180-04		0	827,51:
Morphogen control of organ growth in Drosophila	93.859	5R35GM127141-02		0	781,889
Genetic analysis of nematode cell differentiation	93.859	5R35GM122522-03		0	728,80
Interpreting and Deploying Genomic Information During Animal Development	93.859	5R35GM118336-04		0	716,30
Structural and functional studies of mRNA processing, stability and quality control	93.859	5R35GM118093-04		50,683	693,46
Understanding Complex Gene Editing Systems and RNA Biology in Oxytricha	93.859	5R35GM122555-03		0	682,37
Microtuble networks and Virus Trafficking	93.859	5P01GM105536-05		491,103	645,29
Extended Methods and Software Development for Health NLP	93.859	5R01GM114355-03		446,612	617,14
Identifying Remote Regulators of Complex I Biogenesis in Drosophila	93.859	5R35GM124717-03		0	583,030
Structure and Function of Desmosomal Cadherins	93.859	5R01GM118584-03		198,333	580,350
Structural Analysis of Macromolecular Assemblies	93.859	5R01GM029169-37		0	578,98
Mechanism and regulation of DNA double-strand break repair	93.859	5R35GM126997-02		0	570,55
Lipid biosynthesis and modification by integral-membrane enzymes	93.859	5R01GM111980-04		60,183	569,95
Training in Cellular, Molecular and Biomedical Studies	93.859	5T32GM008224-33		0	565,55
Somatic Stem Cells in the Drosphila Ovary	93.859	5R01GM079351-10		0	530,18

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Mitochondrial stress signal transduction from organelle to organism	93.859	5R35GM119793-04		0	524,656
Mitochondrial inheritance and quality control	93.859	5R35GM122589-03		0	504,273
Uncovering the Structure of Evolution using the Topology of Genomic Data with Applications to HIV	93.859	5R01GM117591-04		27,967	495,981
IMSD at Columbia s Mailman School of Public Health	93.859	5R25GM062454-16		0	494,263
Cell polarity and cytokinesis	93.859	5R01GM117407-04		0	485,422
Circadian regulation of physiological functions	93.859	5R35GM127049-02		0	466,822
Spatial, temporal and environmental regulation of early gonadogenesis in C. elegans	93.859	5R01GM115718-04		0	459,966
Regulation of mRNA processing: Mechanisms and Consequences	93.859	5R35GM118136-04		0	458,267
Cellular and molecular foundations of biomedical science	93.859	5T32GM008798-18		0	453,510
Elucidation of regulation and function of amyloid-like assemblies	93.859	5R35GM124633-03		0	440,121
PURINERGIC SIGNALING IN TRAUMA AND SEPSIS	93.859	5R01GM066189-16		0	418,754
Development and Dissemination of Operational Real-Time Respiratory Virus Forecast	93.859	5U01GM110748-05		0	412,545
Computational Annotation of Orphan Metabolic Activities	93.859	5R01GM079759-07		60,000	408,576
Atomic Level Analysis of Biomolecular Structure	93.859	5R01GM107462-06		92,435	401,932
Mechanisms of Genome Integrity	93.859	5R35GM118026-04		0	398,634
Drug Effect Discovery Through Data Mining and Integrative Chemical Biology	93.859	5R01GM107145-05		0	388,793
Role of Nucleo-cytoskeleton Interactions in Cell Migration	93.859	5R01GM099481-08		0	377,400
Computer Studies of Protein Structure and Function	93.859	5R01GM030518-38		0	368,875
Single-nucleotide resolution mapping of allelic protein-RNA interactions and splicing regulatory variants	93.859	5R01GM124486-02		0	368,235
Integrate cancer genomics data in genetic studies and diagnosis of developmental disorders	93.859	5R01GM120609-03		25,047	367,174

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Modeling SNARE-Mediated Membrane Fusion	93.859	5R01GM117046-03		0	364,706
Natural Selection in Recent Human Evolution	93.859	5R01GM121372-03		0	357,606
The Impact Of Surgery-Induced Neuroinflammation On Tau Pathology And Function	93.859	5R01GM101698-08		8,916	353,067
Mechanism of activation and modulation in human GABA(B) receptor	93.859	5R01GM125801-02		22,688	338,322
Molecular mechanism of nucleobase/vitamin C transporters	93.859	5R01GM119396-04		140,244	336,937
Continued Development and Maintenance of the 3DNA Suite of Programs	93.859	5R01GM096889-09		106,924	336,088
Mutation rate variations in primates	93.859	5R01GM122975-03		0	331,960
Predoctoral Training Grant in Genetics and Development	93.859	5T32GM007088-45		0	329,909
Mechanism of Heterochromatin Assembly and Oncogenic Histone Mutations	93.859	5R35GM126910-02		0	322,874
The structural dynamics of translation elongation and its regulation	93.859	5R01GM119386-04		15,434	321,637
Modeling Contractile Ring Constriction in Fission Yeast	93.859	5R01GM086731-09		0	316,489
Nanomechanics of bacterial adhesion	93.859	5R01GM116122-18		0	313,108
Regulation of Protein Production Dynamics: RNA Binding Proteins and the Ribosome Code	93.859	5R35GM128802-02		0	310,659
Long-Lasting Effects of Anesthetics on Synapse Development and Plasticity	93.859	7R01GM107469-06		0	301,038
Transcriptional regulation by the DNA damage response	93.859	5R01GM117064-04		0	292,554
Protein Motions in Recognition, Regulation and catalysis	93.859	5R01GM059273-19		0	286,205
NMR Studies of Structure and Dynamic of Proteins	93.859	5R01GM050291-23		0	283,764
Biophysical mechanisms of ABC-F proteins	93.859	5R01GM120579-04		0	272,076
Experimentally Guided Ribosomal RNA Modeling	93.859	5R01GM055440-21		0	270,462
Anesthesiology Research Training	93.859	5T32GM008464-27		0	266,648

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Microtuble networks and Virus Trafficking	93.859	5P01GM105536-05		0	261,851
The structural dynamics of translation initiation	93.859	5R01GM084288-09		0	256,553
Studies of Riboswitch-Mediated Transcriptional Control Using Single-Molecule Field-Effect Transistors	93.859	5R01GM107417-04		0	254,937
Asymmetric Synthesis of Nitrogen Heterocycles	93.859	5R01GM080442-12		0	253,633
Microtuble networks and Virus Trafficking	93.859	5P01GM105536-05		0	253,014
Catalysis of Tin-Free Radical Reactions Under H2	93.859	5R01GM124295-03		110,981	250,053
Enhancing Secondary School STEM Education for Students and Teachers through Biomedical Engineering Design	93.859	5R25GM129217-04		0	249,506
The population genetics of disease risk and other quantitative traits	93.859	5R01GM115889-05		0	249,256
Super-multiplex vibrational imaging in living cells	93.859	5R01GM128214-02		0	246,696
Mechanisms of Anesthetic Effects on Tachykinin Induced Airway Tone	93.859	5R01GM065281-16		41,556	245,700
Hedgehog signaling in Drosophila	93.859	5R01GM041815-29		0	242,896
Mechanisms of cell competition that regulate growth during development	93.859	5R01GM078464-12		0	242,649
Competition and morphogenesis in tip cell-mediated branching of tubular networks	93.859	7R01GM089782-08		0	241,872
New modes and mechanisms of negative regulation of LIN-12/Notch in C. elegans	93.859	5R01GM114140-04		0	241,412
Structural Studies of Human Extracellular Calcium-Sensing Receptor	93.859	5R01GM112973-04		0	239,450
Selective Functionalization of Aliphatic Amines and Derivatives	93.859	5R01GM125206-03		0	214,739
Quantitative studies of influenza evolution	93.859	5R01GM109018-05		0	206,203
Interpreting and Deploying Genomic Information During Animal Development	93.859	5R35GM118336-04		0	201,953
Tropomyosin and tyrosine kinases in mechanics of cancer	93.859	5R01GM113022-04		0	188,077
Post-selection inference and trajectory analysis	93.859	5R01GM095722-08		0	185,331

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Rational Engineering of Improved Protein Crystallization	93.859	5R01GM127883-02		0	158,777
Mechanisms of Genome Integrity	93.859	5R35GM118026-04		0	151,267
Regulation of Protein Synthesis in Bacteria by Ser/Thr Phosphorylation	93.859	5 R01 GM114213-04		0	150,917
Microtuble networks and Virus Trafficking	93.859	5P01GM105536-05		149,981	149,981
The structural dynamics of translation elongation and its regulation	93.859	5R01GM119386-04		0	148,296
Medical Scientist Training Program	93.859	5T32GM007367-44		0	113,400
TRPML1 channel physiology and pathophysiology	93.859	5R01GM085234-08		0	102,422
Biophysical mechanisms of ABC-F proteins	93.859	5R01GM120579-04		0	101,263
Structural and Functional Studies of Potassium Channels by Solid State NMR	93.859	5R01GM088724-08		0	90,815
Structural basis of aminoarabinose biosynthes	93.859	5K99GM123228-02		0	89,883
Structural and functional studies of mRNA processing, stability and quality control	93.859	5R35GM118093-04		0	67,503
Structural and Functional Studies of Potassium Channels by Solid State NMR	93.859	5R01GM088724-08		0	66,375
Small G-protein Regulation of Calcium Channels	93.859	5R01GM107585-04		0	61,208
Control of Drosophilia wing growth by morphogen	93.859	5R01GM113000-04		0	60,935
Regulation of Protein Production Dynamics: RNA Binding Proteins and the Ribosome Code	93.859	5R35GM128802-02		0	59,909
Identifying Remote Regulators of Complex I Biogenesis in Drosophila	93.859	5R35GM124717-03		0	52,483
Medical Scientist Training Program	93.859	5T32GM007367-44		0	51,806
Biophysical mechanisms of ABC-F proteins	93.859	5R01GM120579-04		0	51,781
Systems Level Characterization of a New Epigenetic Mechanism of Gene Expression and Cellular Adaptation	93.859	5F32GM125170-02		0	51,646
Morphogen control of organ growth in Drosophila	93.859	5R35GM127141-02		0	49,495

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Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Characterizing and Mapping Deleterious Mutations in Humans	93.859	5F32GM128318-02		0	(Includes Subrecipients) 47,203
The role of protein-protein interaction motifs in coordinating the DNA binding and regulatory specificity of Hox proteins	93.859	5F32GM125329-02		0	46,903
Coupling promoter choice and alternative RNA	93.859	5K99GM121815-02		0	43,290
A C. elegans model for studying blocks to EGFR signal transduction in quiescent cells	93.859	5F31GM126741-02		0	42,470
A Combined Rhodium-Photoredox-Catalyzed Approach to Alkene Carbofunctionalization by Carbon- Hydroge	93.859	5F32GM126609-02		0	42,357
Studies of Riboswitch-Mediated Transcriptional Control Using Single-Molecule Field-Effect Transistors	93.859	5R01GM107417-04		0	41,540
Carbon monoxide exposure and anethesia-induced neurotoxicity	93.859	5R01GM103842-06		26,817	41,530
Population Genetic Modeling of the Genetic Architecture of Complex Disease	93.859	1F32GM126787-01		0	41,129
Single-nucleotide resolution mapping of allelic protein-RNA interactions and splicing regulatory variants	93.859	5R01GM124486-02		8,028	40,771
Molecular mechanisms of cargo capture into ER-derived transport vesicles	93.859	4R01GM085089-08		40,554	40,554
Quantitative studies of influenza evolution	93.859	5R01GM109018-05		0	38,815
Structural basis of integral membrane enzyme function	93.859	1R35GM132120-01		0	38,737
Microtuble networks and Virus Trafficking	93.859	5P01GM105536-05		37,081	37,081
Control of Transcription Termination in E. Coli	93.859	5R01GM037219-29		0	36,836
Mechanism of Heterochromatin Assembly	93.859	5R01GM085145-09		0	36,212
Reversible regulation of ribosome recycling by Ser/Thr phosphorylation	93.859	5F32GM122266-02		0	30,842
The roles of anesthetics and neuroimmune interactions in postoperative cognitive dysfunction	93.859	1R35GM131765-01		0	29,520
Conformational Landscape of TIA1 in Functional Aggregates by Solid-State NMR and Cryogenic Electron Microscopy	93.859	1F32GM128290-01A1		0	29,288
Reversible regulation of ribosome recycling by Ser/Thr phosphorylation	93.859	5F32GM122266-02		0	28,810
Identifying Novel Regulators of Mitochondrial Complex I Biogenesis	93.859	5F31GM125363-02		0	26,644

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Ultrahigh-resolution and single-molecule stimulated Raman scattering (SRS) microscopy	93.859	1R01GM132860-01		0	25,221
Lipid biosynthesis and modification by integral-membrane enzymes	93.859	5R01GM111980-04		0	23,338
Mechanism of activation and modulation in human GABA(B) receptor	93.859	5R01GM125801-02		0	22,873
A Combined Rhodium-Photoredox-Catalyzed Approach to Alkene Carbofunctionalization by Carbon- Hydroge	93.859	5F32GM126609-02		0	22,576
Identifying Novel Regulators of Mitochondrial Complex I Biogenesis	93.859	5F31GM125363-02		0	22,022
Macromolecular dynamics and conformational changes in biological function	93.859	1R35GM130398-01		0	19,101
Rational Engineering of Improved Protein Crystallization	93.859	5R01GM127883-02		0	17,932
Characterizing and Mapping Deleterious Mutations in Humans	93.859	5F32GM128318-02		0	14,315
Studies of Riboswitch-Mediated Transcriptional Control Using Single-Molecule Field-Effect Transistors	93.859	5R01GM107417-04		0	13,813
Interpreting and Deploying Genomic Information During Animal Development	93.859	5R35GM118336-04		0	12,346
Mechanisms of cell competition that regulate growth during development	93.859	5R01GM078464-12		0	11,531
Protein Dynamics Under Force	93.859	1R35GM129962-01		0	8,545
Regulation of Protein Synthesis in Bacteria by Ser/Thr Phosphorylation	93.859	5 R01 GM114213-04		0	8,530
Mechanisms of Anesthetic Effects on Tachykinin Induced Airway Tone	93.859	5R01GM065281-16		0	7,446
Regulation of mRNA processing: Mechanisms and Consequences	93.859	5R35GM118136-04		0	5,218
Cellular and molecular foundations of biomedical science	93.859	5T32GM008798-18		0	4,302
A C. elegans model for studying blocks to EGFR signal transduction in quiescent cells	93.859	5F31GM126741-02		0	4,200
Asymmetric Synthesis of Marcolide Antibiotics	93.859	5R01GM058133-16		0	3,579
Training in Cellular, Molecular and Biomedical Studies	93.859	5T32GM008224-33		0	3,240
Anesthesiology Research Training	93.859	5T32GM008464-25		0	2,905

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Anesthesiology Research Training	93.859	5T32GM008464-27		0	1,109
Lipid biosynthesis and modification by integral-membrane enzymes	93.859	5R01GM111980-04		0	542
Babesiosis Emergence in the United States	93.859	5R01GM105246-05		0	216
Proximo-Distal Patterning in the Drosophila Appendages	93.859	5R01GM058575-18		0	-1
Anomalous Diffraction Analysis of Biomolecular Structure	93.859	5R01GM107462-04		0	-254
Function of the Bromodomain Protein Brdt in Spermatogenesis	93.859	4R01GM081767-08		0	-420
Anomalous Diffraction Analysis of Biomolecular Structure	93.859	5R01GM107462-04		-1,177	-1,177
Modular assembly of cytochrome oxidase	93.859	5R01GM111864-04		0	-1,746
Mechanisms of Anesthetic Effects on Tachykinin Induced Airway Tone	93.859	5R01GM065281-16		0	-2,672
Molecular mechanisms of cargo capture into ER-derived transport vesicles	93.859	4R01GM085089-08		0	-5,301
Development and Dissemination of Operational Real-Time Respiratory Virus Forecast	93.859	5U01GM110748-05		0	-19,336
Somatic stem cells in the Drosophila ovary	93.859	5R01GM079351-08		0	-103,003
				\$2,160,390	\$34,274,500
Child Health and Human Development Extramural Research					
Placenta-derived extracellular circulating RNA as a tool for monitoring placental function	93.865	5R01HD086327-04		565,763	1,068,934
Prenatal Genetic Diagnosis by Genomic Sequencing: A Prospective Evaluation	93.865	5R01HD055651-12		282,557	796,326
Structural and Social Transitions among Adolescents and young adults in Rakai (SSTAR)	93.865	5R01HD091003-03		218,188	763,948
Flu2Text: A Multi-Site Study assessing an Intervention for 2nd Dose of Influenza Vaccine	93.865	5R01HD086045-04		521,548	719,353
Bone health in perinatally HIV-infected South African children on antiretrovirals	93.865	4R01HD073977-05		4,113	699,865
Preventing Postpartum Depression: A Dyadic Approach Adjunctive to Obstetric Care	93.865	5R01HD092062-03		17,143	675,096

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Early Neonatal treatment and immune quiescence	93.865	5U01HD080441-05		450,609	651,579
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		123,802	485,156
Predictors of High-Risk Behavior among Youth (MARTINS/BLANCO/CANINO/DUARTE)	93.865	5R01HD060072-10		277,288	466,615
Columbia University/Aga Khan University Global Network Research Unit	93.865	2UG1HD078438-06		328,102	426,476
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		0	424,253
Obstetric Interventions, Neonatal Health, and Child Development	93.865	5R01HD090119-03		207,017	391,640
Infection, fever and immunity and offspring ADHD i a population based pregnancy/birth cohort	93.865	5R01HD090051-03		53,784	361,145
Regulation of neural progenitor competence	93.865	5R01HD092381-03		0	328,963
The Genetics and Neurobiology of Parental Care in Wild Mice	93.865	5R00HD084732-05		0	319,370
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		14,573	300,700
Columbia-Vietnam Social Science Training and Research Partnership: STAR II (Hirsch/Parker/Van)	93.865	5R24HD056691-10		72,343	299,824
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		22,510	288,602
Assessing a Stroke Homehealth Aide Recovery Program (SHARP) as a Potential High Impact Strategy for Improving in Functional Mobility after Stroke	93.865	5R21HD089013-02		257,147	286,014
Assisted Reproductive Technologies and Risk of Austism and Other Developmental Disabilities	93.865	5R01HD091205-02		0	263,994
Host epigenetic and mitochondrial function in HIV-infected children	93.865	4R01HD073952-05		0	259,848
A Computational Framework for the Clinical Evaluation of the Soft Tissue Mechanics in Pregnancy	93.865	5R01HD091153-03		0	256,727
Retinoid Receptor Antagonists as Novel Male Contraceptives	93.865	5U01HD060479-10		0	243,735
Columbia Population Research Center	93.865	5P2CHD058486-10		0	241,226
Effectiveness of Pictographs to Prevent Wrong-Patient Errors in the NICU	93.865	5R01HD094793-02		71,323	240,588
Systems analysis of mouse gastrulation	93.865	5R01HD085904-04		0	217,164

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Calcium activated chloride channel modulation of myometrial excitability	93.865	5R01HD082251-04		9,513	216,874
CombinADO: a combination intervention strategy to improve health outcomes for adolescents living with HIV	93.865	5UG3HD096926-02		0	209,271
Evaluating the role of human cervical smooth muscle cells in normal and premature cervical remodeling	93.865	5K08HD088758-04		0	202,738
Maternal-Fetal Medicine Units (MFMU) Network	93.865	5UG1HD040485-19		0	201,755
PŘÉNÁTAL CYTOGENÉTIC DIAGNOSIS BY ARRAY-BASED CÓPY NUMBÉR ANALYSES: Follow-up	93.865	4U01HD055651-10		73,494	174,940
GSH Training Grant	93.865	5T32HD049339-13		0	158,458
A Pilot Study to Improve Sleep Quality in Urban High School Students with Asthma	93.865	5R21HD086448-02		69,157	156,826
Columbia University/Aga Khan University Global Network Research Unit	93.865	5U10HD078438-05		143,227	154,431
Maternal Immune Activation And Fetal-Infant Neurobehavioral Development	93.865	5K23HD092589-02		0	153,470
CombinADO: a combination intervention strategy to improve health outcomes for adolescents living with HIV	93.865	5UG3HD096926-02		16,523	148,462
Identification and Characterization of the Genetic Causes of Lymphatic Anomalies	93.865	5R03HD092662-02		0	146,788
MATERNAL INFLAMMATION, DIET AND GUT MICROBIOME IN HIV: IMPACT ON INFANT OUTCOMES	93.865	4R00HD089753-03		16,115	144,146
Mentored Clinical Scientist Research Career Development Award	93.865	5K08HD082287-04		0	142,809
Evaluation of Oxidative Capacity and Exercise Tolerance in Ambulatory Patients with Spinal Muscular Atrophy	93.865	5K01HD084690-04		0	135,633
Determinants of Leukocyte Telomere Length at Birth (Susser/Factor-Litvak/Aviv)	93.865	4R01HD071180-05		0	118,930
Targeting high risk teens in the emergency department: A user informed, theory-based intervention using text messaging to reduce teen pregnancy	93.865	5K23HD096060-02		0	113,616
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		0	113,315
Decisions around chronic ventilation for children with life-limiting conditions	93.865	5K23HD082361-04		0	95,962
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		0	90,377
Fragile Families Summer Data Workshops Series 2013 to 2017	93.865	5R25HD074544-05		0	86,334

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·					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Maternal-Fetal Medicine Units (MFMU) Network	93.865	5UG1HD040485-19		0	67,700
Maternal-Fetal Medicine Units (MFMU) Network	93.865	5UG1HD040485-19		0	58,740
Early Neonatal treatment and immune quiescence	93.865	5U01HD080441-05		52,976	52,976
Systems analysis of mouse gastrulation	93.865	5R01HD085904-04		0	52,719
Archiving and Documenting the New York City Longitudinal Study of Well-Being	93.865	5R03HD095017-02		0	38,270
Aspirin before Exercise: Antipyretic pretreatment to reduce exercise-induced overheating and exhaustion in RRMS patients	93.865	1R21HD091836-01A1		0	33,545
Neonatal and Pediatric Platelet Function and Pharmacology	93.865	5R01HD081281-03		32,654	32,654
Early Menarche and the Reproductive Health of Ghanaian Girls and Young Women.	93.865	5F31HD089592-03		0	29,454
Transcriptional Regulation of Post-Embryonic Neuronal Maturation	93.865	1K99HD098371-01		0	19,112
Columbia Population Research Center	93.865	5P2CHD058486-10		0	18,509
Migration and Child Health and Development: Effects and Mechanisms	93.865	4K01HD073318-05		0	18,507
A Comprehensive Systems Analysis of Community Based Primary Health Care	93.865	5R21HD086474-02		0	16,420
Columbia Population Research Center	93.865	5P2CHD058486-10		0	15,641
Columbia Population Research Center	93.865	5P2CHD058486-10		0	10,622
Columbia Population Research Center	93.865	5P2CHD058486-10		0	10,592
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		7,615	7,615
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		0	5,283
Adolescent and Parental Attitudes About STI Prevention Trial Participation	93.865	5R01HD067287-05		0	5,048
Columbia Population Research Center	93.865	5P2CHD058486-10		0	4,800
Columbia Population Research Center	93.865	5P2CHD058486-10		0	4,800

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Columbia Population Research Center					(Includes Subrecipients)
	93.865	5P2CHD058486-10		0	4,445
Early Neonatal treatment and immune quiescence	93.865	5U01HD080441-05		0	3,411
Columbia Population Research Center	93.865	5P2CHD058486-10		0	1,980
Columbia Population Research Center	93.865	5P2CHD058486-10		0	1,720
Prevention and Planning Linkages (SANTELLI)	93.865	4R01HD072695-05		0	1,211
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		0	336
Motor Proteins in Brain Development	93.865	4R01HD040182-16		0	-1
Columbia Population Research Center	93.865	5P2CHD058486-10		0	-66
Columbia Population Research Center	93.865	5P2CHD058486-10		0	-146
Mitochondrial Encephalomyopathies: Approaches to Treatment	93.865	5P01HD080642-05		0	-1,065
Maternal-Fetal Medicine Units (MFMU) Network	93.865	5UG1HD040485-19		0	-3,274
Neonatal and Pediatric Platelet Function and Pharmacology	93.865	5R01HD081281-03		0	-5,927
Mother and Infant Retention for Health (MIR4Health) - NY	93.865	5R01HD075163-02		0	-8,918
				\$3,909,084	\$14,938,989
Aging Research					
Biomarkers of Alzheimer s Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		3,495,675	4,181,395
Pathway discovery, validation and compound identification for Alzheimer's disease	93.866	7U01AG046152-05		1,540,539	2,901,855
Interdisciplinary Research to Understand the Interplay of Diabetes, Cerebrovascular disease and Alzheimer s disease	93.866	1RF1AG051556-01		372,947	1,963,990
Offspring Study of Mechanisms of Racial Disparities in Alzheimer s Disease	93.866	1RF1AG054070-01		0	1,882,205
Exploring Cognitive Aging Using Reference Ability Neural Networks	93.866	2RF1AG038465-06		53,839	1,690,585

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For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
WHICAP -Genetic Epidemiology of Cerebrovascular Factors in Alzheimer s Disease	93.866	1RF1AG054023-01		0	1,438,681
Columbia University Science of Behavior Change Resource and Coordinating Center	93.866	5U24AG052175-05		225,263	1,376,264
Anti-viral therapy in Alzheimer s disease	93.866	5R01AG055422-03		550,174	1,310,410
Diabetes Status and Brain Amyloid in Middle Aged Hispanics	93.866	5R01AG050440-05		100,299	1,273,845
The National Institute on Aging (NIA) Late Onset of Alzheimer's Disease(LOAD) Family Based Study (FBS)	93.866	5U24AG056270-03		617,451	1,155,752
Are there ethnic differences in brain amyloid and tau in the seventh decade of life?	93.866	5R01AG055299-03		122,000	1,098,341
Tauopathy in AD and FTD - Molecular Determinants of Phenotypic Diversity	93.866	1RF1AG056151-01A1		84,200	967,437
Cognitive training and neuroplasticity in mild cognitive impairment	93.866	5R01AG052440-03		762,116	935,008
Resilience mechanisms underlying racial/ethnic disparities in Alzheimer's disease	93.866	5R01AG054520-03		233,574	919,839
School Quality and Racial Disparities in Alzheimer's Disease in Project Talent	93.866	1RF1AG056164-01		799,114	909,279
Predictors of Severity in Alzheimer s Disease	93.866	5R01AG007370-28		273,070	795,724
Testing Olfaction in Primary care to detect Alzheimer's disease and other Dementias (TOPAD)	93.866	5R01AG057898-03		131,750	751,195
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	747,695
Assessment of ultrasound-facilitated Neurotherapeutics in Alzheimer's Disease	93.866	5R01AG038961-09		0	719,588
Old SCHOOL Hip Hop: A randomized controlled trial to improve dementia knowledge	93.866	5R01AG054536-03		108,562	719,122
Statin Neuroprotection & Cognitive Dysfunction after Carotid Endarterectomy	93.866	5R01AG050819-03		85,646	647,216
Genetic Contribution to Brain Arterial Dilatation and its Role in Cognition and dementia	93.866	5R01AG057709-02		95,619	640,709
Deconstructing and modeling the single cell architecture of the Alzheimer brain	93.866	1RF1AG057473-01		325,989	597,886
Long Life Family Study: Columbia University	93.866	5U01AG023749-13		0	583,161
An Experimental Investigation into the Impact of Socioeconomic Context on Biological Markers of Aging, Health and Mortality	93.866	5R01AG054466-03		0	575,311

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Genetic Studies of Alzheimer s Disease in Caribbean Hispanics	93.866	2RF1AG015473-16A1		0	(Includes Subrecipients) 548,095
Imaging of Cognition, Learning and Memory in Aging	93.866	5R01AG026158-13		0	533,965
Regulation of retromer proteins through an Alzheimer's disease-specific transcription factor complex	93.866	1R56AG062354-01		0	508,952
Protective genetic factors of Alzheimer disease in PSEN1 Mutation Carriers in Puerto Rico	93.866	5R01AG058918-02		202,587	492,509
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	485,816
The Role of Actin in Cellular Aging	93.866	5R33AG051047-04		0	480,383
Genetics of Alzheimer's Disease in Mexico	93.866	5R56AG059756-02		387,917	467,390
Pathogenic role for formin mediated microtubule stabilization pathways in Alzheimers disease	93.866	5R01AG050658-03		0	459,680
Entorhinal-hippocampal circuit dysfunction in AD mice	93.866	5R01AG050425-05		21,610	407,626
Role of C99 in the regulation of lipid metabolism- Relevance to Alzheimer s disease	93.866	5R01AG056387-03		0	378,659
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	377,216
Mitochondrial maintenance mechanisms of stem cells and aging	93.866	5R01AG055910-03		4,315	367,836
Dietary Modulation of Neuroinflammation in Age-Related Memory Disorders	93.866	5R01AG058417-02		18,906	366,131
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	366,087
Convergence of myeloid susceptibility protein function in Alzheimer's disease	93.866	1RF1AG058852-01		8,412	356,304
Task-specific and person-specific factors related to SubjectiveCognitive Decline	93.866	5R01AG054525-03		0	347,890
Long Life Family Study: Columbia University	93.866	5U01AG023749-13		103,480	319,266
Extracellular tau oligomers and Alzheimer disease	93.866	5R01AG049402-05		0	317,176
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	314,783
Interdisciplinary Research to Understand the Interplay of Diabetes, Cerebrovascular disease and Alzheimer s disease	93.866	1RF1AG051556-01		15,965	307,487

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Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
An integrative analysis of DNA methylation, transcriptomic changes, and cognitive dysfunction in Alzheimer s disease	93.866	5K76AG054868-02		0	(Includes Subrecipients) 295,900
Identification of protective factors for cognitive resilience in adults with Down Syndrome: A multi-omic study	93.866	1R56AG061837-01		51,545	293,658
Investigating Rab35s role in modulating stress-induced Alzheimers neuropathology	93.866	1R56AG057560-01		0	263,013
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	253,976
Tau PÉT imaging in racially/ethnically diverse middle aged adults	93.866	1RF1AG058067-01A1		0	247,520
Midcareer Award for Research in Dementia Risk Factors and Prevention	93.866	5K24AG045334-03		0	246,732
On the role of microglia-derived extracellular vesicles in amyloid-beta induced changes in synaptic function and network activity.	93.866	1R56AG056108-01		130,330	245,959
Functional connectivity network in default mode regions provides the underlying infrastructure for task-based functional co-de/activation networks	93.866	5R01AG057962-02		0	243,335
Understanding cognitive mechanisms of emotion regulation in aging	93.866	5R01AG043463-05		0	235,084
Anti-viral therapy in Alzheimer s disease	93.866	5R01AG055422-03		0	225,742
Genetic Modifiers of Alzheimer Disease in PSEN1 Mutation Carriers in Puerto Rico	93.866	1R56AG051876-01A1		175,847	221,194
Mechanisms of BMP synthesis and alterations in Alzheimer's disease	93.866	5R21AG056758-02		13,529	212,574
Identifying, validating and targeting AD susceptibility networks in monocytes	93.866	7R01AG048015-05		0	210,643
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	203,219
Neuroanatomical associations with the factor structure underlying neuropsychiatric symptoms in Alzheimer s disease	93.866	5R01AG062268-02		21,772	196,670
Admixture mapping in late-onset Alzheimer s disease	93.866	5R21AG054832-02		0	196,538
Hippocampal Neurogenesis, Pattern separation & age- Related cognitive impairments	93.866	5R01AG043688-05		151,754	193,602
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	190,977
Skeletal Disease in Type 2 Diabetes: a Novel Therapeutic Approach for the Elderly	93.866	5R21AG058210-02		0	189,147
Determinants of Critical Care Intensity for Hospitalized Older Adults: the Effect of Hospital-based Palliative Care Services	93.866	5K08AG051184-05		0	184,023

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Columbia Center for Interdisciplinary Research on Alzheimer s Disease Disparities (CIRAD)	93.866	5P30AG059303-02		0	178,601
The National Institute on Aging (NIA) Late Onset of Alzheimer's Disease(LOAD) Family Based Study (FBS)	93.866	5U24AG056270-03		166,350	175,650
The role of methylation-sensitive PP2A isoforms in regulating the pathological response to tau	93.866	1RF1AG055125-01A1		0	173,312
Biomarkers of Alzheimer s Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		0	170,220
Collaboratory on Research Definitions for Cognitive Reserve and Resilience	93.866	5R24AG061421-02		39,230	168,934
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	168,802
Summer of Translational Aging Research for Undergraduates (STARU)	93.866	5R25AG059557-02		0	167,533
Olfactory Impairment in Offspring Study of Racial Disparities in Alzheimers Disease	93.866	5R01AG058767-02		0	163,783
Expanding the knowledge base for emotion regulation in aging	93.866	1R56AG057202-01		0	162,877
White Matter Hyperintensities in Aging and Dementia	93.866	2R56AG034189-06A1		0	162,265
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		52,281	159,955
Dietary Factors and Neuroimaging Markers	93.866	5R00AG042483-05		0	159,484
Early life environment and later life dementia, cognition, neuropathology, and reserve	93.866	5K01AG050723-05		0	157,194
Frailty, Palliative Care Needs, and Outcomes in Older Survivors of Critical Illness	93.866	5K23AG045560-05		0	153,558
Biomarkers of Alzheimer s Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		144,417	151,117
Epidemiology of Familial Late-Onset Alzheimer s Disease	93.866	4R01AG041797-05		-213	149,139
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	148,646
Long Life Family Study: Columbia University	93.866	5U01AG023749-13		0	146,225
Biomarkers of Alzheimer's Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		120,690	145,372
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	135,916

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Receptor-mediated clearance of synaptic tau as a novel therapy forAlzheimer s disease.	93.866	5K01AG055694-03		0	(Includes Subrecipients) 133,238
ECSIT protects against neurodegeneration and Alzheimer's disease through the regulation of mitochondrial function and oxidative stress	93.866	1R56AG058449-01A1		0	126,888
Offspring Study of Mechanisms of Racial Disparities in Alzheimer s Disease	93.866	1RF1AG054070-01		0	126,735
Multi-omic network-directed proteoform discovery, dissection and functional validation to prioritize novel AD therapeutic targets	93.866	1U01AG061356-01		0	125,306
Apathy in Alzheimer's Disease: Investigation of the Interaction between Proline and COMT for Treatment Targeting to Positively Impact Quality of Life	93.866	5R21AG058020-02		0	120,208
Midcareer Mentoring Award for Patient Oriented Research in Geriatric Cardiology	93.866	5K24AG036778-08		0	119,741
Entorhinal-hippocampal circuit dysfunction in AD mice	93.866	5R01AG050425-05		0	118,596
Imaging inflammation and tau in elders with different clinical and biomarker profiles of Alzheimer's disease	93.866	5K23AG052633-04		0	118,128
Biomarkers of Alzheimer's Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		0	115,728
Longitudinal Changes in White Matter Integrity Predicting Cognitive Changes in Reasoning and Vocabulary Abilities	93.866	5K01AG051777-04		0	113,964
Columbia University Science of Behavior Change Resource and Coordinating Center	93.866	5U24AG052175-05		98,754	113,754
Offspring Study of Mechanisms of Racial Disparities in Alzheimer s Disease	93.866	1RF1AG054070-01		0	112,981
Dietary Modulation of Neuroinflammation in Age-Related Memory Disorders	93.866	5R01AG058417-02		0	112,177
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	110,741
School Quality and Racial Disparities in Alzheimer's Disease in Project Talent	93.866	1RF1AG056164-01		90,257	109,754
Protective genetic factors of Alzheimer disease in PSEN1 Mutation Carriers in Puerto Rico	93.866	5R01AG058918-02		0	108,318
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	106,842
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	104,502
The Brief Research in Aging and Interdisciplinary Neurosciences	93.866	5T35AG044303-07		0	101,841
Interdisciplinary Research to Understand the Interplay of Diabetes, Cerebrovascular disease and Alzheimer s disease	93.866	1RF1AG051556-01		101,202	101,202

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
The vale of a navel ab mind management transporter in Alphaimers disease					(Includes Subrecipients)
The role of a novel atypical monoamine transporter in Alzheimer s disease	93.866	5K01AG047954-05		0	100,223
Biomarkers of Alzheimer s Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		95,386	95,386
Exploring the Latent Class Structure of Inhibition in Normal Aging	93.866	5K99AG055684-02		0	93,876
Resilience mechanisms underlying racial/ethnic disparities in Alzheimer's disease	93.866	5R01AG054520-03		77,798	93,298
Olfactory deficits and donepezil treatment in cognitively impaired elderly	93.866	5R01AG041795-05		0	91,998
An Experimental Investigation into the Impact of Socioeconomic Context on Biological Markers of Aging, Health and Mortality	93.866	5R01AG054466-03		71,514	82,909
Columbia Center for Interdisciplinary Research on Alzheimer's Disease Disparities (CIRAD)	93.866	5P30AG059303-02		38,750	81,979
School Quality and Racial Disparities in Alzheimer's Disease in Project Talent	93.866	1RF1AG056164-01		72,633	79,047
Endoplasmic Reticulum Mitochondrial membranes in Alzheimer s Disease	93.866	5K01AG045335-05		0	77,902
ECSIT protects against neurodegeneration and Alzheimer's disease through the regulation of mitochondrial function and oxidative stress	93.866	1R56AG058449-01A1		0	76,478
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	73,182
Columbia Center for Interdisciplinary Research on Alzheimer's Disease Disparities (CIRAD)	93.866	5P30AG059303-02		0	70,316
Analysis of Lumbar Spine Stenosis Speciments for Early Identification of TTR Cardiac Amyloidosis	93.866	5R21AG058348-02		5,483	68,534
Tau PET imaging in racially/ethnically diverse middle aged adults	93.866	1RF1AG058067-01A1		0	68,400
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	68,178
À Translational Bioinformatics Approach to Rescuing Synaptic and Neurophysiologic Dysfunction in Alzheimer s Disease	93.866	5R01AG059854-02		0	66,053
A pilot randomized trial of arteriovenous fistula versus arteriovenous graft in elderly patients with advanced kidney disease	93.866	5R03AG053294-02		0	65,870
Investigating the cause of APOE4-associated microglial activation and its resulting neurotoxicity of tauopathy-afflicted neurons	93.866	1K01AG061264-01		0	61,510
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	60,032
Genetic Studies of Alzheimer's Disease in Caribbean Hispanics	93.866	2RF1AG015473-16A1		0	59,351

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Exploring Cognitive Aging Using Reference Ability Neural Networks	93.866	2RF1AG038465-06		0	(Includes Subrecipients) 58,508
A Translational Bioinformatics Approach to Rescuing Synaptic and Neurophysiologic Dysfunction in Alzheimer s Disease	93.866	5R01AG059854-02		0	57,044
Understanding the role of Eph signaling in Alzheimer s disease	93.866	1R21AG061722-01		0	55,061
Biological aging in older HIV-infected African Americans	93.866	5R21AG056175-02		0	54,853
Aging of tissue-specific clocks in the immune system of Drosophila	93.866	5R01AG045842-05		0	53,366
Formin-mediated stabilization of dynamic microtubules in the pathogenesis of early-onset familial Alzheimers disease	93.866	5R03AG060025-02		0	49,740
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	48,000
WHICAP -Genetic Epidemiology of Cerebrovascular Factors in Alzheimer s Disease	93.866	1RF1AG054023-01		0	47,494
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	46,106
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	45,397
Toward Understanding Aging Mechanisms of Neuromusc	93.866	5R21AG052011-02		0	44,689
A longitudinal study of mid- to late life blood pressure profile as risk factor in Alzheimer's disease for Hispanics.	93.866	5R03AG054186-02		32,494	44,329
The role of inflammation in the association between diet and Alzheimer's disease	93.866	1R01AG059013-01A1		0	43,253
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		42,860	42,860
Biological aging in older HIV-infected African Americans	93.866	5R21AG056175-02		0	40,403
Columbia University Science of Behavior Change Resource and Coordinating Center	93.866	5U24AG052175-05		14,124	39,668
Long Life Family Study: Columbia University	93.866	5U01AG023749-13		0	39,528
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	38,055
Inferential methods for functional data from wearable devices	93.866	1R01AG062401-01A1		0	37,407
Efficient Statistical Methods for Association Studies with Dense Genotypes and Family History of Disease	93.866	5F31AG054095-02		0	33,058

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	32,725
Genetic Studies of Alzheimer's Disease in Caribbean Hispanics	93.866	2RF1AG015473-16A1		0	32,688
Factors Influencing Financial Capacity and Awareness of Capacity in Cognitive Aging	93.866	5F32AG053035-03		0	32,079
The National Institute on Aging (NIA) Late Onset of Alzheimer's Disease(LOAD) Family Based Study (FBS)	93.866	5U24AG056270-03		0	31,799
Expanding the knowledge base for emotion regulation in aging	93.866	1R56AG057202-01		0	28,283
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	28,215
Mitochondria-cytoskeleton communication and function in aging	93.866	5F31AG055326-03		0	26,644
Modernizing the Assessment of Financial Decision Making: Development and Evaluation of a Simulated Online Money Management Task in Older Adults	93.866	1K99AG062783-01		0	26,339
Factors Influencing Financial Capacity and Awareness of Capacity in Cognitive Aging	93.866	5F32AG053035-03		0	25,563
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	22,654
The Brief Research in Aging and Interdisciplinary Neurosciences	93.866	5T35AG044303-07		0	22,542
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	20,914
The Dialogue Between Bone and the Brain: Endocrine and Molecular Bases	93.866	5P01AG032959-10		0	20,680
Biomarkers of Alzheimer s Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		4,973	20,217
Columbia Center for Interdisciplinary Research on Alzheimer's Disease Disparities (CIRAD)	93.866	5P30AG059303-02		0	18,734
Mitochondria-cytoskeleton communication and function in aging	93.866	5F31AG055326-03		0	18,048
Aging of tissue-specific clocks in the immune system of Drosophila	93.866	5R01AG045842-05		0	17,183
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	15,801
Columbia Center for Interdisciplinary Research on Alzheimer s Disease Disparities (CIRAD)	93.866	5P30AG059303-02		0	14,999
Analyzing age-related changes of brain activation in subjects native space	93.866	5K01AG044467-05		0	13,224

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
The National Institute on Aging (NIA) Late Onset of Alzheimer s Disease(LOAD) Family Based Study (FBS)	93.866	5U24AG056270-03		0	10,679
Pink1, amyloid pathology, and mitchondrial quality control in Alzheimer s Disease	93.866	7RF1AG054320-02		0	10,034
TOMM40-mediated mitochondrial dysfunction and Alzheimers disease	93.866	7R01AG053041-03		0	9,952
Understanding the role of Eph signaling in Alzheimer's disease	93.866	1R21AG061722-01		0	9,384
Genetic Studies of Alzheimer s Disease in Caribbean Hispanics	93.866	2RF1AG015473-16A1		0	9,207
Investigating the vulnerability of WFS1-expressing excitatory neurons to tau pathology in early Alzheimer s disease.	93.866	5K01AG056673-02		0	9,037
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	8,661
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	8,367
Role of Cyclophilin D in Abeta-induced synaptic injury	93.866	7R37AG037319-10		0	8,210
Utilizing Single-nucleus RNA-sequencing to Investigate the Cell-Type Specific Effects of APOE4 Expression in an AD-vulnerable Brain Region	93.866	1R03AG063278-01		0	6,944
Long Life Family Study: Columbia University	93.866	5U01AG023749-13		0	5,190
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	5,101
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	5,077
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	4,294
Understanding the role of Eph signaling in Alzheimer s disease	93.866	1R21AG061722-01		0	3,764
A pilot study to advance translation of molecular signatures in biological aging	93.866	7R21AG054846-03		0	3,019
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	2,766
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	2,228
Deconstructing and modeling the single cell architecture of the Alzheimer brain	93.866	1RF1AG057473-01		0	1,933
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	1,170

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	(Includes Subrecipients) 960
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	828
Biomarkers of Alzheimer's Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		0	582
Columbia University Science of Behavior Change Resource and Coordinating Center	93.866	5U24AG052175-05		0	192
Assessment of ultrasound-facilitated Neurotherapeutics in Alzheimer's Disease	93.866	5R01AG038961-09		0	128
The Role of Actin in Cellular Aging	93.866	5R21AG051047-02		0	-1
Understanding cognitive mechanisms of emotion regulation in aging	93.866	5R01AG043463-05		0	-43
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	-126
Alzheimer s Disease Research Center - Overall	93.866	5P50AG008702-30		0	-830
Biomarkers of Alzheimer's Disease in Adults with Down Syndrome	93.866	5U01AG051412-05		0	-1,944
Exercise, aging, and cognition: Effect and mechanisms	93.866	5R01AG033546-05		0	-2,472
Long Life Family Study: Columbia University	93.866	5U01AG023749-13		0	-12,708
Analyzing age-related changes of brain activation in subjects native space	93.866	5K01AG044467-05		0	-34,528
Long Life Family Study: Columbia University	93.866	5U01AG023749-13		0	-50,754
				\$12,554,779	\$51,981,450
Vision Research					
Retinal Disease Promoted by Iron-Induced Bisretinoid Oxidation	93.867	5R01EY028131-02		215,290	665,658
Precision medicine for ABCA4 disease: modifier alleles	93.867	5R01EY028203-02		0	632,941
Endogenous neural activity: neurophysiology, optical imaging, fMRI, and behavior.	93.867	5R01EY025330-04		240,197	625,147
Structural basis of receptor-mediated cellular vitamin A uptake	93.867	5R01EY027405-03		136,810	566,198

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Molecular physiology of cyclic nucleotide-gated channels	93.867	5R01EY027800-03		0	(Includes Subrecipients) 506,060
Signaling Mechanisms of Lens Development	93.867	5R01EY017061-13		0	467,415
Impact of Lipofuscin in Retinal Pigment Epithelial Cells	93.867	5R01EY012951-19		0	452,617
Receptor Tyrosine Kinase Activity in Drosophila Eye Development	93.867	5R01EY026217-04		0	446,899
Measures of Human Receptor and Post Receptor Activity	93.867	5R01EY009076-26		216,203	431,694
Pharmacological treatment for atrophic age-related macular degeneration compounded by common forms of age-related amyloid disease	93.867	5R01EY028549-02		157,623	430,245
Core Facilities for Vision Research	93.867	5P30EY019007-08		0	423,300
Defining Barriers to Gene Therapy	93.867	5R01EY018213-11		0	414,529
Therapeutic Corneal Cross-Linking using Formaldehyde Releasing agents	93.867	5R01EY020495-09		0	388,110
Neural circuit mechanisms for color vision	93.867	5R01EY029311-02		0	375,14
Core Facilities for Vision Research	93.867	5P30EY019007-08		0	363,548
The Neurophysiology of Visual Search: Oculomotor and Visual Mechanisms	93.867	5R01EY017039-10		0	353,926
PDGF signaling in lens development	93.867	5R01EY025933-05		0	340,789
Ocular hemodynamics of rat model of glaucoma	93.867	5R01EY028550-02		67,173	337,739
Ultrasound perfusion imaging in glaucoma	93.867	5R01EY025215-04		76,399	329,019
Top-down selection of task-relevant cues: neural mechanisms in the frontal and parietal lobes	93.867	5R01EY025965-05		0	325,912
Gene Silencing and Gene Editing in Phototransduction	93.867	5R01EY024698-04		55,079	323,956
Imaging Functional Connectivity in Visual Cortex	93.867	5R01EY011787-18		0	307,553
The role of the cerebellum in visual learning	93.867	5R21EY028749-02		36,261	295,965
The role of the ciliary margin zone and Cyclin D2 in patterning the binocular projection on	93.867	2R01EY015290-14A1		0	294,485

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Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Studying models and mechanisms of optic nerve diseases	93.867	5R01EY002115-41		0	(Includes Subrecipients) 281,265
Optimal calcium imaging with shaped excitation	93.867	5R21EY027592-02		0	272,789
Regulation of Glia-driven Neuroinflammation in Glaucoma	93.867	5R01EY028153-02		0	265,812
The role of cortical feedback in visual face processing	93.867	5R00EY022671-05		0	225,739
Pharmacological modulation of thevisual phototransduction cascade for treatment of diabetic retinopathy	93.867	5R21EY027027-02		0	206,018
Imaging Functional Connectivity in Visual Cortex	93.867	5R01EY011787-18		0	203,018
Regulation of FGF signaling in lacrimal gland develop	93.867	5R01EY018868-09		0	187,620
Vision Sciences Training Grant	93.867	5T32EY013933-18		0	171,063
CRCNS: Theory-guided studies of cortical mechanisms of multi-input integration	93.867	5R01EY029999-02		116,248	155,867
Genetics of refractive error development in the mouse model	93.867	5R01EY023839-04		12,841	131,272
Growth and Guidance of Retinal Axon	93.867	5R01EY012736-28		0	116,446
Stargardt disease with low lipofuscin	93.867	1R01EY028954-01A1		0	108,438
Quantitative Fundus Autofluorescence in Retinal Disorders	93.867	2R01EY024091-05		0	93,702
Structural and Functional Progression of Glaucomatous Damage to the Macula	93.867	5R01EY025253-03		0	88,975
Investigating the role of intracellular calcium concentration on STRA6- mediated retinol uptake	93.867	5F31EY029591-02		0	44,524
The effect of locomotion-induced octopamine release on motion detection circuits in Drosophila	93.867	5F31EY029592-02		0	44,524
Quantitative Fundus Autofluorescence in Retinal Disorders	93.867	5R01EY024091-04		0	24,546
Mechanisms of Visual Perception	93.867	5R01EY011378-20		0	22,036
Photoreceptor specification in the Drosophila eye	93.867	4R01EY023635-04		0	17,551
Therapeutic Corneal Cross-Linking using Formaldehyde Releasing agents	93.867	5R01EY020495-09		0	16,981

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Vision Sciences Training Grant	93.867	5T32EY013933-18		0	16,675
Integrated clinical, genetic and functional analysis of the ABCA4 locus	93.867	1R01EY029315-01A1		0	10,456
The Role of Zic Genes in Patterning the Binocular Projection	93.867	4R01EY015290-13		0	-1
Role of oculomotor proprioception in spatial processing by the parietal cortex	93.867	5K08EY023265-05		0	-1
Defining Barriers to Gene Therapy	93.867	5R01EY018213-09		0	-15,341
				\$1,330,124	\$12,788,828
Medical Library Assistance					
Training in Biomedical Informatics at Columbia University	93.879	5T15LM007079-28		0	876,631
Deep phenotyping in Electronic Health Records for Genomic Medicine	93.879	5R01LM012895-02		283,359	640,025
Bridging the Semantic Gap Between Research Eligibility Criteria and Clinical Data	93.879	5R01LM009886-10		100,590	465,201
Discovering and Applying Knowledge in Clinical Databases	93.879	5R01LM006910-18		0	251,411
Mechanistic Machine Learning	93.879	1R01LM012734-01		84,934	150,091
Conexion: A localized information resource for a low-income Hispanic community	93.879	5G08LM012689-03		0	100,183
Discovering and Applying Knowledge in Clinical Databases	93.879	2R01LM006910-19		0	67,589
Probabilistic modeling of observational clinical data for high-throughput inference of disease phenotypes	93.879	5F31LM012894-02		0	49,524
Training in Biomedical Informatics at Columbia University	93.879	5T15LM007079-28		0	38,591
PhendoPHL:A Data-Science Enabled Personal Health Library to Manage Endometriosis	93.879	1R01LM013043-01		0	29,322
Prefrontal cortex and adolescent binge drinking: Role of HCN channels	93.879	1F31LM013054-01		0	25,008
Big Data Methods for Comprehensive Similarity based Risk Prediction	93.879	1R01LM013061-01		0	19,475
Big Data Methods for Comprehensive Similarity based Risk Prediction	93.879	1R01LM013061-01		0	16,730

## The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

For ye	ear end	ed June	30, 2	2019
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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Discovering and Applying Knowledge in Clinical Databases	93.879	5R01LM006910-18		0	15,818
				\$468,883	\$2,745,599
nternational Research and Research Training					
Health and Psychosocial Need: The Asenze study of risk and protection in adolescence	93.989	5R01TW011228-02		84,456	281,408
Impact of a multimodal intervention to reduce dual stigma and improve treatment outcomes in HIV/Drugresistant TB co-infected patients in KwaZulu-Natal, South Africa	93.989	5R21TW011077-02		103,377	177,189
Adapting the WHO Cardiovascular Disease Risk Management Package to the Ghanaian Community-Based Health Planning and Services (CHPS) Primary Care Model: An Implementation Pilot Study	93.989	5R21TW010452-02		60,964	88,059
Domestic Violence Attitudes and Culturally Appropriate Prevention in Pakistan	93.989	5R21TW010443-02		2,937	48,829
				\$251,734	\$595,485
Total Direct Award Programs				\$78,493,752	\$471,393,052
Pass-through Awards					
National Cancer Institute/NIH/DHHS					
Taspase1 crystallography	93	LEIDOS 16X137	HHSN261200800001E	0	80,307
Chemoprevention of Esophageal Cancer in a Mouse Model of Barrett's Esophagus	93	CUMC 16040641-01	HHSN26120150000391	34,918	34,918
Designing a Prototype of N-of1 trials of Depressive symptom management in Cancer Survivors	93	LEIDOS 15X142	HHSN261200800001E	0	17,733
Pilot Study of Denosumab in BRCA1/2 Mutation Carriers Scheduled for Risk-Reducing Salpingo-Oophorectomy	93	UTMDA 3001109242	HHSN261201200034I	0	6,484
Breast Cancer Prevention Study	93	VENTWELL 17RWSK002	HHSN261201400002B	0	3,146
VAIDS Trial: Phase II trial of the E75 Peptide Vaccine in Women with DCIS Breast Cancer	93	UTMDA 00003832	HHSN261201200034I	0	-1
Chemoprevention of Esophageal Cancer in a Mouse Model of Barrett's Esophagus	93	CUMC 16040641-01	HHSN26120150000391	0	-3,115
VAIDS Trial: Phase II trial of the E75 Peptide Vaccine in Women with DCIS Breast Cancer	93	UTMDA 00003832	HHSN261201200034I	0	-3,600

National Heart, Lung, and Blood Institute/NIH/DHHS

For year ended June 30, 2019

<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
93	UWASH UWSC8537	HHSN268201500003I	0	(Includes Subrecipients) 516,429
93	UWASH UWSC8537	HHSN268201500003I	0	148,480
93	UWASH UWSC8537	HHSN268201500003I	0	-42,890
93	UOR 416861-G-2	HHSN272201400005C	0	49,210
93	CDUKE 218094	HHSN-2752010000031	0	7,792
93	DUKE 201316	HHSN-275201000031	0	6,290
93	SPSLLC SPS-1	1R41HL129754-01A1	0	13,778
			\$34,918	\$834,957
93.077	RUTGER 0816	1U54CA229973-01	0	51,388
93.077	JHU 2004225064	1R01ES030025-01	0	37,01
93.077	JH 2003435348	R01HL134149	0	9,05^
			\$0	\$97,450
93.113	OSU P0421A-B	4R33ES024718-02	0	207,866
93.113	HFHS CU13-3167	2R01ES011126-11A1	0	99,942
	93 93 93 93 93 93 93 93 93 93 93 93 93 9	93 UWASH UWSC8537  93 UWASH UWSC8537  93 UWASH UWSC8537  93 UOR 416861-G-2  93 CDUKE 218094  93 DUKE 201316  93 SPSLLC SPS-1  93.077 RUTGER 0816  93.077 JHU 2004225064  93.077 JH 2003435348	93 UWASH UWSC8537 HHSN268201500003I  93 UWASH UWSC8537 HHSN268201500003I  93 UWASH UWSC8537 HHSN268201500003I  93 UOR 416861-G-2 HHSN272201400005C  93 CDUKE 218094 HHSN-2752010000031  93 DUKE 201316 HHSN-275201000031  93 SPSLLC SPS-1 1R41HL129754-01A1  93.077 RUTGER 0816 1U54CA229973-01  93.077 JHU 2004225064 1R01ES030025-01  93.077 JH 2003435348 R01HL134149	93 UWASH UWSC8537 HHSN2682015000031 0 93 UWASH UWSC8537 HHSN2682015000031 0 93 UWASH UWSC8537 HHSN2682015000031 0 93 UOR 416861-G-2 HHSN2722201400005C 0 93 CDUKE 218094 HHSN-2752010000031 0 93 DUKE 201316 HHSN-275201000031 0 93 SPSLLC SPS-1 1R41HL129754-01A1 0 93 SPSLLC SPS-1 1R41HL129754-01A1 0 93.077 RUTGER 0816 1U54CA229973-01 0 93.077 JHU 2004225064 1R01ES030025-01 0 93.077 JH 2003435348 R01HL134149 0 90 S0

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Air Particulate, Metals, and Cognitive Performance in an Aging Cohort- Roles of Circulating Extracellular Vesicles and Non-coding RNAs	93.113	HARVARD 112557-5108340	1R01ES027747-01	0	(Includes Subrecipients) 89,081
Participatory Interventions to Reduce Arsenic Exposure in American Indian Communities	93.113	JHU 2003073212	5R01ES025135-02	0	81,013
The Effects of Environmental Exposures on Semen Quality and the Sperm Epigenome.	93.113	BWH 118582	1R01ES028712-01	0	25,950
SPIROMICS - Air Polution Study	93.113	JH 2002161671	1R01ES023500-01	0	24,198
Manganese-related Neurotoxicity in Asymptomatic Welders	93.113	PSU COLES019672	R01ES019672	0	20,421
Synergistic Immunosuppression by PAHs and Arsenite: Project 3 - Santella	93.113	UNMEX 3RJ12	3R01ES019968-03S1	0	20,209
The Programming Research in Obesity, Growth, Environmental and Social Stress (PROGRESS) Cohort	93.113	ISMM 0255-4921-4609	5R24ES028622-02	0	19,480
Coordinating Center for the Breast Cancer and the Environment Research Program	93.113	UWM 855K610	5U01ES026127-04	0	18,097
Comparison of Breast Tissue Characteristics in Women and Adolescents using Optical Spectroscopy and	93.113	UW 782K180	1U01ES026127-01	12,480	12,480
Maternal Exposure to Inorganic Arsenic in Drinking Water and Adverse Birth Outcomes in Rural Colorado	93.113	UCOL FY18.659.003	1R21ES028416-01A1	0	11,439
The impact of air pollution exposure on Alzheimer s disease and dementia: a national study	93.113	HARVARD 112518-5110043	3R01ES024332-04S1	0	7,367
Arsenic and Immune Response to Influenza Vaccination in Pregnant Women and Newborns	93.113	JHU 2003603451	R01ES026973	0	2,284
				\$12,480	\$733,555
Oral Diseases and Disorders Research					
Protease/PAR2/TRPV4 Axis and Oral Cancer Pain	93.121	NYU F8807-02	1R01DE026806-01A1	0	337,696
Development of Drug Delivery Technology for Stem Cell-Based TMJ Regeneration	93.121	WnT Scientific CU18-0546	1R41DE028215-01	0	98,715
Integrating Social & Systems Science Approaches to Promote Oral Health Equity	93.121	NYU CU12-0650	1R01DE023072-01	0	23,897
				\$0	\$460,308
Human Genome Research					
Fully Integrated Single Cell Imaging and RNA-Seq Library Preparation	93.172	CMICRO CU17-1067	9R44HG010003-02A1	0	157,393

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
New York Center for Collaborative Research in Common Disease Genomics	93.172	UMI-CU-Goldstein-3	1UM1HG00890-01	0	(Includes Subrecipients) 59,701
New York Center for Collaborative Research in Genomics	93.172	NYGC UM1-CU-TLapp-04	1UM1HG008901-01	0	51,645
Genomic Medicine Pilot For Hypertension and Kidney Disease in Primary Care	93.172	0255-6178-4509	4U01HG007278-04	0	48,684
New York Center for Collaborative Research in Common Disease Genomics	93.172	UMI-CU-Goldstein-3	1UM1HG00890-01	0	41,621
Incorporating Local Haplotype Sharing to Detect Genetic Associations	93.172	DUKEU A030961	7R01HG008157-05	0	38,010
Health Care Provider responses to receiving unsolicited genomic results	93.172	GENFD0001649725	1R01HG010004-01	0	37,254
New York Center for Collaborative Research in Genomics	93.172	NYGC UM1-CU-TLapp-04	1UM1HG008901-01	0	28,154
Exome sequencing in Diverse Populations in Colorado & Oregon	93.172	KAISER OOS030229-Columbia	2U01HG007292-06	0	27,305
				\$0	\$489,767
Research Related to Deafness and Communication Disorders					
Risk Factors for Hearing Loss	93.173	BWH 107066	5U01DC010811-05	0	11,316
Randomized Controlled Trial of Valganciclovir for Asymptomatic Cytomegalovirus Infected Hearing Impaired Infants (ValEAR Trial)	93.173	UUMC 10041913-010	1U01DC014706-01A1	0	2,941
				\$0	\$14,257
Research and Training in Complementary and Integrative Health					
Metals in the Trial to Assess Chelation Therapy 2 (TACT2)	93.213	MSMCM R01 AT009273	1R01AT009273-01	0	351,682
Comprehensive CBT via reSET for a Hub and Spoke MAT System of Care	93.213	PSU COLAT010118	1R21AT010118-01	0	30,441
Metals in the Trial to Assess Chelation Therapy 2 (TACT2)	93.213	MSMCM R01 AT009273	1R01AT009273-01	0	29,181
Creatine Safety, Tolerability & Efficacy in Huntington's Disease (CREST-E)	93.213	MGH CU09-3943	5 U01 AT000613	0	-3,620
				\$0	\$407,684

**Mental Health Research Grants** 

For year ended June 30, 2019

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
EEG/MRI Controlled TMS Real-Time Neural Feedback in Anti-Depressive Treatment	93.242	MUSC 15-020-8B142	4R33MH106775-04	0	177,507
Peer-Led Healthy Lifestyle Program in Supportive Housing	93.242	WASHU WU-17-430	7R01MH10457-04	0	149,606
Effect of GABAergic Inhibition of Dendritic Spines on Synaptic Pruning in mPFC During Adolescence	93.242	SUNYRF 100-1151016-83329	1R01MH11590001A1	0	124,756
Électrohysiology of human spatial cognition	93.242	UPENN 563386	5R01MH061975-16	0	118,364
Statistical models for fine mapping and functional interpretation of loci associated to schizophreni	93.242	NYGC 14-3011	R01MH106842	0	114,627
Biomarkers of Conversion Risk and Treatment Response in Early-Stage Schizophrenia	93.242	CUMC 192828	1R01MH110270-01A1	0	113,379
OnTrackChile for First Episode Psychosis	93.242	UOH CU17-1224	1U01MH15502-01	0	111,930
Hippocampal memory circuits in delusions	93.242	NYU 17-A1-00-006880-01	1R01MH112733-01A1	0	108,568
Neurophysiology of Auditory Emotion Recognition in the Human Brain	93.242	FIMR 500771CU	1R21MH114166-02	0	103,757
Genetic neuroscience: How human genes and alleles shape neuronal phenotypes	93.242	BRINST 5100482-5500001084	1U01MH115727-02	0	100,000
Characterizing Cognition Acrioss the Lifespan in Untreated Psychosis in China	93.242	NYU F8752-04	7R01MH108385-03	0	86,011
Improving Cognition via Exercise in Schizophrenia	93.242	MSSM 0255-3351-4609	1R01MH110623-01A1	0	76,483
Improving the Emergency Department Management of Deliberate Self-Harm	93.242	UPENN 568947/10052478/19439	1R01MH107452-01A1	0	73,179
Determinants for Resilience in Youth with HIV infection and Youth affected by HIV	93.242	HJFAMM 832613	5R01MH102151-03	0	65,776
Large-Aperture Electrically Tunable Lenses with 40 Microsecond Hysteresis-Free Response for Remote Focusing	93.242	BNLS CU17-2671	5R44MH117430-03	0	64,297
Suubi4Her: A Combination Intervention Addressing HIV Risk Behaviors Among Older Adolescent Girls Transitioning into Adulthood in Uganda	93.242	WU-18-219	1R01MH113486-01	0	60,362
Impact of Trauma Exposure on Critical Periods in Brain Development	93.242	EMORYU T702382	5R01MH111682-02	0	58,720
ED-SAFE-2: Translating Safety Planning into Practice	93.242	UMASS WA00318982/RFS2016003	3 5R01MH106726-02	0	47,323
Mobile Assessment for the Prediction of Suicide (MAPS)	93.242	OREGON 281450B	5U01MH1163923-02	0	45,713
Biotyping Placebo and Treatment-Specific Responses for Precision Medicine	93.242	17-A0-00-007642-01	2R01MH099003-06	0	44,148

For year ended June 30, 2019

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Improving Cognition via Exercise in Schizophrenia	93.242	MSSM 0255-3351-4609	1R01MH110623-01A1	0	36,736
Family psychoeducation for adults with psychotic disorders in Tanzania (Study)	93.242	DU A030978	1R34MH106663-01A1	0	36,102
Connectomes Related to Anxiety and Depression in Adolescents	93.242	MIT S5416 PO194771	1U01MH108168-01	0	35,870
Biotyping Placebo and Treatment-Specific Responses for Precision Medicine	93.242	17-A0-00-007642-01	2R01MH099003-06	0	32,875
Suicide Risk Reduction in the Year Following Jail Release	93.242	MSU RC105383CU	1U01MH106660-01A1	0	30,162
Genetic neuroscience: How human genes and alleles shape neuronal phenotypes	93.242	BRINST 5100482-5500001084	1U01MH115727-02	0	29,788
VITAL Start (Video-intervention to Inspire Treatment Adherence for Life): Brief facility based video intervention to improve retention and adherence to ART among pregnant and breastfeeding women	93.242	BCM 7000000715	1R01MH115793-01A1	0	28,720
Biopsychosocial mechanisms underlying internalizing psychopathology in a prospective, population-based cohort of sexual minority young adults	93.242	YU GR105699 (CON-80001709)	1R01MH118245-01	0	24,502
Identifying Social Processes Implicated in Remitted Recurrent Depression	93.242	UIL 16731	1R21MH112330-01	0	22,636
Transforming mental health delivery through behavioral economics and implementation science	93.242	UPENN 577594	1P50MH113840-01	0	22,188
NNCI Synapse: Development of a mobile application to disseminate neuroscience training to medical professionals	93.242	CFSI CU17-1085	1R44MH11546-01	0	20,137
Neurophysiology of Auditory Emotion Recognition in the Human Brain	93.242	FIMR 500771CU	1R21MH114166-02	0	16,583
An Adaptive Algorithm-Based Approach to Treatment for Adolescent Depression	93.242	UMINN N006073701	1R01MH113748-01	0	16,478
Mobile Adaptation and Testing of a Uniquely Targeted HIV Intervention for Young Transgender Women	93.242	BU 00001275	1R56MH113684-01A1	0	16,470
Addressing Psychiatrist Workforce Shortages in the U.S. with Psychiatric Advanced Practice Registered Nurses	93.242	UMARY 1802161	1R01MH113650-01	0	14,329
In Utero Assessment of the Human Neural Connectome and Later Child Behavior	93.242	NYU 18-A0-00-1001852	7R01MH110793-04	0	11,852
A unified intervention for young gay and bisexual men's minority stress, mental health, and HIV risk	93.242	YU GR105649 (CON-80001695)	5R01MH109413-04	0	8,282
Web-Based Therapist Training on Complicated Grief Therapy	93.242	CFT C001	1R41MH118126-01A1	0	7,513
Optimizing Youth Suicide Risk Screening in the Emergency Department	93.242	UMICH 3003330094	UMH104311	0	5,490
Influence of neighborhoods and networks on the HIV care continuum among HIV-infected MSM in NYC	93.242	NYBC NIH000491	1R56MH112401-01A1	0	5,047

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Mechanisms and Longitudinal Effects of Stigma on Women s Adherence and Outcomes	93.242	UAB 000506211-005	1R01MH104114-01	0	4,979
Prenatal and Neonatal Risk Factors for Adverse Neurodevelopmental Outcomes in Childhood and Early Adulthood	93.242	SUBK00009692	1R21MH120824-01A1	0	4,897
In Utero Assessment of the Human Neural Connectome and Later Child Behavior	93.242	NYU 18-A0-00-1001852	7R01MH110793-04	0	3,973
NNCI Synapse: Development of a mobile application to disseminate neuroscience training to medical professionals	93.242	CFSI CU17-1085	1R44MH11546-01	0	3,006
Peer-Led Healthy Lifestyle Program in Supportive Housing	93.242	WASHU WU-17-430	7R01MH10457-04	0	1,522
África Focus on Intervention Research for Mental Health (AFFIRM)	93.242	UCT 5	U19 MH095699	0	192
Development of GSK3beta PET Radioligands for In Vivo Imaging in Brain	93.242	WUBGSM WFUHS 115188	R21MH112307	0	-36
Promoting Research Training During Psychiatry Residency	93.242	BROWNU 00000705	5R25MH101076-03	0	-128
In utero Assessment of the Human Neural Connectome and later Child Behavior	93.242	WAYNE 16127	1R01MH110793-01	0	-3,354
Bluntant and Discordant Affect: A Transdiagnositc Construct in Psychopathology	93.242	UPMC 0025282(123087-2)	1R01MH096334-01	0	-5,611
				\$0	\$2,275,706
Alcohol Research Programs					
Impact of supportive policies on minority stress, drinking and health among women	93.273	UIL 16343	2R01AA013328-10A1	0	221,711
A Randomized Trial of Abandoned Housing Remediation, Substance Abuse and Violence	93.273	UPENN 569453	1R01AA024941-01	0	111,820
Álcohol Áctions-Molecular Targets on Brain Proteins	93.273	UTEXAUS UTA16-000568	R01AA06399	0	41,916
Dose and Pattern of Adverse Effects in the Diagnosis of Fetal Alcohol Spectrum Disorders: A Secondary Analysis of Data from Five Cohorts	93.273	WSU18044	1R01AA025905-01 .	0	38,180
Next Generation Rare Variant Discovery in Multiplex AD Families	93.273	UPITT 0045432	1R01AA021746-01	0	24,882
Sexual Orientation, Discrimination, and Health Disparities in DSM-5 Alcohol Use Disorder	93.273	UMICHG 300914461	1R01AA0256841-01	0	18,851
Molecular Subtypes for Targeted Therapies in Alcoholic Hepatitis	93.273	UPITT 0059011 130258-5	7U1AA021908-05	0	11,680
Structural Analysis of Alcohol-Dependent Activation of GIRKs	93.273	ISMMS 0255-5042-4609	2R01AA018734-06A1	0	9,727

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Gene network perturbations in alcohol dependence - A systems biology approach	93.273	TSRI PO No. 5-53365	1R01AA021667-01A1	0	8,470
				\$0	\$487,237
Drug Abuse and Addiction Research Programs					
Micro- to Nanoscale Neurotransmitter Sensors	93.279	UCLA 2000GVG295	1R01DA045550-01	0	332,866
Florida Node Alliance of the Drug Abuse Clinic Trials Network-CTN 0064	93.279	UMIAMI SPC-001112	3UG1DA013720-16S1	0	292,431
Florida Node Alliance of the Drug Abuse Clinic Trials Network CTN 0067	93.279	UMIAMI SPC-001111	2UG1DA013720-16	0	184,687
Florida Node Alliance of the Drug Abuse Clinic Trials Network	93.279	UMIAMI SPC-001088	2UG1DA013720-16	0	181,729
Clinical Trials Network: Greater New York Node (CTN-0068)	93.279	NYU 15-A0-00-003671-01	3UG1DA013035-16S3	0	106,861
Pharmacological Probes Based on Mitragynine Pseudoindoxyl	93.279	SLCP 807-1-01	1R21DA045884-01	0	92,731
Clinical Trials Network: Greater New York Node	93.279	19-A0-S1-003671-01	2UG1DA013035-14	0	77,526
Clinical Trials Network: Greater New York Node (CTN-0051)	93.279	NYU 16-A0-S4-003671-01	3UG1DA013036-14S4	0	63,198
Drug Use Among Nightclub and Dance Festival Attendees in New York City	93.279	NYUSM 18-A1-00-007403-01	1R01DA044207-01A1	0	62,300
CRCNS: Computational and Neural Mechanisms of Memory-guided Decisions	93.279	PU SUB0000170	5R01DA038891-04	0	59,646
Metropolitan Trajectories of HIV Epidemics, Drug Use, and Responses in US Key Populations	93.279	EMORYU T425319	5R01DA037568-02	0	58,330
Monitoring the Future: Drug Use and Lifestyles of American Youth	93.279	UMICHG 3004489406	2R01DA001411-43	0	57,958
New York State Health Home Impact on HIV Treatment Cascade	93.279	CASAC CU13-3389	5R01DA038193-05	0	51,899
The health and social consequences of national marijuana legalization	93.279	NYUSM 19-A0-00-1001918	7R01DA040924-04	0	51,846
Examining the synergistic effects of cannabis and prescription opioid policies on chronic pain, opioid prescribing, and opioid poisoning	93.279	19-A0-00-1002539	1R01DA045872-01A1	0	50,372
Systems Biology of HIV, methanphetamine and antiretrovirals interactions	93.279	SCRIPPS 5-53218	1R01DA041750-01	0	49,047
A Natural History Study of Buprenorphine Diversion, Self Treatment and Engagement with Formal Treatment Services	93.279	WSU 670244-1	1R01DA040811-01A1	0	41,597

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures (Includes Subrecipients)
NIDA CU17-2611 2017 NIDA Inserm Drug abuse Research Fellowship	93.279	NIDA CU17-2611	NIDA	0	36,295
Florida Node Alliance of the Drug Abuse Clinic Trials Network CTN 0067	93.279	UMIAMI SPC-001111	2UG1DA013720-16	0	25,374
Sexual Orientation Differences: Prevalence and Correlates of Substance Use and Abuse	93.279	PHI 00394	5R01DA036606-03	0	25,100
Collaborating Consoritium of Cohorts Producing NIDA Opportunities (C3PNO)	93.279	UCLA 1935 G WA235	5U24DA04454-02	0	20,008
NIDA CU17-2611 2017 NIDA Inserm Drug abuse Research Fellowship	93.279	NIDA CU17-2611	NIDA	0	18,751
Vaccines for Prescription Opiod and Heroin Abuse	93.279	MNMRF 07428-2	5U01DA038876-03	0	18,632
Social Networks, Physician Characteristics, and Inappropriate Prescribing of Commonly Misused Prescription Drugs	93.279	YU GR102657(CON-80001241)	1R01DA044981-01A1	0	18,434
HIV/Drug Abuse Prevention Research Ethics Training Institute	93.279	FORD0034	5R25DA031608-07	0	16,541
The Impact of State Healthcare Reforms on Treatment of Substance Use Disorders	93.279	JH 2003027470	1R01DA039863-01A1	0	16,506
Translational Research Traninig on Addiction for Racial/ Ethnic Minorities	93.279	RFCUNY CM0000-864	5R25DA035161-05	0	14,151
Does medical cannabis reduce opioid analgesics in HIV+ and HIV adults with pain?	93.279	AECM 311147	1R01DA044171-01A1	0	14,075
Missing Data Matters: Substance Use Disorder Clinical Trials	93.279	JHU 2004036781	1R01DA046534-01	0	13,003
Systems Biology of HIV, methanphetamine and antiretrovirals interactions	93.279	SCRIPPS 5-53218	1R01DA041750-01	0	9,155
Evaluating ART for all HIV Seropositive: Can it work with the Hardest Case?	93.279	ISMMS 0255-0781-4609	7R01DA035707-04	0	8,336
Vaccines for Fentanyl and Its Derivatives: A Strategy to Reduce Illicit Use and Overdose	93.279	MMRF N007622802	1UG3DA048386-01	0	7,766
Prescription drug monitoring programs and opioid-related harm	93.279	19-A0-00-1001809	7R01DA039962-04	0	7,647
Acute Pain Management and Longterm Opioid Use after Surgery	93.279	SBRI 2017-1217	1R01DA042299-01A1	0	6,017
The health and social consequences of national marijuana legalization	93.279	UCD 201601382-01	1R01DA040924-01A1	0	5,761
Prescription drug monitoring programs and opiod-related harm	93.279	UCD 201504235-01	1R01DA039962-01A1	0	4,774
Clinical Trials Network: Greater New York Node (CTN-0068)	93.279	NYU 15-A0-00-003671-01	3UG1DA013035-16S3	0	3,042

#### The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CEDA	Drainet No.	Door through Contract Number	Out an ainingto	R&D Cluster
<del>-</del>	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Novel Longitudinal Methods for SMART Studies of Drug Abuse an HIV	93.279	UMICH 3003778400	1R01DA039901-01	0	2,554
Florida Node Allliance of the Drug Abuse Clinic Trials Network	93.279	UMIAMI SPC-001088	2UG1DA013720-16	0	-1,556
Impact of the growing mental health disparity in smoking on the enduring tobacco epidemic	93.279	RFCUNY 41896A	5R01DA020892-07	0	-8,389
				\$0	\$2,097,001
Discovery and Applied Research for Technological Innovations to Improv	e Human Health	1			
Tissue Engineering Resource Center (TERC)	93.286	TUFTS 100228	5P41EB002520-15	0	594,797
Imaging Human brain Function with Minimal Mobility Restrictions	93.286	UMINN N006264801	U01EB025153	0	318,604
Imaging Human brain Function with Minimal Mobility Restrictions	93.286	UMINN N006264801	U01EB025153	0	234,277
Bio-electrochemical detectors for in vivo continuous monitoring	93.286	USCB KK1836	1R01EB022015-01A1	0	215,520
Imaging Human brain Function with Minimal Mobility Restrictions	93.286	UMINN N006264801	U01EB025153	0	114,762
Causal Inference for Neuroimaging	93.286	JH 2003851642	2R01EB016061-05A1	0	75,000
Fast Functional MRI with sparse sampling and model-based reconstruction	93.286	UM SUBK00009808	3R01EB023618-02S1	0	42,752
Imaging Human brain Function with Minimal Mobility Restrictions	93.286	UMINN N006264801	U01EB025153	0	37,725
Cross-Scale Interactions Between Mineral and Collagen for Tendon-Bone Attachment	93.286	WU-18-159	5U01EB016422-03	0	6,896
				\$0	\$1,640,333
Minority Health and Health Disparities Research					
Racial Disparity Reduction in the National Kidney Allocation Policy	93.307	EMORY T436682	1R01MD010290-01	0	40,025
Maternal trauma, circulating microRNA in extracellular vesicles, and programming of childhood respiratory outcomes	93.307	ISMMS 0255-B281-4609	1R01MD013310-01	0	37,068
Peer-Administered Asthma Self-Management Intervention in Urban Middle Schools	93.307	RIH 710-7137328	1R01MD012225-01	0	25,965
Genomic Analysis of Enhanced Response to Heart Failure Therapy in African Americans	93.307	UPITT 0041119	1R01MD009118-01	0	9,554

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CEDA	Drainat No.	Dage through Contract Number	Outer similaret	R&D Cluster
ederal Grantor / r ass-unough Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients 	Total Expenditures (Includes Subrecipients) \$112,612
Trans MILL Becoarch Sunnert				φυ	φ112,012
rans-NIH Research Support					
Exposome Contributors to Child Health Originating from National Fetal Growth Study (ECCHO-NFGS)	93.310	MUSC16-086-8C267	1UG3OD023316-01	0	867,607
Data and Research Support Center	93.310	VUMC 59350	1U2COD23196-01	0	596,870
Data and Research Support Center	93.310	VUMC 59350	1U2COD23196-01	0	428,535
Environmental Influences on Child Health Outcomes in the Northern Plains Safe Passage Study Cohort	93.310	AMH 4UH3OD02327-B	4UH3OD023279	0	279,662
Children's Respiratory Research and Environment Workgroup (CREW)	93.310	UWM 800K450	1UG3OD023282-01	0	246,775
Environmental Influences on Child Health Outcomes in the Northern Plains Safe Passage Study Cohort	93.310	AVERA 4UH3OD023279-A	4UH3OD023279-04	0	201,282
An integrated and diverse genomic medicine program for undiagnoseddiseases	93.310	DUKEU A030502	2U01HG007672-05	0	175,194
National Exposure Assessment Laboratory at Emory	93.310	EMORYU A065065	1U2CES026560-01	0	161,042
Children's Respiratory Research and Environment Workgroup (CREW)	93.310	UWM 800K450	1UG3OD023282-01	0	147,418
Data and Research Support Center	93.310	VUMC 59350	1U2COD23196-01	0	139,155
Children's Respiratory Research and Environment Workgroup (CREW)	93.310	UWM 800K450	1UG3OD023282-01	0	115,897
Children's Respiratory Research and Environment Workgroup (CREW)	93.310	UWM 800K450	1UG3OD023282-01	0	103,980
Environmental Influences on Child Health Outcomes in the Northern Plains Safe Passage Study Cohort	93.310	AVERA ARIECOS118	7UG3OD023279-03	0	98,096
Exposome Contributors to Child Health Originating from National Fetal Growth Study (ECCHO-NFGS)	93.310	MUSC16-086-8C267	1UG3OD023316-01	0	87,309
Children's Respiratory Research and Environment Workgroup (CREW)	93.310	UWM 800K450	1UG3OD023282-01	0	64,142
Mount Sinai CHEAR Network Laboratory HUB	93.310	ISMMS 0855-0502-4609	1U2CES026561-01	0	54,702
CHEAR Center for Data Science	93.310	0255-0221-4609	1U2CES026555-01	0	52,622
Mount Sinai CHEAR Network Laboratory HUB	93.310	ISMMS 0855-0502-4609	1U2CES026561-01	0	41,708

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
ECHO Consortium on Perinatal Programming of Neurodevelopment	93.310	0255-2291-4609	1UG3OD023337-01	0	36,308
Environmental Influences on Child Health Outcomes in the Northern Plains Safe Passage Study Cohort	93.310	AMH 4UH3OD02327-B	4UH3OD023279	0	33,078
ECHO Consortium on Perinatal Programming of Neurodevelopment	93.310	0255-2291-4609	1UG3OD023337-01	0	32,895
An integrated and diverse genomic medicine program for undiagnosed diseases	93.310	DUKEU 2031865	1U01HG007672-01	0	24,692
Data and Research Support Center	93.310	VUMC 59350	1U2COD23196-01	0	24,000
Environmental Influences on Child Health Outcomes (ECHO) Coordinating Center	93.310	DU 2037592	1U2COD023375-01	0	20,762
Environmental Influences on Child Health Outcomes (ECHO) Coordinating Center	93.310	DU 2037592	1U2COD023375-01	0	14,948
Children's Respiratory Research and Environment Workgroup (CREW)	93.310	UWM 800K450	1UG3OD023282-01	0	14,535
Children's Respiratory and Environmental Workgroup (CREW)	93.310	UWIS 777K335	5UG3OD023282-02	0	11,753
Physical Activity Genomics, Epigenomics/transcriptiomics Site	93.310	ISMMS 0255-2441-4609	1U24DK112331-01	0	10,774
Children's Respiratory and Environmental Workgroup (CREW)	93.310	UWIS 777K335	5UG3OD023282-02	0	9,374
Physical Activity Genomics, Epigenomics/transcriptiomics Site	93.310	ISMMS 0255-2441-4609	1U24DK112331-01	0	7,883
Mount Sinai CHEAR Network Laboratory HUB	93.310	ISMMS 0855-0502-4609	1U2CES026561-01	0	5,388
Exposome Contributors to Child Health Originating from National Fetal Growth Study (ECCHO-NFGS)	93.310	MUSC16-086-8C267	1UG3OD023316-01	0	33
Exposome Contributors to Child Health Originating from National Fetal Growth Study (ECCHO-NFGS)	93.310	MUSC16-086-8C267	1UG3OD023316-01	0	-10,785
				\$0	\$4,097,634
National Center for Advancing Translational Sciences					
Open Health Natural Language Processing Collaboratory	93.350	MAORO COL-231278/65497608	1U01TR002062-01	0	267,776
Systemic Inflammation in Microphysiological Models of Muscle and Vascular Disease	93.350	DUKEU A03-0128	1UG3TR002142-01	0	184,194
University of Pittsburgh Clinical and Translational Science Institute ACT Supplement	93.350	UP 0055353 (130910-6)	3UL1TR001857-01S1	0	136,016

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Open Health Natural Language Processing Collaboratory	93.350	MAORO COL-231278/65497608	1U01TR002062-01	0	43,009
NIH Tissue Chip Testing Centers: Validating Microphysiological Systems (U24)	93.350	TAMU ID No. 50111	U24TR001950	0	27,524
Improving Clinical Trial Enrollment and Recruitment Education at CTSA hubs (I-CERCH)	93.350	VUMC 59243	1U24TR001579-01	0	19,672
NIH Tissue Chip Testing Centers: Validating Microphysiological Systems (U24)	93.350	TAMU ID No. 50111	U24TR001950	0	10,658
NIH Tissue Chip Testing Centers: Validating Microphysiological Systems (U24)	93.350	MIT 57092	1U24TR001951-01	0	4,171
Systemic Inflammation in Microphysiological Models of Muscle and Vascular Disease	93.350	DUKEU A03-0128	1UG3TR002142-01	0	2,034
				\$0	\$695,054
Research Infrastructure Programs					
California National Primate Research Center	93.351	UCAL A18-1798-S002	NIH R01	0	56,396
The Jackson Laboratory Center for Precision Genetics: From New Models to Novel Therapeutics	93.351	JACKSONLAB CU16-1083	1U54OD020351-01	0	32,160
The Jackson Laboratory Center for Precision Genetics: From New Models to Noel Therapeutics	93.351	JACKSONLAB CU14-2766	1U54OD020351-01	0	16,948
				\$0	\$105,504
21st Century Cures Act - Beau Biden Cancer Moonshot					
Transition to Metastatic State: Lung Cancer, Pancreatic Cancer and Brain Metastasis-Functional Unit 3	93.353	MSKCC BD524105	1U2CCA233284-01	0	88,979
				\$0	\$88,979
Cancer Cause and Prevention Research					
(PQ#9) Targeting leaky ryanodine receptor (RyR2) to treat and prevent chemotherapy-associated cognitive dysfunction in patients with breast cancer	93.393	IU IN4687657COL	1R01CA206025-01	0	247,316
Role of the p53 C-terminal domain in tissue homeostasis, tumor suppression, and oncogenesis	93.393	ISMMS 0255-0481-4609	5R01CA196234-04	0	189,235
Returning genetic research panel results for breast cancer susceptibility	93.393	UPENN 565533	1R01CA19871-01 REVISED	0	113,549
Advanced Development and Dissemination of EMERSE for Cancer Phenotyping from Medical Records	93.393	UMICHG 3004700011	U24CA204863	0	102,033

For year ended June 30, 2019

ederal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Definition of serum ribonucleoprotein composition and its regulation and function	00.000	DELL 01147 4405	114004470504	0	(Includes Subrecipients)
	93.393	RFU CU17-1425	U19CA179564	0	95,797
Role of the p53 C-terminal domain in tissue homeostasis, tumor suppression, and oncogenesis	93.393	ISMMS 0255-0481-4609	5R01CA196234-04	0	91,556
Genetics of Prostate Cancer in South Africa	93.393	DFCI 1204304	5U01CA184374-04	0	76,068
Structural Cell Biology of DNA Repair Machines	93.393	LBNL 7341650	2P01CA092584-16	0	56,000
Advanced Development and Dissemination of EMERSE for Cancer Phenotyping from Medical Records	93.393	UMICHG 3004700011	U24CA204863	0	40,277
Defining the Role of ERG in Modulating the AR Cistrome and Antiandrogen Sensitivity	93.393	MSKCC BD517911C	1R01CA193837-01	0	26,667
Molecular pathways of Inerleukin-13 in cutaneous T-cell lymphoma	93.393	UPITT 0051797 (128253-1)	1R21CA209107-01	0	25,472
Health, Stress, and Tobacco Use Disparities among Sexual Minority Populations	93.393	UMICH 3004610081	1R01CA212517	0	19,442
Enhancing responses to immune checkpoint blockade in melanoma via modulation of the microbiome	93.393	UTMD 3001244409	1R01CA219896-01A1	0	18,224
Detroit Research on Cancer Survivors (Detroit POCS)	93.393	WSU19061	1U01CA199240-01A1	0	16,697
Predictors of long-term cardiovascular disease among breast cancer survivors in an integrated health system	93.393	KFDNI RNG209338-CU-01	1R01CA214057-01A1	0	12,445
Detroit Research on Cancer Survivors (Detroit POCS)	93.393	WSU19061	1U01CA199240-01A1	0	11,703
ĆŤ DOSE ĆOLLÁBORÁŤORY	93.393	UCSF 9390sc	5R01CA181191-02	0	10,000
Structural Cell Biology of DNA Repair Machines	93.393	LBNL 7341650	2P01CA092584-16	0	6,794
MicroRNA and Breast Cancer: Functional Characterization in a Population-Based Study	93.393	MSSM 0255-6601-4609	1R01CA172460-01A1	0	5,584
Defining the Role of ERG in Modulating the AR Cistrome and Antiandrogen Sensitivity	93.393	MSKCC BD517911C	1R01CA193837-01	0	3,691
Genetics of Prostate Cancer in South Africa	93.393	WHC 1242102	5U01CA184374-03	0	2,001
Risk and Penetrance of Mutations from Breast Cancer Testing Panels	93.393	MAORO 65664148	1R01CA192393-01	0	447
				\$0	\$1,170,998

**Cancer Detection and Diagnosis Research** 

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Quantitative imaging tools to derive DW-MRI oncological biomarkers	93.394	MSKCC BD522043A	U01CA211205	0	232,503
Computational modeling of tumor burden by CT to advance cancer therapeutics	93.394	INOVA FP-152539-A	R01CA194783	0	186,107
Informatics Tools for Optimized Imaging Biomarkers for Cancer Research & Discovery	93.394	MGH 224943	5U24CA180927-02	0	132,350
Circulating Biomarker Consortium for Pancreatic Cancer Early Detection	93.394	DFCI 1283204	1U01CA210171-01	0	60,084
Quantitative imaging tools to derive DW-MRI oncological biomarkers	93.394	MSKCC BD522043A	U01CA211205	0	32,000
Informatics Tools for Optimized Imaging Biomarkers for Cancer Research & Discovery	93.394	MGH 224943	5U24CA180927-02	0	1,920
Tethered Capsule Endomicroscopy Natural History Study of Barrett sEsophagus	93.394	MGH 224449	5R01CA184102-03	0	960
MicroRNAs and Early Prostate Cancer Detection	93.394	COLCA178864	1R21CA178864-01	0	-11,381
				\$0	\$634,543
Cancer Treatment Research					
Maximizing Local Access to Therapeutic Deliveries in Glioblastoma	93.395	WFUHS 441111 CORE 3	P01CA207206	0	322,496
SWOG NCORP Research Base	93.395	ORHSUN 1005019 Columbia	1UGCA189974-01	0	126,941
Probiotics for Prevention of Acute Graft-vs-host Disease in Children with Cancer	93.395	UCD 201601437-01	1R01CA201788-01A1	0	102,226
Prognostic biomarkers and disease drivers in T-cell acute lymphoblastic leukemia	93.395	MMC CU16-1319	5U10CA180827-03	0	67,532
SWOG Network Group Operations Center of the NCTN	93.395	ORHSUN 9009627 COLUMBIA	U10CA180888-03	0	56,916
SWOG NCORP Research Base	93.395	ORHSUN 1005019 Columbia Crew	5UG1CA189974-03	0	45,373
Determining efficacy of combined inhibition of glutaminase and receptor tyrosine kinase activity by CB-839 and Pazopanib respectively in mouse xenograft models of NF1 mutant/null soft tissue sarcoma	93.395	COL-213126/PO #65651049	3UM1CA186686-03S1	0	40,970
Investigating the molecular mechanism that mediates the addiction of inflammatory breast cancer cells to HDAC6 function	93.395	ISMMS 0255-1701-4609	1R01CA201162-01A1	0	37,494
SWOG NCORP Research Base	93.395	ORHSUN 1005019 Columbia	1UGCA189974-01	0	26,251
Anticancer agents from Diverse Natural products sources	93.395	UNCG 130239	2P01CA125066-06A1	0	25,819

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
A prospective observational cohort study to develop a predictive model of taxane-induced peripheral neuropathy	93.395	ORHSUN 1005019 COLUMBIA	Trived 5UG1CA189974-05	0	(Includes Subrecipients) 20,373
Maximizing Local Access to Therapeutic Deliveries in Glioblastoma	93.395	WFUHS 441111 CORE 3	P01CA207206	0	19,962
Towards Precision ImmunoOncology: Unraveling the GenomicDeterminants and Mechanisms Underlying Immunotherapy Sensitivity and Resistance	93.395	MSKCC BD524104	1R35CA232097-01	0	17,261
Study Chair-NIH National Clinical Trials Network (NCTN) PCR	93.395	CHOP FP15221 SUB841 01	U01CA180886-04	0	15,000
Psychosocial Approaches to Better Understanding & End Stage Cancer Care (PROTECT)	93.395	CUMC 15050714-02	1R35CA197730-01	0	11,585
Towards Precision ImmunoOncology: Unraveling the GenomicDeterminants and Mechanisms Underlying Immunotherapy Sensitivity and Resistance	93.395	MSKCC BD524104	1R35CA232097-01	0	9,034
Per Case Reimbursement and Patient Studies	93.395	CHOP CU15-2114	UM1CA097452	0	5,998
Support, NIH COG Phase 1 Grant	93.395	CHOP CU15-2115	UM1CA097452	0	4,864
NIH National Clinical Trials Network (NCTN) PCR	93.395	CHPHI 9500080215-12c	1U10CA098543-01	0	1,171
SCIENTIFIC LEADERSHIP: COG NCORP Research Base	93.395	CHPHI 962363-RSUB	1UG1CA189955-01	0	-2,492
				\$0	\$954,774
Cancer Biology Research					
Dectin-1 signaling drives pancreatic oncogenesis by inducing macrophage-medicated adaptive immune suppression (Collaborative Activities to Promote Cancer Cachexia Research (Admin Supp - Clinical Trial	93.396	NYU 18-S1-00-006678	3R01CA215471-01A1S1	0	28,162
				\$0	\$28,162
Cancer Centers Support Grants					
MSK SPORE in Lymphoma-(Project 4: Targeting Acetyltransferase Gene Inactivation in Diffuse Large B Cell Lymphoma)	93.397	MSKCC BD520439B	1P50CA192937-01A1	0	200,895
Towards Understanding Prostate Cancer Heterogeneity	93.397	WCMC 17030366-4	1P50CA211024-01A1	0	133,827
Mechanistic Role of VAV1 alterations in T-cell differentiation and Peripheral T-cell Lymphoma	93.397	MSKCC BD524719	5P50CA192937-03	0	64,802
Investigation of a nonparticle albumin-bound mTOR inhibitor, nabrapamycin, for the intravesical treatment of BCG recurrent or refractory non-muscle invasive transitional cell bladder cancer	93.397	AADI 12-2573	1R42CA171552-01	0	52,833
Human prostate cancer immune phenotypes and master regulators after androgen deprivation therapy.	93.397	CU 183700-12	5P50CA211024-02	0	30,951

Federal Grantor / Pass-through Grantor	CEDA	Drainat Na	Dage through Contract Number	0	R&D Cluster
ederal Grantor / Pass-tillough Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
MSK SPORE in Lymphoma-(Project 4: Targeting Acetyltransferase Gene Inactivation in Diffuse Large B Cell Lymphoma)	93.397	MSKCC BD520439B	1P50CA192937-01A1	0	25,004
Towards Understanding Prostate Cancer Heterogeneity	93.397	WCMC 17030366-4	1P50CA211024-01A1	0	20,359
Repositioning therapeutic principles for Diffuse Large B cell Lymphomas	93.397	MSKCC BD522305	P50CA192937	0	13,332
MSK SPORE in Lymphoma (Career Enhancement Program)	93.397	MSKCC BD520441B	1P50CA192937-01A1	0	9,960
Feasibility of Creating a Prospective Lactation Cohort in the New York Metropolitan Area	93.397	FCCC CU17-2335	P30CA006927	0	9,341
Genetic determinants of primary chemo-resistance in diffuse large B cell lymphoma	93.397	MSKCC BD522275	P50CA192937	0	9,293
MSK SPORE in Lymphoma (Career Enhancement Program)	93.397	MSKCC BD520441B	1P50CA192937-01A1	0	2,040
				\$0	\$572,637
Supporting and Maintaining a Surveillance System for Chronic Kidney Diseas	se (CKD) in t	the United States			
Genomic and Transcriptomic Analysis of Emphysema and Subclinical ILD	93.833	UV GB10323 152721	1R01HL131565-01	0	46,703
				\$0	\$46,703
Cardiovascular Diseases Research					
Atrial fibrillation burden, vascular disease of the brain and cardiac MRI in MESA	93.837	UWASH UWSC8531	1R01HL127659-01	0	329,818
Clinical & Basic Science Studies in Long QT Syndrome Type 3 (LQT3)	93.837	ROCHSTR 416473-G	1R01HL123483-01	0	255,584
Oxidation-mediated structural degeneration of Bioprosthetic Heart Valves	93.837	CHPHI 3201170622	1R01HL143008-01	0	248,783
Chronic Hypertension and Pregnancy-CHAP Clinical Coordinating Center	93.837	UAB 000503570-002	5U01HL120338-02	208,694	240,268
Serotonin Signaling in Mitral Valve Homeostasis, Maintenance and Restoration	93.837	CHPHI FP20409 Sub06 01	5R01HL131872-02	0	229,887
Clinical & Basic Science Studies in Long QT Syndrome Type 3 (LQT3)	93.837	ROCHSTR 416473-G	1R01HL123483-01	0	170,914
Calmodulin Regulation Na Channels: From Function and Structure to Disease	93.837	JH 2003872759	R01HL128743	0	140,493
A Longitudinal Epigenetic Study of Atherosclerosis					

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
nuMoM2b Heart Health Study (nuMoM2b-HHS)	93.837	RTI CU14-3218	1U10HL119991-01	30,656	116,560
Calmodulin regulation of Na+ channels in neurons and cardiomyocytes	93.837	WCMC 17020250	7R01HL122967-03	0	105,830
Assessment of Policies through Prediction of Long-term Effects on Cardiovascular Disease Using Simulation (APPLE CDS)	93.837	NYAMED GT002661 CU	1R01HL14127-01A1	0	95,828
REPRIEVE A5332 and A5333S	93.837	BWH CU15-0282	1U01HL123336-01	0	90,070
Hybrid Coronary Revascularization Trial	93.837	MSH 0255-1521-4609	1U01HL125488-01A1	0	88,877
Pathogenic Role of Selected Cardiac Myocyte- and Fibroblast-Specific Epigenetic Changes in Laminopathies	93.837	UTEXHOUS 0011823B	1R01HL132401-01	0	74,779
Cardiac MR imaging of hemorrhagic reperfusion injury after myocardial infarction	93.837	UPENN 574412	1R01HL137984-01A1	0	73,839
Individual Response to Vitamin D Treatment	93.837	UWASH UWSC9378	2R01HL096875-05A1	0	73,300
Administrative Coordinating Center (ACC) for the NHLBI Cardiovascular Development (CvDC) and Pediatric Cardiac Genomics (PCGC) Consortia	93.837	CINCMC 138281	1U01HL131003-01	0	71,093
Evaluating novel approaches forestimating awake and sleep blood pressure	93.837	UAB 000518835-001	1R01HL139716-01A1	0	70,568
Childhood Adversity and Cardiovascular Health among Puerto Rican Youth	93.837	EMORYU A112942	7R01HL125761-03	0	61,947
Barber-Pharmacist Coordination to Improve Blood Pressure Management in Black Men	93.837	CSMCLA 0001451258	5R01HL117983-05	0	60,000
Pediatric Heart Network U24HL135691	93.837	NERI CU17-3862	U24HL135691	0	58,703
Pediatric Heart Network U24HL135691	93.837	NERI CU17-3862	U24HL135691	0	55,926
CMR Myocardial Tissue Based on Prediction of Ischemic MR Revascularization Response	93.837	CUMC 15040456-04	1R01HL128278-01	0	54,955
Ripple Effect of Lifestyle Intervention During Pregnancy on Partners Weight	93.837	CALPC 15-4-45222	1R01HL118208-01	0	54,403
Reference Profiles of ExRNAs in Normal Human Pregnancy	93.837	UCSD 75649782	5U01HL126494-03	0	47,658
Childhood Adversity and Cardiovascular Health among Puerto Rican Youth	93.837	EMORYU A112942	7R01HL125761-03	0	47,137
Ambulatory blood pressure and falls in older treated patients with hypertension	93.837	KFDNI#OOS030382-CU	1R01HL136445-01A1	0	46,472
Serotonin Signaling in Mitral Valve Homeostasis, Maintenance and Restoration	93.837	CHPHI FP20409 Sub06 01	5R01HL131872-02	0	41,478

For year ended June 30, 2019

,					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Biomechanical Indicators of Bicuspid Aortic Valve Dysfunction	93.837	UTEXAUS CU17-2783	1R01HL142504-01	0	37,890
Eating, Activity, and Weight-Related Problems Across the Life Course in Diverse Populations	93.837	UMINN P06297201	1R35HL139853-01	0	35,495
Clinical Implementation of Clopidogrel Pharmacogenetics: The TAILOR-PCI Trial - CCC - Lead Application	93.837	MAORO COL-215432	1U01HL128606-01A1	0	35,420
TRIAL OF BETA BLOCKER THERAPY(ATENOL) VS ANGIOTENIN II RECEPTOR BLOCKER THERAPY(LOSARTAN) IN INDIVIDUAL WITH MARFAN	93.837	NERI CU01-2786	5 U01 HL68270	0	35,240
National Biological Sample and Data Repository for PAH	93.837	CHMCO 137829	1R24HL105333-01A1	0	34,582
New approaches to cardiothoracic tolerance induction	93.837	MGH 225421	2P01HL018646-36A1	0	33,672
Multi-Component Technology Intervention for African American Emerging Adults With Asthma	93.837	WAYNE WSU17001	1R01HL133506-01	0	32,987
A personalized metabolomics approach to human obesity weight loss	93.837	DUKEU 2036229	5R01HL127009-02	0	32,897
Transitioning from Risk Factors to Heart Failure: Prevalence, Pathogenesis, and Phenomics	93.837	WFUHS 114487	1R01HL127028-01	0	32,413
PREGNANCY AS A WINDOW TO FUTURE CARDIOVASCULAR HEALTH: ADVERSE PREGNANCY OUTCOMES	93.837	RTI 11-312-0214047-52915L	4U10HL119991-04	1,660	30,334
A Highly Sensitive and Targeted Non-Invasive test for the Surveillance of Rejection in Cardiac Transplant Recipients	93.837	MCW 1	1R01HL119747-01	0	30,002
Ezh2-mediated Epigenetic Effects and Alloimmunity	93.837	TEMPLE 257154-03-01	1R01HL127351-01A1	0	29,331
Macrophage Dysfunction in Obesity, Diabetes and Atherosclerosis	93.837	NYUMC 16-A1-00-004888	1P01HL131481-01A1	0	28,959
Statistical Methods for Biosignals with Varying Domains	93.837	JH 2002309393	1R01HL123407-01	0	28,858
Eating, Activity, and Weight-Related Problems Across the Life Course in Diverse Populations	93.837	UMINN P06297201	1R35HL139853-01	0	27,958
Atrial fibrillation burden, vascular disease of the brain and cardiac MRI in MESA	93.837	UWASH UWSC8531	1R01HL127659-01	0	27,311
Incorporation of a Hypertension Working Group into the Jackson Heart Study	93.837	UAB 000515198-002	2R01HL117323-04A1	0	25,988
Prospective trial of oral azithromycin when added to inhaled tobramycin in CF	93.837	SCRI 11657SUB	7R01HL124053-02	0	20,842
Administrative Coordinating Center (ACC) for the NHLBI Cardiovascular Development (CvDC) and Pediatric Cardiac Genomics (PCGC) Consortia	93.837	CINCMC 138281	1U01HL131003-01	0	19,007
Administrative Coordinating Center (ACC) for the NHLBI Cardiovascular Development (CvDC) and Pediatric Cardiac Genomics (PCGC) Consortia	93.837	CINCMC 138281	1U01HL131003-01	0	19,007

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
RLDC: Molecular Pathway-Driven Diagnostics & Therapeutics for Rare Lung Diseases	93.837	CINCMC 135461	1U54HL127672-01	0	18,529
Ezh2-mediated Epigenetic Effects and Alloimmunity	93.837	TEMPLE 257154-03-01	1R01HL127351-01A1	0	18,030
Notch in Angiogenesis and Vascular Biology	93.837	UIL 16880-00	R01HL112626	0	15,061
Telomeres and Female Fecundity	93.837	RUTGER 0070	1R01HL134840-01	0	15,028
Pediatric Heart Network U24HL135691	93.837	NERI CU17-3862	U24HL135691	0	14,770
Childhood Adversity and Cardiovascular Health among Puerto Rican Youth	93.837	EMORYU A112942	7R01HL125761-03	0	14,210
Macrophage-lipoprotein Interactions	93.837	WCMC 17050688	2R01HL093324-08A1	0	12,734
Role of angiogenic Notch in uterine decidualization and placentation	93.837	RUTGER 0780	7R01HL127013-03	0	12,432
Chronic Hypertension and Pregnancy-CHAP Clinical Coordinating Center	93.837	UAB 000503570-002	5U01HL120338-02	0	11,415
Population Effects of Motivation Interviewing on Pediatric Obesity inPrimary Care	93.837	AAP 817102Columbia	R01HL128231-01A1	0	10,619
CTSN:Long-Term Follow-Up for Participants of: Evaluation of Outcomes Following Mitral Valve Repair/Replacement In Severe Chronic Ischemic Mitral Regurgitation (SMR) and Surgical Interventions for Mode	93.837	ISMMS 0255-A341-4605	5U01HL088942-11	0	10,368
RAGE/mDla 1, Macrophage Trafficking and Inflammation In Regression of Diabetic Atherosclerosis	93.837	NYU 16-A1-00-006521-01	1R01HL132516-01A1	0	10,307
RAGE/mDla 1, Macrophage Trafficking and Inflammation In Regression of Diabetic Atherosclerosis	93.837	NYU 16-A1-00-006521-01	1R01HL132516-01A1	0	8,739
Chronic Hypertension and Pregnancy-CHAP Clinical Coordinating Center	93.837	UAB 000503570-002	5U01HL120338-02	0	7,987
INfluenza Vaccine to Effectively Stop Cardio Thoracic Events andDecompensated heart failure (INVESTED)	93.837	BWH PHC #114117	5U01HL130163-02	0	5,774
Randomized, Multicenter, Controlled Trial to Compare Best Endovascular versus Best Surgical Therapy in Patients with Critical Limb Ischemia	93.837	NERI CU15-1318	5U01HL107407-02	0	3,308
TRANSFORM-HF Study	93.837	YU GR104830	7U01HL125511-02	0	3,146
administrative Coordinating Center (ACC) for the NHLBI Cardiovascular Development (CvDC) and Pediatric Cardiac Genomics (PCGC) Consortia	93.837	CINCMC 138281	U01HL131003	0	2,927
Individual Response to Vitamin D Treatment	93.837	UWASH UWSC9378	2R01HL096875-05A1	0	1,795
NHLBI AsthmaNet SIENA	93.837	BWH CU14-2527	5U10HL098102-06	0	1,650

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Pediatric Heart Network U24HL135691	93.837	NERI CU17-3862	U24HL135691	0	1,467
Cardiac Biomarkers in Pediatric Cardiomyopath (per patient)	93.837	WAYNE WSU14112-A3	7R01HL109090	0	675
Transitioning from Risk Factors to Heart Failure: Prevalence, Pathogenesis, and Phenomics	93.837	WFUHS 114487	1R01HL127028-01	0	120
Genotype-Phenotype Associations in Pediatric Cardiomyopathy	93.837	WSU15059-A2	5R01HL111459-05	0	-22
Administrative Coordinating Center (ACC) for the NHLBI Cardiovascular Development (CvDC) and Pediatric Cardiac Genomics (PCGC) Consortia	93.837	CINCMC 138281	1U01HL131003-01	0	-1,230
EHD Proteins in Cardiac Membrane Protein Targeting and Remodeling	93.837	OSU 60038336	1R01HL114383-01A1	0	-2,880
administrative Coordinating Center (ACC) for the NHLBI Cardiovascular Development (CvDC) and Pediatric Cardiac Genomics (PCGC) Consortia	93.837	CINCMC 138281	U01HL131003	0	-4,270
Mucus Microstructure and Osmotic Pressure: Biomarkers for CB in COPD	93.837	JH 2002883011	1R01HL125169-01A1	0	-5,558
Sorafenib for Hepatopulmonary Syndrome	93.837	UPENN 567266	5UM1HL116886-02	0	-8,346
NHLBI AsthmaNet - BARD	93.837	BWH CU14-1907	5U10HL098102-05	0	-25,536
				\$241,010	\$3,886,208
Lung Diseases Research					
SPIROMICS II: Biological underpinnings of COPD heterogeneity and progression	93.838	UCSF CU17-3435	1U01HL137880-01	0	502,580
Pulmonary Vascular Disease Phenomic Program (PVDOMICS)Data Coordinating	93.838	CLEVELCL 743-SUB	5U01HL125177-03	0	64,571
Frailty and patient centered outcomes in candidates for lung transplantation	93.838	UCSF 10296sc	1R01HL134851-01A1	0	56,960
The Road to Destination Therapy: Optimizing Long-Term Mechanical Cardiopulmonary Support forPulmonary Hypertension	93.838	VUMC 67475	1R01HL140231-01A1	0	40,025
SPIROMICS GIC Support	93.838	UNC-CH 5111451	1U24HL141762-01	0	34,328
The CAPTURE Study: Validating a Unique COPD Screening Tool inPrimary Care	93.838	WCMC 16121993-6	1R01HL136682-01	0	31,928
Data Fusion: A Sustainable Scalable, Open Source Registry Advancing PVD Research	93.838	UCOL FY15.369.005	1U01HL121518-01	0	30,814
ORal Bacterial Extracts (ORBEX): Primary Prevention of Asthma and Wheezing in Children	93.838	UA 330411	1U01HL130045-01	0	30,637

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
(1 of 2) Genetic Epidemiology of COPD	93.838	NJMRCCS 20073011	2U01HL089897	0	(Includes Subrecipients) 24,646
ORal Bacterial EXtracts (ORBEX): Primary Prevention of Asthma and Wheezing in Children	93.838	UA 330411	1U01HL130045-01	0	20,607
OPTIMIZing - Treatment for Early Pseudomonas aeruginosa Infection in Cystic Fibrosis: The OPTIMIZE Multicenter, Placebo-Controlled, Randomized Trail	93.838	SCH 11102SUB	1U01HL114623-01A1	0	20,409
SPIROMICS II: Biological underpinnings of COPD heterogeneity and progression	93.838	UCSF CU17-3435	1U01HL137880-01	0	18,954
Development of new drugs for asthma by targeting GABA(A) receptors in the lungs	93.838	UW 153405520	5R01HL118561-02	0	14,963
PATINA - Precision Administration of Treatment in Neutrophilic severe Asthma	93.838	BWH 118345	1UG1HL139124-01	0	10,807
Defining the role of early pulmonary vascular disease in COPD	93.838	UIO W000812667	1R01HL126838-01	0	3,837
SPIROMICS II: Biological underpinnings of COPD heterogeneity and progression	93.838	UCSF CU17-3435	1U01HL137880-01	0	424
ORal Bacterial EXtracts (ORBEX): Primary Prevention of Asthma and Wheezing in Children	93.838	UA 330411	1U01HL130045-01	0	-12
Clinical Risk Factors for Primary Graft Dysfunction	93.838	UPENN 565138	2R01HL087115-06A1	0	-895
				\$0	\$905,583
Blood Diseases and Resources Research					
The Pro-Inflammatory Effects of Acute Exercise in Children with SCA	93.839	CMH 901516-Columbia	1R01HL13680-01	0	53,205
Platelet and megakaryocyte biology in the normal and injured lung	93.839	UCSF 10277sc	R01HL107386	0	38,368
DISPLACE: Dissemination and Implementation of Stroke PreventionLooking at the Care Environment	93.839	MUSC17-072-8C868	1R01HL133896-01A1	0	14,105
MATCH COMMITTEE NIH National Clinical Trials Network (NCTN) Grant (U10CA180886	93.839	CHOP CU17-2416	5U01CA180886-04RVISED	0	7,500
				\$0	\$113,178
Arthritis, Musculoskeletal and Skin Diseases Research					
Engineering Polymers to Scavenge DAMPs in Arthritis and Lupus	93.846	DUKEU A030463	1R01AR073935-01	0	201,824
Treatments Against RA and Effect on FDG PET/Ct: The Target Trial	93.846	BWH 113296	1U01AR068043-01	0	181,386

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
A multiplex assay for early detection of Cutaneous T-Cell Lymphoma	93.846	ALLIS CU17-0320	1R43AR070084-01A1	0	44,664
Evolving Adaptive and Effector Mechanisms from Pre-RA Through Established Disease	93.846	NWU 60044689CU	UH2AR067681	0	39,930
Genetic and Immunologic Etiology of Chronic Recurrent Multifocal Osteomylitis (CRMO)	93.846	UIO 1001838760	5R01AR059703-07	0	24,549
MRI of Proximal Femur Microarchitecture as a Biomarker of Bone Quality	93.846	NYU14-A1-00-001693-01	R01AR066008	0	18,877
MRI of Proximal Femur Microarchitecture as a Biomarker of Bone Quality	93.846	NYU14-A1-00-001693-01	R01AR066008	0	18,877
Complement citrullination in RA pathogenesis	93.846	JHU 2004010096	5R01HL122967-04	0	18,327
Drugs, Germs, and Joints: Antibiotics, Gut Microbiota, and Juvenile Idiopathic Arthritis	93.846	RUTGERS 0252	1K23AR070286-02	0	182
Evolving Adaptive and Effector Mechanisms from Pre-RA Through Established Disease	93.846	NWU 60044689CU	UH2AR067681	0	-16,519
				\$0	\$532,097
Diabetes, Digestive, and Kidney Diseases Extramural Research					
Glycemia Reduction Approaches in Diabetes: A Comparative Effectiveness (GRADE) Study	93.847	GW S-GRD1718-LL7	2U01DK098246-06	0	665,372
Data Coordinating for Type 1 Diabetes TrialNet (UC4)	93.847	USF 6163-1051-00-B	1UC4DK117009-01	0	421,751
siRNA Protection of Composite Islet-Kidney Transplant in Baboons	93.847	MSU RC108392CUNY	7R01DK105468-04	0	332,803
Treatment Options For Type 2 Diabetes In Adolescents and Youth (Today) Trial T2P2	93.847	GWU 16-D06	2U01DK061230-12	0	305,988
siRNA Protection of Islet Grafts in Baboons	93.847	MSU RC108393CUNY	5R01DK105503-05	0	302,827
Glycemia Reduction Approaches in Diabetes: A Comparative Effectiveness (GRADE) Study	93.847	GW S-GRD1718-LL7	2U01DK098246-06	0	227,010
Methylomics of Prenatal GDM: Natural History & Lifestyle Intervention in Children	93.847	LSU 50363-S3	5R01DK100790-02	0	212,940
The Subgingival Microbiome and Impaired Glucose Regulation	93.847	UM P006923603	7R01DK102932-04	0	192,640
Novel pharmacotherapy strategies for obesity in schizophrenia	93.847	UNC-CH 510499	1R01DK105526-01A1	0	180,699
Long-term Consequences of HIV in the Kidney	93.847	BCMH 7000000385	2P01DK056492-01	0	130,970

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Study of coding variants in human obesity and their functional characterization using human iPSC-derived cellular models	93.847	ISMMS 0255-2211-4609	1R01DK110113-01	0	(Includes Subrecipients) 130,15
Pathogenesis of compromised bone quality and mechanics in chronic kidney disease	93.847	IUSM IN46887773CU	1R01DK110871-01	0	125,45
Trialnet Type 1 Diabetes Natural History Study	93.847	UFLRDA 260937	NIDDK	0	114,08
Data Coordinating for Type 1 Diabetes TrialNet (UC4)	93.847	USF 6163-1051-00-B	1UC4DK117009-01	0	99,94
Probing the Biochemical Mechanisms of Amyloid Disease	93.847	SCRIPPS 5-52960	2R01DK046335-25A1	0	71,57
Redefining DM by Agnostic Kidney Interrogation: A Pilot Grant in Confirmation of sn-RNAseq Technology	93.847	GRU 32307-11	U24DK115255-01	0	71,35
siRNA Protection of Islet Grafts in Baboons	93.847	MSU RC108393CUNY	5R01DK105503-05	0	70,866
Epidemiology of Diabetes Interventions and Complications	93.847	CWRU RES511777	3U01DK094157-06S1	0	67,19
Center for Identification and Study of Individuals with Atypical Diabetes Melllitus	93.847	FP068366-01 H	1U54DK118612-01	0	45,024
Purinergic signaling in granulomaforming Th2 immunity	93.847	RUTGER 0363	1R01DK113790-01A1	0	38,07
Continuation of the Glycemia Reduction Approaches in Diabetes: A Comparative Effectiveness (GRADE) Study	93.847	GWU S-GRD1718-LL41	2U01DK098246-06	0	37,129
Epgenetic, Protein, and Cellular Biomarkers of Beta Cell Function in T1D	93.847	YU CU14-0736	1UC4DK104205-01	0	32,84
Dissecting the Pathogenesis and Outcomes of PSC Using Mutiomics by Studying the Exposome and Genome	93.847	COL-245818/PO#66565178	1RC2DK118619-01	0	31,75
Continuation of the Glycemia Reduction Approaches in Diabetes: A Comparative Effectiveness (GRADE) Study	93.847	GWU S-GRD1718-LL41	2U01DK098246-06	0	27,31
Targeting RAGE-MDia1 Signal Transduction in Diabetic Complications: Mechanisms and Therapeutics	93.847	NYUMC 14-A0-00-002489-01	5R24DK103032-03	0	26,68
Epigentic Markers of Severity in Nonalcoholic Fatty Liver Disease	93.847	DISTEFANO-18-04	7R01DK107735	0	18,639
RAGE/mDia 1, Macrophage Trafficking and Inflammation in High Fat Feeding	93.847	NYUMC 15-A0-00-005301-01	1R01DK109675-01	0	15,433
Diabetes Prevention Program Outcomes Study (DPPOS)	93.847	GWU S-DPP1617-JB22	2U01DK048489-23	0	13,14
Targeting RAGE-MDia1 Signal Transduction in Diabetic Complications: Mechanisms and Therapeutics	93.847	NYUMC 14-A0-00-002489-01	5R24DK103032-03	0	11,890
THE NEPHROTIC SYNDROME STUDY NETWORK	93.847	MICHG 3001819806	U54 DK083912	0	10,790

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Diabetes Prevention Program Outcomes Study (DPPOS)	93.847	GWU S-DPP1617-JB22	2U01DK048489-23	0	(Includes Subrecipients) 7,992
Losartan for the Treatment of Pediatirc NAFLD: A Phase 2 Randomized, Placebo-ControlledTrial (STOP-NAFLD).	93.847	JH 2003854718	U01DK061730	0	7,26
Non-Operative Management of Pediatric Appendicitis: A Randomized Controlled Study	93.847	RIH 701-7137304-1	1U34DK112584-01A1	0	6,746
Obesity-Related Epigenetic Changes and Type-2 Diabetes	93.847	WFUHS 114050	R01DK101921	0	3,986
siRNA Protection of Composite Islet-Kidney Transplant in Baboons	93.847	MSU RC108392CUNY	7R01DK105468-04	0	3,948
RAGE/mDia 1, Macrophage Trafficking and Inflammation in High Fat Feeding	93.847	NYUMC 15-A0-00-005301-01	1R01DK109675-01	0	3,306
Multi-level supermarket discounts of fruits and vegetables on intake and health	93.847	ISMMS 0255-1861-4609	1R01DK105440-01A1	0	2,333
Novel Biomarkers to Predict Outcomes in Kidney Transplant Recipients	93.847	YU M17A12649 (A10910)	2R01DK093770-05	0	2,252
REPRIEVE A5332 Kidney Function Sub Study	93.847	BWH 000509533-006	1R01DK108438-01	0	2,238
Subcontract to InfoSciTex Corp: Wearable Artificial Kidney STTR Phase 2	93.847	Vivonics 1483-S001	2R42DK072646-02A1	0	825
The Pathogenesis of HIV Associated Nephropathy	93.847	BCMH 5600650039	5P01DK056492-16	0	-
Epigentic Markers of Severity in Nonalcoholic Fatty Liver Disease	93.847	NJMRCCS 20108201	1R01DK107735-01A1	0	
Predicting Response to Standard Pediatric Colitis Therapy: The PROTECT Study	93.847	CCMC 16-179296-06	5U01DK095745-04	0	-1,237
TrialNet Type 1 Diabetes Natural History Study	93.847	UFLRDA CU09-4618	NIDDK-U01	0	-2,800
TrialNet Type 1 Diabetes Natural History Study	93.847	UFLRDA CU09-4618	NIDDK-U01	0	-4,585
Treatment Options For Type 2 Diabetes In Adolescents and Youth (Today) Trial T2P2	93.847	GWU 16-D06	2U01DK061230-12	0	-8,654
Treatment Options For Type 2 Diabetes In Adolescents and Youth (Today) Trial T2P2	93.847	GWU 16-D06	2U01DK061230-12	0	-12,267
Treatment Options For Type 2 Diabetes In Adolescents and Youth (Today) Trial T2P2	93.847	GWU 16-D06	2U01DK061230-12	0	-16,31
TrialNet Type 1 Diabetes Natural History Study	93.847	UFLRDA CU09-4618	NIDDK-U01	0	-54,616
TrialNet Type 1 Diabetes Natural History Study	93.847	UFLRDA CU09-4618	NIDDK-U01	0	-59,844

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster
<del>-</del>	CFDA	<u>FTOJECT NO</u>	Pass-tillough Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
TrialNet Type 1 Diabetes Natural History Study	93.847	UFLRDA CU09-4618	NIDDK	0	-67,586
NIDDK Type 1 Diabetes TrialNet Data Coordinating Center	93.847	USF 6163-1005-00-B	1UC4DK097835-01	0	-150,910
Glycemic Reduction Approaches in Diabetes (GRADE) Study	93.847	GWU SGRD1213-EA7	5U01DK098246-02	0	-227,40
				\$0	\$3,467,018
Extramural Research Programs in the Neurosciences and Neurological Disc	orders				
Risk Factors FOR Stroke and Cognitive Decline in a Tri-Ethnic Region	93.853	UMIAMI SPC-000876	2R01NS029993-23A1	0	1,020,462
Towards a Complete Description of the Circuitry Underlying SharpWave-Mediated Memory Replay	93.853	SU CU17-0676	1U19NS104590-01	0	555,308
NeuroGrid: A scalable system for large-scale recording of action potentials from the brain surface	93.853	NYU 16-A0-00-006398-01	5U01NS099705-03	0	396,844
High-Speed Volumetric imaging of neural activity throughout the livingbrain	93.853	UCB 00009591	1U01NS103489-01	0	358,89
Targeting Kif11 to Treat Glioblastoma Invasion and Proliferation	93.853	MAOJF COL-232390	7R01NS073610-06	0	340,71:
Project 2 - Neural Basis of Motor Pattern Loops	93.853	CIT 21B-1098370	U19NS104655	73,059	304,866
Close-loop intervention in eplieptogenesis	93.853	SU 61104536-120534	1R01NS094668-01	0	248,247
Wide Deployment of Massively Multiplexed Nanosystems for Brain Activity Mapping	93.853	CALTECH S389576	U01NS099726	0	236,14
Discovery and analysis of the C. elegans neuronal gene expression network (CENGEN)	93.853	YU GR101257 (CON-800013486)	5R01NS100547-02	0	231,339
Consequences of Prolonged Febrile Seizures in Childhood	93.853	AECM 311302	R37NS043209	0	217,44
Functional Mapping of Pathways for Sensory-Motor Integration	93.853	CALTECH 21B-1095811	5U01NS090514-02	0	195,02
PÁTHÓLÓGOMICS: ESSENTIAL TREMÓR IN THE BROADER CONTEXT OF NEURODEGENERATION	93.853	YALE M15A12205 (A10281)	7R01NS088257-02	0	186,97
Mechanisms of Regulation of Progenitor Proliferation and Transformation	93.853	RFCUNY 42012-00-12	7R01NSO52738	0	173,52
Environmental Épidemiology of Essential Tremor	93.853	YU GK000165 (COM-80000475)	1R01NS094607-01	0	159,78
Project 1 - The Neural Basis of Muscle Action Loops	93.853	UWSC10310	U19NS104655	0	157,990

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Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Clinical-Pathological Study of Cognitive Impairment in Essential Tremor	93.853	YU GK000100 (CON-80000453)	R01NS086736	0	(Includes Subrecipients) 132,075
Optimizing flexible, active electrode arrays for chronic, large-scale recording and stimulation on the scale of 100,000 electrodes	93.853	DUKE A03-0340	5U01NS099697-03	0	128,432
High density - cellular resolution multielectrode arrays with spatially selective unidirectional and rotating fields for investigation of neuronal networks	93.853	UMINN N006207501	1U01NS103569-01	0	119,973
CRCNS: Neural Representation of Object Compliance in the Periphery	93.853	UV GB10477.156396	R01NS105241	0	119,640
Androgen Receptors and Sex Differences in the Biological Clock	93.853	ORHSUN 1012987 COLUMBIA	5R01NS102962-02	0	115,942
Modular nanophotonic probes for dense, large-scale neural recording with single-cell resolution	93.853	CALTECH 43B-1095745	U01 NS090596	0	114,010
Long-term outcome in unruptured brain arteriovenous malformation patients	93.853	UCSF 10177sc	1R01NS099268-01A1	0	113,624
Vascular contributions to cognitive impairment and dementia and Stroke in a Bi-racial National Sample	93.853	UAB 000513792-005	2U01NS041588-17	0	108,317
miR regulation of the neurovasculature function in health and disease	93.853	UCI 2018-3616	1R01NS107344-01	0	104,327
SUDEP Translational Research Allicance (SUTRA): The Central Autonomic Network, Serotonin, and Adenosine: SUTRA 4 of 7	93.853	UCL CU14-1548	5U01NS090415-04	0	100,684
Using Cell-Penetrant Peptides to Target ATF5 in Mouse Glioma Models	93.853	UCD 201303503-01	5R01NS083795-02	0	92,212
The Inherited Neuropathy Consortium (INC) RDCRC	93.853	UIO W001054741	5U54NS065712-10	0	89,640
in Vivo Quantification of Cerebellar GABA and NAA in Essential Tremor	93.853	YALE M16A12440 (A10345)	5R01NS085136-04	0	86,206
Risk Factors FOR Stroke and Cognitive Decline in a Tri-Ethnic Region	93.853	UMIAMI SPC-000876	2R01NS029993-23A1	0	83,132
Neurological Emergencies Treatment Trials (NETT)-SHINE	93.853	UMICHG 3002925824-SHN	5U01NS069498-03	0	71,867
Risk Factors FOR Stroke and Cognitive Decline in a Tri-Ethnic Region	93.853	UMIAMI SPC-000876	2R01NS029993-23A1	0	71,358
Modeling enteric nervous system development and Hirschsprung s disease in human pluripotent stem cells	93.853	MSKCC BD520455	1R01NS099270-01	0	69,594
Deep brain photoacoustic tomography at single-neuron resolution using arrays of photonic emitters and high-frequency ultrasound transducers	93.853	CALTECH 67C-1097568/S389076	U01NS099717	0	66,871
The Effect of Lower Pressure over the Life Course on Late-life Cognition in Black	93.853	UMICHG 300465879	1R01NS102715-01	0	60,791
ÉFFECTS OF AFQ056 ON LANGUAGE LÉARNING IN YOUNG CHILDREN WITH FRAGILE X SYNDROME (FXS)	93.853	MGH CU18-1125	U01NS077423	0	58,287

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Circuitry underlying response summation in mouse and primate: theory and experiment	93.853	SALK CU17-3850	1U01NS108683-01	0	(Includes Subrecipients) 55,03
PATHOLOGOMICS: ESSENTIAL TREMOR IN THE BROADER CONTEXT OF NEURODEGENERATION	93.853	YALE M15A12205 (A10281)	7R01NS088257-02	0	47,41
MRI Predictors of Disease and Disability Progression in African Americans With Multiple Sclerosis	93.853	ISMMS 0255-4191-4609	1R01NS10081-01A1	0	44,85
The Frontotemporal Lobar Degeneration Clinical Research Consortium	93.853	UCSF 8570SC	1U54NS092089-01	0	42,95
Carotid Revasculaization and Medical Management for Asymptomatic Carotid Stenosis Trial (CREST-2) Trial (	93.853	MAOJF 187276-01	5U01NS080168-04	0	40,71
Mechanisms of Regulation of Progenitor Proliferation and Transformation	93.853	RFCUNY 42012-00-12	7R01NSO52738	0	40,62
Wide Deployment of Massively Multiplexed Nanosystems for Brain Activity Mapping	93.853	CALTECH S389576	U01NS099726	0	39,61
Lab-to-Marketplace: Commercialization of a stretchable microelectrode array	93.853	BEEDINC 2R44NS086118-03A1-C	U 5R44NS086118-04	0	36,63
Engineering stem cell therapies to understand and overcome glioblastoma adaption	93.853	UNC-CH 5109024	5R01NS099368-03	0	36,00
Consequences of Prolonged Febrile Seizures in Childhood	93.853	AECM 311302	R37NS043209	0	33,66
Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs (MONEAD) II	93.853	SU 61865504-125439	2U01NS038455-16A1	0	32,80
Discovery Healthcare Innovations to Address Disparities in Stroke (DIADS)	93.853	UCSF 8621sc	1U54NS081760-01	0	30,75
Optimizing flexible, active electrode arrays for chronic, large-scale recording and stimulation on the scale of 100,000 electrodes	93.853	DUKE A03-0340	5U01NS099697-03	0	30,17
The Frontotemporal Lobar Degeneration Clinical Research Consortium	93.853	UCSF 8570SC	1U54NS092089-01	0	24,61
Neurological Emergencies Treatment Trials (NETT)-Point	93.853	UMICHG 3002925634-PNT	5U01NS062835-04	0	23,34
Discovery and analysis of the C. elegans neuronal gene expression network (CENGEN)	93.853	YU GR101257 (CON-800013486)	5R01NS100547-02	0	21,15
ICH Recovery Grant	93.853	UCINCI 011078-007	5R01NS100417-02	0	19,48
Long-term outcome in unruptured brain arteriovenous malformation patients	93.853	UCSF 10177sc	1R01NS099268-01A1	0	18,93
Project 1 - The Neural Basis of Muscle Action Loops	93.853	UWSC10310	U19NS104655	0	18,51:
Center for Stroke Disaparities Solution, Project III	93.853	NYU 12-02247 101974-108621	1U54NS081765-01	0	18,12

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Federal Grantor / Pass-through Grantor	CEDA	Drainet No.	Door through Contract Number	Out as sinis at	R&D Cluster
<del></del>	CFDA	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Project 2 - Neural Basis of Motor Pattern Loops	93.853	CIT 21B-1098370	U19NS104655	9,695	18,079
NSTN National Clinical Coordinating Center Administrative Agreement	93.853	UCINCI 011414-Adm-Marshall	2U01NS086872-06	0	17,388
Mapping representational format across the human brain	93.853	BROWNU 00001239	1R21NS108380-01	0	16,244
ÉnDovascular ThErapy Following Imaging EvalUation for ISchemic StrokE 3	93.853	UCINN 010085-135721	1U01NS092076-01A1	0	13,582
Vascular contributions to cognitive impairment and dementia and Stroke in a Bi-racial National Sample	93.853	UAB 000513792-005	2U01NS041588-17	0	12,799
Center for SUDEP Research (CSR): Autonomic and Imaging Biomarkers of SUDEP	93.853	CWRU RES513483	5R01NS090407-01	0	11,060
SUDEP Translational Research Allicance (SUTRA): The Central Autonomic Network, Serotonin, and Adenosine: SUTRA 4 of 7	93.853	UCL CU14-1548	5U01NS090415-04	0	9,892
Center for Stroke Disparities Solution (Core A)	93.853	NYU 12-02247 101975	1U54NS081765-01	0	9,620
The Frontotemporal Lobar Degeneration Clinical Research Consortium	93.853	UCSF 8570SC	1U54NS092089-01	0	8,677
A model system for studying the interaction of multiple processes for motor learning	93.853	PU CU13-0458	1R01NS084948-01	0	6,020
Clinical Coordination Center for STEADY-PD3	93.853	NWU 60036745 CU	1U01NS080818-01A1	0	5,641
An Exploratory Phase II STudy to Determine the Tolerability, Safety, and Activity of a Novel Vasopressin 1a Receptor Antagonist (SRX246) in Irritable Subjects with Huntington s Disease (HD) (NN105) -	93.853	UMASS CU16-1638	1U10NS077423-01	0	5,465
Safety & Efficacy of Intgramyocardial Injection of Messenchymal Precursor Cells on Myocardial Function In LVAD Recipients	93.853	ISMMS 0255-A341-4605	5U01HL088942-08	0	5,376
Maternal Outcomes and Neurodevelopmental Effects of Antiepileptic Drugs	93.853	EMORYU T659982	2U01NS038455-11A1	0	5,275
Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial - Hemodynamics (CREST-H)	93.853	MAOJF COL-232483	1R01NS097876-01A1	0	4,339
NIH Stroke Net National Coordinating Center - Administrative Collaborating Agreement	93.853	UCIN 008822	1U01NS086872-01	0	3,838
Mechanisms of Early Recurrence in Intracranial Atherosclerotic Disease	93.853	UM SPC-000140	1R01NS084288-01A1	0	3,460
Approaches and Decisions for Acute Pediatric TBI (ADAPT).	93.853	UPITT 0030451	1U01NS081041-01A1	0	3,000
The Inherited Neuropathy Consortium (INC) RDCRC	93.853	UIO W001054741	5U54NS065712-10	0	2,922
Center for SUDEP Research (CSR): Autonomic and Imaging Biomarkers of SUDEP	93.853	CWRU RES513483	5R01NS090407-01	0	2,593

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Towards a Complete Description of the Circuitry Underlying SharpWave-Mediated Memory Replay	93.853	SU CU17-0676	1U19NS104590-01	0	(Includes Subrecipients) 1,595
Topiramate as a Disease Altering Therapy for Cryptogenic Sensory Peripheral Neuropathy (CSPN) (NN108) Study	93.853	MGH CU18-2043	1U01NS095388-01A1	0	1,384
IDENTIFYING GÉNÉS AND PATHWAYS THAT IMPACT TAU TOXICITY IN FTD	93.853	COL-219212	3U54NS100693-02S1	0	1,362
Established Status Epilepticus Treatment Trial (ESSETT)	93.853	UV GB10094-14858/151272	1U01NS088031-01	0	1,074
Neurological Emergencies Treatment Trials (NETT)- ESETT	93.853	SUBK00004095-ESETT	5U01NS088034-04	0	883
Established Status Epilepticus Treatment Trial (ESSETT)	93.853	UV GB10094-14858/151272	1U01NS088031-01	0	221
High-speed volumetric imaging of neuronal network activity at depth using Multiplexed Scanned Temporal Focusing (MuST)	93.853	RFU 1U01NS094263-02	1U01NS094263-01	0	3
The Effect of Lower Pressure over the Life Course on Late-life Cognition in Black	93.853	UMICHG 300465879	1R01NS102715-01	0	-1
PlexinB2 function in glioma invasion and glioma stem cell maintenance	93.853	ISMMS 0255-0821-4609	1R01NS092735-01A1	0	-4
Molecular Motors and Glioma Dispersion	93.853	CCLC 615-SUB	5R01NS073610-03	0	-4
Modeling enteric nervous system development and Hirschsprung s disease in human pluripotent stem cells	93.853	MSKCC BD520455	1R01NS099270-01	0	-12
Safety Evaluation Of 3K3AAPC in Ischemic Stroke-Rhapsody-NEURONEXT	93.853	CSMCLA CU15-3417	5U01NS088312-02	0	-349
Wide Deployment of Massively Multiplexed Nanosystems for Brain Activity Mapping	93.853	CALTECH S389576	U01NS099726	0	-709
Risk Factors FOR Stroke and Cognitive Decline in a Tri-Ethnic Region	93.853	UMIAMI SPC-000876	2R01NS029993-23A1	0	-822
Futility Study of Deferoxamine Mesylate in Intracerebral Hemorrhage (i-DEF)	93.853	BIDMC CU15-0742	5U01NS074425-03	0	-3,749
Neurological Emergencies Treatment Trials	93.853	UMICHG 3004674689-PNT	2U01NS06286-06	0	-12,340
				\$82,754	\$7,499,770
Allergy and Infectious Diseases Research					
INNER CITY ASTHMA CONSORTIUM (ICAC3): CORE	93.855	UWIS 839K193	1UM1AI114271-01	0	988,671
HPTN 083 Protocol Funding - Development Cost	93.855	FHID PO16002898	5UM1Al068619	903,842	915,435

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<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
HVTN 703/ HPTN 081 Site Readiness	93.855	FHCRC 0000888693	5UM1AI068614-09	0	448,254
HPTN 085 - Harlem Prevention Center CRS	93.855	FHID PO15004260	UM1Al068619	28,794	394,182
HPTN 085 - Bronx Prevention Center CRS	93.855	FHID PO15004262	UM1Al068619	0	389,701
HPTN 084: A Phase 3 Double Blind Safety and Efficacy Study of Long-Acting Injectable Cabotegravir Compared to Daily Oral TDF/FTC for Pre- Exposure Prophylaxis in HIVUninfected Women	93.855	FHI360 PO18001958	UM1AI068619	245,477	387,059
HPTN083 Protocol Funding - Implementation Costs Bronx CRS	93.855	FHID PO17002294	5UM1Al068619-11	0	374,095
HPTN083 Protocol Funding - Implementation Costs Harlem CRS	93.855	PO17001995	5 UM1Al068619-11	28,794	288,671
HVTN Protocol Funding	93.855	FHCRC 0000966184	2UMAI068614-08	0	206,326
HPTN 081/085 Protocol Funding - Implementation - Centralized Laboratory and Other Operational Support	93.855	FHID PO16003322	UM1 AIO68619	0	205,484
Delivery of Rectal Énema as Microbicide	93.855	JHU 2002342875	1U19AI113127-01	0	203,907
HPTN 084, A Phase 3 Double Blind Safety and Efficacy Study of Long Acting Injectable Cabotegravir Compared to Daily Oral TDF/FTC for Pre- Exposure Prophylaxis in HIV Uninfected Women.	93.855	FHI PO17003034	UM1Al068619	27,577	185,572
Miami Womens Interagency HIV Study (WIHS)	93.855	UMIAMI SPC-000610	1U01AI103397-01	0	163,351
School Inner-City Asthma Intervention Study	93.855	CHB GENFD0001578885	5U01AI110397-02	0	159,773
AIDS Clinical Trials Group Protocol Funds	93.855	BWH CU14-1723	2UM1Al068636-08	0	156,314
HVTN Protocol Funding	93.855	FHCRC 0000966184	2UMAI068614-08	0	135,716
Units for HIV/AIDS Clinical Trials Network	93.855	CAPRISA1 2002 024027 08	2UM1Al069469-08	0	121,554
Units for HIV/AIDS Clinical Trials Network	93.855	CAPRISA1 2002 024027 08	2UM1Al069469-08	0	121,060
High-dimensional phenotypic and functional characterization of human NK cells from lymphoid and non-lymphoid sites	93.855	ISMMS 0255-8673-4609	5U19AI118610-04	0	119,198
Inhibitors of Purine Import into Plasmodium falciparum Kill Malaria Parasites	93.855	AECM 310838	1R01Al116665-01	0	113,887
Míami Womens Interagency HIV Study (WIHS)	93.855	UMIAMI SPC-000610	1U01AI103397-01	0	105,268
INNER CITY ASTHMA CONSORTIUM (ICAC3): CORE	93.855	UWIS 839K193	1UM1Al114271-01	0	101,622

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
HIV s Effects on Breast Cancer Treatment and Outcomes in South Africa	93.855	WHCL D1404280	1R01CA192627-01	0	(Includes Subrecipients) 97,649
The Fetal and Childhood Environment, Oxidative Balance, Inflammation and Asthma	93.855	TBWHI 114196	4R01Al102960-04	0	95,342
Optimizing clinical use of Polymyxin B: Teaching old drug to treat superbugs	93.855	UMICHG 3004415914	7R01Al1119446-03	0	88,234
Function of antimalarial drug resistance proteins	93.855	GU 411310	2R01Al056312-10A1	0	85,388
HPTN 085 - Bronx Prevention Center CRS	93.855	FHID PO15004262	UM1AI068619	0	85,103
Generation of Anti-Donor CAR Tregs to Enhance Mixed Chimerism and Tolerance to Deceased Donor Kidney Transplants	93.855	UWM CU18-2952	2U01Al102456-06	0	83,040
Point-of-care assay for serodiagnosis of Leptospirosis	93.855	ITI CU18-1165	5R43Al136551-02	0	80,743
HVTN Protocol Funding	93.855	FHCRC 0000966184	2UMAI068614-08	0	79,44
Novel Reporter Phages to Detect Complex TB Drug Resistance and Persistence	93.855	AECM 310877	5R01Al114900-03	0	78,857
HPTN 085 - Harlem Prevention Center CRS	93.855	FHID PO15004260	UM1AI068619	0	76,742
DNA Elements Underlying Celiac and Crohn's Susceptibility	93.855	HUMC 2018-133140-CU	7R21Al133140	0	75,589
HVTN 703/HPTN 081 Site Readiness	93.855	FHCRC 0000888693	5UM1AI068614-09	0	74,716
HPTN 084: A Phase 3 Double Blind Safety and Efficacy Study of Long-Acting Injectable Cabotegravir Compared to Daily Oral TDF/FTC for Pre- Exposure Prophylaxis in HIVUninfected Women	93.855	FHI360 PO18001958	UM1AI068619	0	68,948
Dengue Human Immunology Project Consortium (DHIPC)	93.855	ISMM 0255-8689-4609	5U19Al118610-03	0	67,158
HIV/AIDS Prevention Trials Network (HPTN) Leadership Group	93.855	FHI 860/0080.0015	UM1AI068619	0	66,327
HVTN Scientific Leadership (Hammer)	93.855	FHCRC 0000791118	2UM1Al068614-08	0	65,203
Inhibitors of Purine Import into Plasmodium falciparum Kill Malaria Parasites	93.855	AECM 310838	1R01Al116665-01	0	57,208
East Africa international Epidemiologic Database to Evaluate AIDS (leDEA) Regional Consortium	93.855	IN4688916COL	2U01Ai09629911-11	0	53,198
Identification and validation of molecular markers of piperaquine resistance	93.855	UMB 1701550	1R01Al25579-02	0	52,456
Women's Interagency HIV Study (WIHS)-Longitudinal Cohort	93.855	EMORYU T930529	5U01Al103408-03	0	47,995

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<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
HVTN Scientific Leadership (Hammer)	93.855	FHCRC 0000791118	2UM1AI068614-08	0	45,693
Antigen-independent antibody diversification in GALT of young children	93.855	LOYAU 1-210155	1R21Al140254-01	0	43,817
Heme utilization by Mycobacterium tuberculosis	93.855	UAB 000521324-001	1R01Al137338-01A1	0	43,471
HVTN Scientific Leadership (Sobieszcayk)	93.855	FHCRC 0000851189	5UMAI068614-09	0	42,875
The molecular basis of the carbapenem resistance epidemic	93.855	RU 8315	2R01AI090155-07A1	0	42,398
A Pilot Study Evaluating the Use of Novel Self-Administered Dried Blood Spot Device - HemaSpot - to Monitor PrEP Use among Men Who Have Sex with Men	93.855	FHCRC 0000887934	5UM1Al068614-10	0	40,955
Rhinovirus respiratory infection and sphingolipid metabolism	93.855	CUMC 182171	1R21AI140724-01	0	40,500
Central Africa International Epidemiology Database to Evaluate AIDS (CA-leDEA)	93.855	AECM 31614H	2U01Al096299-07	0	39,517
IL-33 Blockade as a Novel Therapeutic for T-cell Mediatiated Hypercytokinemia Syndromes	93.855	CHPHI 3200280521	1R01Al121250-01A1	0	38,800
International Maternal Pediatric Adolescent AIDS Clinical Trials Group (IMPAACT)	93.855	JH 2002127548	UM1AI068632	0	38,738
Monochromatic 222 nm UV light: Development of safe, cost-effective technology for the efficient reduction of bacterial and viral infection and transmission	93.855	EPINIHSUB19-01	2R42AI125006-2A1	0	37,562
HPTN Leadership and Operations Center	93.855	FHI FCO 104112/ID 0080.0239	UM1AI068619	0	35,139
International Maternal Pediatric Adolescent AIDS Clinical Trials Group (IMPAACT)	93.855	JH 2002127548	UM1AI068632	0	31,145
Parasite-specific proteasome inhibitors to combat mult-drug resistant malaria	93.855	SU 61424825-123798	1R21AI127581-01	0	29,652
Parasite-specific proteasome inhibitors to combat mult-drug resistant malaria	93.855	SU 61424825-123798	1R21AI127581-01	0	27,852
Listeria monocytogenes physiology and host pathogen interactions	93.855	UWASH UWSC8286	5R01AI116669-05	0	25,410
Exploring HIV Risk Within the Context of Gend	93.855	FHID PO17002027	UM1AI068619	0	23,940
Sofosbuvir and Ledipasvir in HIV/HCV Coinfected Pre & Post Liver Transplant	93.855	UCSF 8658sc	1U01Al115714-01	0	22,612
Safety, phamacokinetics, and resistace to bedaquiline in XDR TB and HIV	93.855	AECM 14-2397	1R01Al114304-01A1	0	22,491
ACTG Protocol Funding - Core Funding	93.855	UCLA CU18-2702	7UM1Al068636-13	0	20,715

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Strategies for Tuberculosis Control in Prisons	93.855	SU 61485127-124916	1R01Al13005801	0	20,172
Mechanisms of polarization of monocytes by DAMPs/PAMPs and C1q	93.855	FIMR 500784CU	1R01Al135063-01A1	0	19,492
Defining the targets of broad intervention antimalarial agents	93.855	UCSD 42374631	4R01Al103058-04	0	19,273
East Africa international Epidemiologic Database to Evaluate AIDS (IeDEA) Regional Consortium	93.855	IN4688916COL	2U01Al09629911-11	0	17,398
HIV Prevention Trials Network: Protocol Leadership: HPTN078	93.855	FHI PO15000459	UM1AI068619	0	17,086
The Role of Casual Contact and Migration in XDR TB Transmission in South Africa: a Geospatial, Genomic and Social Network study	93.855	EU T937299	1R01Al138646-01	0	14,555
Autoimmunity Center of Excellence Clinical Research Program	93.855	UCSF 9882SC	5UM1Al110498-03	0	14,384
HIV Prevention Trials Network: Protocol Leadership: HPTN078	93.855	FHI PO15000459	UM1Al068619	0	13,536
Novel Hantavirus Virulence Determinants	93.855	SUNYSB 75939	R56Al119854	0	13,446
School Inner-City Asthma Intervention Study	93.855	CHB GENFD0001578885	5U01Al110397-02	0	13,207
Hope in Action: A Clinical Trial of HIV-to-HIV Deceases Donor Kidney Transplantation	93.855	JHU 2003649381	1U01Al134591-01	0	12,382
LEADERSHIP AND OPERATIONS CENTER (LOC), AIDS CLINICAL TRIALS GROUP (ACTG) LOC 1/	93.855	BWH 117360	5UM1AI068636-12	0	12,321
Immune Tolerance Network	93.855	BRI FY16ITN109	5UM1AI109565-02	0	12,094
Chronic Graft Destruction: Interplay of Allo- and Autoantibodies and Nonadherence	93.855	VUMC40877	6U01Al104336-05	0	11,276
AIDS Clinical Trials Group Protocol Funds	93.855	BWH CU14-1723	2UM1Al068636-08	0	11,256
Safety, phamacokinetics, and resistace to bedaquiline in XDR TB and HIV	93.855	AECM 14-2397	1R01Al1114304-01A1	0	11,077
HIV/AIDS Prevention Trials Network (HPTN) Leadership Group	93.855	FHI 860/0080.0015	UM1Al068619	0	10,001
Immune Tolerance Network	93.855	FY15ITN159	5UM1AI109565-02	0	9,001
Creation of Generalizable ED-based Antimicrobial Stewardship ProgramUsing Electronic Health Record Clinical Decision Support	93.855	UCOL FY18.777.004	1R21Al139839-01	0	7,672
Rituximab Plus Cyclophosphamide Followed by Belimimab for the Treatment of Lupus Nephritis	93.855	BRI FY15ITN152	5UM1Al109565-02	0	6,931

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
INNER CITY ASTHMA CONSORTIUM (ICAC3): CORE	93.855	UWIS 839K193	1UM1Al1114271-01	0	(Includes Subrecipients) 6,820
Immunosupression Withdrawl for Stable Pediatric Liver Transplant Recipients	93.855	UCSF 7230sc	5U01Al100807-03	0	5,363
HPTN 084, A Phase 3 Double Blind Safety and Efficacy Study of Long Acting Injectable Cabotegravir Compared to Daily Oral TDF/FTC for Pre- Exposure Prophylaxis in HIV Uninfected Women.	93.855	FHI PO17003034	UM1AI068619	0	5,064
Targeting Inflammation and Alloimmunity in Heart Transplant Recipients with Tocilizumab , ( Study )	93.855	MGH 232560	1U01Al136816-01	0	4,382
Rhinovirus respiratory infection and sphingolipid metabolism	93.855	CUMC 182171	1R21Al140724-01	0	4,186
HVTN Protocol Funding	93.855	FHCRC 0000966184	2UMAI068614-08	0	3,937
Delivery of Rectal Énema as Microbicide	93.855	JHU 2002342875	1U19AI113127-01	0	3,713
Rituximab for Treatment of SSc-PAH (ASC01)	93.855	UCSF 9309SC	5UM1Al110498-02	0	2,750
Immunosupression Withdrawl for Stable Pediatric Liver Transplant Recipients	93.855	UCSF 7230sc	5U01Al100807-03	0	2,726
Immune Tolerance Network	93.855	FY15ITN159	5UM1Al109565-02	0	2,162
HVTN 703/ HPTN 081 Site Readiness	93.855	FHCRC 0000888693	5UM1AI068614-09	0	560
Targeting matrix metalloproteinases to limit imunopathology in airborne infection	93.855	USH 2	5R33Al102239-04	0	104
ÚNITS FÓR HIV/AIDS CLÍNICAL TRIÁLS NÉTWORK	93.855	*UZZN CU52152001	1 U01 Al069469-01	0	-1
B-Cell Targeted Induction to Improve Outcomes in Pediatric Lung Transplantation	93.855	WASHU WU-15-206	5U01Al077810-07	0	-89
East Africa international Epidemiologic Database to Evaluate AIDS (leDEA) Regional Consortium	93.855	IN4688916COL	2U01Al09629911-11	0	-9,941
HVTN Correlates Phase 1 Funding (PF) (HVTN 108 and HVTN 120)	93.855	FHCR 0000938671	5UM1AI068614-12	0	-48,493
				\$1,234,484	\$8,707,523
Microbiology and Infectious Diseases Research					
The Role of RHOA in Diffuse Gastric Cancer	93.856	DFCI 1203001	1R01CA224428-01	0	173,768
••••••				\$0	\$173,768

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Biomedical Research and Research Training					
A minimally invasive synthetic biology-driven approach for natural products discovery	93.859	RFU CU14-2989	U01GM110714-01A1	0	382,783
Structure-Based Antagonism of HIV1 Envelope Function in Cell Entry	93.859	DREXEL 800132-Columbia	2P01GM056550-22	0	280,745
Engineered gene circuits for basic science and biotechnology	93.859	UCSD 82360876	5R01GM069811-14	0	143,963
Center on Macromolecular Dynamics by NMR Spectroscopy	93.859	NYSBC G09112-01	5P41GM118302-02	0	143,903
FEBio- Finite Elements for Biomechanics and Biophy	93.859	UUTAH 10026950-COLUMBIA	5R01GM083925-08	0	142,046
Semiparametric analysis of censored data in current medical studies	93.859	UNC-CH-5101930	5R01GM047845-27	0	125,899
Efficient Statistical Learning Methods for Personalized Medicine Using Large Scale Biomedical Data.	93.859	UNC-CH 5110020	1R01GM124104-01A1	0	95,321
Catalytic Platforms Using Aromatic Ions and Other Charged Species	93.859	CU 86380-11176	1R35GM127135-01	0	84,361
A minimally invasive synthetic biology-driven approach for natural products discovery	93.859	RFU CU14-2989	U01GM110714-01A1	0	69,414
Kyaterekera Project: A Combination Intervention Addressing Sexual Risk-Taking Behaviors Among Vulnerable Women in Uganda	93.859	WASHU CU18-0191	NIH CU18-0191	0	64,195
New Methods for the Synthesis of Biologically Active Peroxides	93.859	NYU F0501-01	5R01GM118730-02	0	53,636
Regulatory modifiers of coding variant penetrance	93.859	NYGC R01GM122924-COL-1	1R01GM122924-01	0	52,572
The Transport Cycle in Neurotransmitter Uptake Systems (Bridge 3.1)	93.859	UCHIC FP043359-B	2U54GM087519-06	0	41,786
Structure-Based Antagonism of HIV-1 Envelope Function in Cell Entry	93.859	DREXEL 800128-Columbia	5P01GM056550-19	0	36,324
Next Generation Fluorescent Probes for Biological	93.859	CORNELL 180847	2R01GM098859-05	0	29,286
Methods for integrated analysis of multi-level omics data	93.859	MHC GD9311	1R01GM127862-01	0	29,238
Statistical methods for modeling multi-omic data	93.859	MHC GD9241	1R15GM126485-01	0	28,962
Spatial Models of Cell Regulatory Networks	93.859	ISMMS 0225-0651-4609	5R01GM072853-12	0	23,832

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Spatial Models of Cell Regulatory Networks	93.859	ISMMS 0225-0651-4609	5R01GM072853-12	0	17,803
UNDERSTANDING THE BIOLOGICAL FUNCTION OF MCM10	93.859	UMINN N005495702	R01GM074917	0	17,661
The mechanism through which mRNA translation enhancer elements drive cap-independent translation	93.859	RFCUNY CM00002680-00	1R01GM128239-01A1	0	16,341
Modulation of KCNQ1 Channel Activity	93.859	UMIAMI CU13-1303	1R01GM109762-01	0	12,091
Statistical Methods for Single-Cell Transcriptomics	93.859	UPENN 572782	1R01GM125301-01	0	2,077
				\$0	\$1,894,239
Child Health and Human Development Extramural Research					
The Maternal Fetal Medicine Unit Network	93.865	GWU CU14-1338	2U10HD036801-16	585,022	1,040,973
Gene Mutation and Rescue in Diaphragmatic Hernia	93.865	MGH 230914	P01HD068250	0	231,998
Predictive Informatics Monitoring in the Neonatal Intensive Care Unit	93.865	UV GB10607-159537	2R01HD072071-04A1	0	165,792
Novel retinoic acid receptor alphaselective antagonistsProject 1	93.865	UMINN P006822801	1U54HD093540-01	0	158,947
Inhibitors of Purine Import into Plasmodium falciparum Kill Malaria Parasites	93.865	AECM 310838	1R01Al116665-01	0	130,944
Data Integration and Advanced Statistical Modeling to Describe and Control Pediatric Pedestrian Injuries in The United States	93.865	15-A0-00-004772-01	5R01HD087460-02	0	123,867
Developmental Mechanisms of Trachea-Esophageal Birth Defects,project 1	93.865	CHMCO 140554	1P01HD093363-01	0	120,273
PSDP Fellowship	93.865	CHMC 139469	5K12HD000850-34	0	120,184
Mechanisms by which steroid hormones modulate cervical extracellular matrix structure and function during pregnancy and provide therapeutic protection against preterm birth	93.865	UTSW GMO 170904	5R01HD088481-03	0	101,406
Protection Against Cognitive Decline in MS: Longitudinal Investigation of Reserve	93.865	MSSM 0255-1471-4609	R01HD082176	0	88,437
A multi-modality, multi-scale approach to understanding parturition	93.865	UWIS 865K196	2R01HD072077-06	0	72,663
Clinical Diagnostic Sequencing of Structural Variation	93.865	MGH 225991	1R01HD081256-01A1	0	70,203
A multi-modality, multi-scale approach to understanding parturition	93.865	UWIS 865K196	2R01HD072077-06	0	69,706

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Developmental Mechanisms of Trachea-Esophageal Birth Defects	93.865	CHMC 140553	1P01HD093363-01	0	61,027
Contraceptive Discovery, Development and Behavioral Research Center - Project # 2	93.865	UMINN P006247401	1U54HD093540-01	0	57,630
Novel retinoic acid receptor alphaselective antagonistsProject 1	93.865	UMINN P006822801	1U54HD093540-01	0	57,041
RNA Biosignatures: A Paradigm Change for the Management of Young Febrile Infants	93.865	UMICH 3004685884	7R01HD085233-03	0	55,384
A randomized controlled trial of pravastatin to prevent preeclampsia in high-risk women	93.865	UTMD 19-84509-01	1R01HD07549-01	0	51,341
Socioeconomic Disparities in Cognitive & Neural Development in the First 3 Years	93.865	TC 512158-01	1R01HD093707-01	0	49,726
Impact of Perinatal Depression treatment on child developmental outcomes	93.865	UNC 5105594	7R01HD075875-04	0	46,930
Molecular mechanisms of infection-mediated cervical ripening	93.865	UTSW GMO 160410	5R01HD086495-04	0	37,424
Improving Outcomes for HIV-infected Children in South Africa and Cote divoire	93.865	MGH 224642	1R01HD079214-01	0	31,629
Place matters - Adaptable Solutions to Violence at the Community Level	93.865	TUL-HSC-556530-18/19	1R01HD095609-01	0	30,679
Parenting and Men's Health: The Utility of the fathers and Sons Program	93.865	UMICHG 3004148036	5R01HD084526-02	0	30,339
Innovative PK/PD Approaches to Optimize TBM Treatment in Children (PATCH Study)	93.865	JHU 2002824937	R01HD074944-02	0	28,629
Medical Optimization & Management of Pregnancies with Overt Type 2 Diabetes (MOMPOD)	93.865	UNC 5106225	1R01HD086139-01A1	0	25,587
Contraceptive Discovery, Development and Behavioral Research Center - Project # 3	93.865	UMINN P006247402	1U54HB093540-01	0	24,145
Delivery mode, environment and the gut microbiome: influence on childhood body size	93.865	HFHS 87645	1R01HD082147-01A1	0	21,035
Sexual-Minority Health	93.865	UUTAH 2C10048964	1R01HD0914505-01	0	19,748
Impact of Combined Use of Depot Medroxyprogesterone Acetate Contraception and Tenofovir PreExposure Prophylaxis on Bone Health (Depo-PrEP)	93.865	UWSC9850	1R01HD089843-01A1	0	19,435
WeCare	93.865	AAP CU18-0762	1R01HD090191-01	0	18,967
FANMI: A community-based cohort model for HIV adolescent care in Haiti	93.865	17071036-01	1R01HD091935-01A1	0	16,890
Protection Against Cognitive Decline in MS: Longitudinal Investigation of Reserve	93.865	MSSM 0255-1471-4609	R01HD082176	0	15,624

For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
The Pediatric HIV/AIDS Cohort Study (PHACS)	93.865	TUL-HSC-556627-19/20	5U01HD052104-14	0	14,721
FANMI: A community-based cohort model for HIV adolescent care in Haiti	93.865	17071036-01	1R01HD091935-01A1	0	14,664
Using Smart Phones to Understand the Link between Social and Geographical Context and HIV Risk Behavior Among MSM	93.865	YU GR101489 (CON-80001024	1R01HD092185-01	0	14,587
The Vuka Family Program: Supporting the health and behavior of South African HIV+ youth	93.865	NYU F7107-01	1R01HD074052-01	0	14,151
Fragile Families and Child Well-being in Adolescence	93.865	PU 00002107	2R01HD036916-11A1	0	13,763
Contraceptive Discovery, Development and Behavioral Research Center - Project # 2	93.865	UMINN P006247401	1U54HD093540-01	0	12,743
Burden and Reducing Risk of Neurological, Cognitive and Behavioral Impairment of Pediatric Sickle Cell Disease in Uganda	93.865	MU MakCHS092016	1R21HD089791-01	0	9,527
Contraceptive Discovery, Development and Behavioral Research Center - Project # 3	93.865	UMINN P006247402	1U54HB093540-01	0	8,013
VentFirst: A multicenter RCT of assisted ventilation during delayed cord clamping for extremely preterm infants	93.865	GB10318 159922	5R01HD087413-02	0	7,998
The Pediatric HIV/AIDS Cohort Study (PHACS)	93.865	TUL-HSC-556627-19/20	5U01HD052104-14	0	2,654
Control of the Neonatal Septisome and Hydrocephalus in sub Saharan Africa	93.865	COLHD086071	5DP1HD086071-02	0	-309
Control of the Neonatal Septisome and Hydrocephalus in sub Saharan Africa	93.865	COLHD086071	5DP1HD086071-02	0	-605
Impact of Emergency Department Probiotic Treatment of Pediatric Gastoenteritis	93.865	WUSOM WU-14-226-MOD-3	1R01HD071915-01A1	0	-906
Anesthesia Toxicity in Neonatal Primate Brain	93.865	WASHU WU-17-229	4R01HD052664-10	0	-1,820
Nutritional Primary Prevention of Type 1 Diabetes	93.865	UPITT #0019592(125895-1)	5U01HD042444-14	0	-80,830
				\$585,022	\$3,222,954
Aging Research					
Alzheimer s Disease Genetics Consortium	93.866	UPENN 573992	5U01AG032988	0	408,108
Genetic Epidemiology of Early-Onset Alzheimer's disease in Caribbean Hispanics and non Hispanic Whit	93.866	UMIAMI SPC-000135	1RF1AG054080-01	0	383,520
Risk Factors, Pathology and Clinical Expressions of AD	93.866	RUSH L97092581-Sub04	2RF1AG015819-16	0	349,330

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<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures (Includes Subrecipients)
Communities Designed to Support Cardiovascular Health for Older Adults	93.866	DU 800080	5R01AG049970	0	295,372
Longitudinal Evaluation of Familial Frontotemporal Dementia Subjects (LEFFTDS)	93.866	MAORO TRU-194007-07	1U01AG045390-01A1	0	239,686
Psychosocial protective factors in cognitive and brain aging	93.866	UMICH 3004295136	4R00AG47963-03	0	189,293
Dominantly Inherited Alzheimer	93.866	WASHU WU-15-186	2UF1AG032438-07	0	180,385
ARMADA: Advancing Reliable Measurement in Alzheimer s Disease and cognitive Aging	93.866	NWU 60048330CU	U2CAG057441	0	170,736
Replication and Extension in African Americans of AD Sequencing	93.866	UMIAMI SPC-000756	1U01AG052410-01	0	170,057
Einstein Aging Study - Project 2	93.866	AECM 31043W	2P01AG003949-32	0	166,464
Benfotiamine in Alzheimer s Disease: A pilot study	93.866	WMBMRI CU15-1104	1R01AG043679-01A1	0	152,728
Whole Genome Sequencing in Ethnically Diverse Cohorts for the ADSP Follow Up Study (FUS)	93.866	UMIAMI SPC-000789	U01AG057659	0	152,711
Exploring the Role of the Brain Epigenome: Cognitive Decline and Life Experience	93.866	RUMC 09111306-sub3	1RF1AG036042-01	0	151,788
Stress, Epigenetics, and Aging	93.866	EMORYU A008616	1R01AG058704-01	0	139,218
Subclinical Vascular Contributions to Alzheimer's Disease: The Multi Ethnic Study of Atherosclerosis (MESA) Multisite Study of AD	93.866	WFUHS 551083	1R01AG058969-01	0	124,738
Re-visiting Methods for MCI Diagnosis to Improve Biomarker and Trial Findings	93.866	UCSD 73333288	1R01AG049810-01A1	0	116,738
Integrative Pathways to Health & Illness	93.866	UWIS 834K164	1U19051426-01A1	0	116,655
The Action for Health in Diabetes ADRD study (LookAHEAD-MIND)	93.866	WFUHS 552702	1R01AG058571-01	0	103,554
Coordinating Center for Genetics and Genomics of Alzheimer s Disease (CGAD)	93.866	UPENN 573913	1U54AG052427-01	0	103,187
Identifying the molecular systems, networks, and key molecules that underlie cognitive resilience	93.866	RUMC 17021705-Sub02	1R01AG057911-01	0	91,615
Coordinating Center for Genetics and Genomics of Alzheimer's Disease (CGAD)	93.866	UPENN 573913	1U54AG052427-01	0	86,620
Healthy Heart, Healthy Brain? A pooled life-course cohort for dementia risk assessment	93.866	11276sc	1RF1AG054443-01	0	82,557
Prevention of Alzheimer s disease in women: risks and benefits of hormone therapy	93.866	MAORO THE-234899-02	1RF1AG057547-01	0	82,099

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Coordinating Center for Genetics and Genomics of Alzheimer s Disease (CGAD)	93.866	UPENN 573913	1U54AG052427-01	0	78,624
PP2A Dysregulation in the Pathogenesis of alphaSynucleinopathies	93.866	RUTGERS 0131	1R01NS101134-01	0	69,007
Genomic Characterization of Alzheimer s Disease Risk in the Puerto Rican population	93.866	UMIAMI 667606	1RF1AG054074-01	0	67,154
Coordinating Center for Genetics and Genomics of Alzheimer's Disease (CGAD)	93.866	UPENN 573913	1U54AG052427-01	0	66,022
Building Novel Predictive Networks for High- throughput In-Silico Key Driver Prioritization to Enhance Drug Target Discovery in AMP-AD and M2OVE-AD	93.866	UA 469320	7RF1AG057457-02	0	64,767
Whole Genome Sequencing in Ethnically Diverse Cohorts for the ADSP Follow Up Study (FUS)	93.866	UMIAMI SPC-000789	U01AG057659	0	64,310
A Longitudinal Network Study of Alzheimer's and Dementia Care in Relation to Disparities in Access and Outcomes	93.866	VNSNY 4616CU	1R56AG056347-01	0	62,823
Communities Designed to Support Cardiovascular Health for Older Adults	93.866	DU 800180	3R01AG049970-04S1	0	60,806
Child Maltreatment and Risk for Mild Cognitive Impairment and Alzheimer's Disease	93.866	RFCUNY CM00001842-00	1R01AG05863-01A	0	60,066
Alzheimer s Disease Genetics Consortium	93.866	UPENN 573992	5U01AG032988	0	57,423
THE FOUR REPEAT TAUOPATHY NEUROIMAGING INITIATIVE	93.866	UCSF 10375sc	R01AG038791	0	57,050
Cognitive Function, Alzheimer's Disease and Related Disorders in the HAALSI Cohort	93.866	HARVARD 116362-5111693	1R01AG054066-01A1	0	56,125
Tau-Sliceosome Interactions in Alzheimer s Disease	93.866	BCMH 7000000572	5R01AG053960-02	0	55,417
Predicting post-transplant mortality and global functional health based on pre-transplant functional status in liver transplantation	93.866	UCSF 10865sc	1R01AG059183-01	0	50,000
Understanding cellular and transcriptional regulatory changes in human aging	93.866	AECM 311426	1R01AG057422-01A1	0	49,759
Role of permanently farnesylated prelamin in the cardiovascular disease of aging	93.866	JHU 2003965088	1R21AG058032-01	0	43,603
Improving Health Outcomes for an Aging Population	93.866	NBER 4135G.30.16.Columbia	2P01AG005842-30	0	42,920
Long-term impact of random assignment to intensive lifestyle intervention on Alzheimer's disease and related dementias: The Action for Health in Diabetes ADRD study (LookAHEAD-MIND)	93.866	WFUHS 552702	1R01AG058571-01	0	41,176
Sustaining Quality of Life of the Aged: Heart Transplant or Mechanical Support?	93.866	NWU 60040682 CU	5R01AG047416-03	0	38,328
Áfrican Áncestry and the Genomic Árchitecture of AD and Other Common Neurodegenerative Disease Neuropathologies	93.866	RUSH 15092401-Sub03-Amend01	5R01AG054058-02	0	38,034

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Acute Effects of Cannabis on Cognition and Mobility in Older HIV-Infected and Uninfected Women	93.866	AECM 311343	1R21AG059505-01	0	37,608
What Does Health Insurance Do? Evidence from the Oregon Health	93.866	NBER 4126B.COLUMBIA	2R01AG034151-06A1	0	36,266
Loss of Numb in Muscle Dysfunction in Aging	93.866	BVMRF 1RO1AG060341-1	1R01AG060341-01	0	35,687
Alzheimer s Clinical Trials Consortium (ACTC) (U24)	93.866	USC 105637272	U24AG057437	0	29,305
ARMADA: Advancing Reliable Measurement in Alzheimer's Disease and cognitive Aging	93.866	NWU 60048330CU	U2CAG057441	0	28,026
National Alzheimer s Coordinating Center	93.866	UWASH UWSC7720	2U01AGB016976-16	0	25,034
Changing Long Term Care in America: Policies, Markets, Strategies and Outcomes	93.866	BU 00001005	5P014G027296-08	0	24,569
The Alzheimer Disease Sequence Analysis Collaborative	93.866	CWRU CU18-0913	1U01AG058654-01A1	0	21,198
Prevention of Alzheimer s disease in women: risks and benefits of hormone therapy	93.866	MAORO THE-234899-02	1RF1AG057547-01	0	19,667
Temporal Trends, Novel Imaging and Molecular Characterization of Preclinical and Clinical Alzheimer s Disease in the Framingham Cohorts	93.866	UTHSCSA 164208/163074	7R01AG054076-03	0	18,829
Genetic Epidemiology of Early-Onset Alzheimer s disease in Caribbean Hispanics and non Hispanic Whit	93.866	UMIAMI SPC-000135	1RF1AG054080-01	0	14,899
Health and Retirement Study Yrs 29-34	93.866	UMICHG 3004822521	U01AG009740	0	14,262
Alzheimer s Disease Neuroimaging Initiative 3 (ADNI3)	93.866	USC 79634713	U19AG02	0	12,070
Mindfulness Meditation and Insomnia in Alzheimer Disease Caregivers: Inflammatory and Biological Aging Mechanism	93.866	UCLA 2000 G VK311	5R01AG056424-02	0	11,820
Replication and Extension in African Americans of AD Sequencing	93.866	UMIAMI SPC-000756	1U01AG052410-01	0	11,025
Life Course Process of Alzheimer's Disease: Sex Difference and Biosocial Mechanisms	93.866	5113228	5R01AG057800-02	0	10,686
Health and Retirement Study Yrs 29-34	93.866	UMICHG 3004822521	U01AG009740	0	9,825
Slow wave sleep (SWS) and the effect of African ancestry on amyloid burden, a longitudinal study	93.866	NYU 17-A1-00-007453-01	1R01AG056531-01A1	0	9,340
THE FOUR REPEAT TAUOPATHY NEUROIMAGING INITIATIVE	93.866	UCSF 10375sc	R01AG038791	0	5,128
Slow wave sleep (SWS) and the effect of African ancestry on amyloid burden, a longitudinal study	93.866	NYU 17-A1-00-007453-01	1R01AG056531-01A1	0	4,207

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Health and Retirement Study Yrs 29- 34: Harmonized Cognitive Assessment Protocol (HCAP)	93.866	UMICHG 3004832623	U01AG058499	0	(Includes Subrecipients) 3,93
Consortium for Alzheimer s Sequence Analysis (CASA) Ü19 PENN	93.866	UPENN 564315	1UF1AG047133-01	0	3,482
Health and Retirement Study Yrs 29- 34: Harmonized Cognitive Assessment Protocol (HCAP)	93.866	UMICHG 3004832623	U01AG058499	0	3,079
Replication and Extension in African Americans of AD Sequencing	93.866	UMIAMI SPC-000756	1U01AG052410-01	0	1,200
Pitavastatin to Reduce Physical Function Impairment and Frailty in HIV (PREPARE)	93.866	BWH CU17-1188	1R01AG054366-01A1	0	888
Consortium for Alzheimer s Sequence Analysis (CASA) Project 2	93.866	UPENN 564315	1UF1AG047133-01	0	190
Frailty and Functional Status in Older Liver Transplant Patients	93.866	UCSF 8976sc	5K23AG048337-02	0	
Longitudinal Evaluation of Familial Frontotemporal Dementia Subjects (LEFFTDS)	93.866	MAORO TRU-194007-07	1U01AG045390-01A1	0	-30
Integrative Pathways to Health & Illness	93.866	UWIS 834K164	1U19051426-01A1	0	-1,71
PHÁSÉ II STÚDY TO EVALUATE THE IMPACT ON BIOMARKERS OF RÉSVERATROL TREATMEN IN PATIENTS WITH MILD TO MODERATE ALZHEIMER S DISEASE	T 93.866	CUCSD ADC-008 10-00-	5 U01 AG10483	0	-7,56
				\$0	\$5,563,218
Vision Research					
Translational Gene Therapy for CNGB1 Retinitis Pigmentosa	93.867	MSU RC108391UC	R24EY027285	0	163,772
African Descent and Glaucoma Evaluation Study (ADAGES) IV: Alterations of the lamina cribrosa in progression	93.867	UAB 000512884-002	1R01EY026574-01A1	0	162,888
Mechanistic Studies on Regenerative Medicine Approaches to Childhood Blindness	93.867	UIO 1001607458	R01EY026682-01	0	141,04
Translational Gene Therapy for CNGB1 Retinitis Pigmentosa	93.867	MSU RC108391UC	R24EY027285	0	56,08
3D-Fast Optical Interface for Rapid Volumetric Neural Sensing and Modulation	93.867	UCOL FY19.946.001	1R21EY029458-01	0	53,74
HÉY: Hispanic Study	93.867	UTEXAS 1R21EY029605-01(01)	1R21EY029605-01	0	43,570
Mechanistic Studies on Regenerative Medicine Approaches to Childhood Blindness	93.867	UIO 1001607458	R01EY026682-01	0	37,69
Clinical and genetic analysis of retinopathy of prematurity	93.867	1005935 COLUMBIA	2R01EY019474-04	0	25,19

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Ocular Hypertension Treatment Study 20-Year Follow-Up Clinical Center Grant	93.867	WU-16-137	1UG1EY025181-01	0	17,104
xADAGES III: Contribution of genotype to glaucoma phenotype in African Americans	93.867	UCSD 61152595	1R01EY023704	0	8,730
Ocular Hypertension Treatment Study 20-Year Follow-Up Clinical Center Grant	93.867	WU-16-137	1UG1EY025181-01	0	5,596
Multiple Scales of Representation in V1	93.867	NYU F4415-01	1R01EY025673-01	0	-1,747
				\$0	\$713,675
ledical Library Assistance					
Casual Inference in Large - Scale Time - Series with Rare Events and Latent Variables	93.879	SIT 2102255-01	5R01LM011826-07	0	150,942
Tempral relation discovery for clinical text	93.879	CHMCB RSTFD0000653987	2R01LM010090-05	0	8,921
				\$0	\$159,863
ational Institutes of Health Acquired Immunodeficiency Syndrome Resear	ch Loan Repa	ayment Program			
HIV Prevention Trials Network (HPTN) Leadership Group					
	93.936	FHI 0080-0025	U01 AI068619	13,609	525,633
				\$13,609	\$525,633
oal Miners Respiratory Impairment Treatment Clinics and Services					
Multiplex RNA imaging in single cells by superresolution microscopy and barcode FISH	93.965	CALTECH 68D-1097567	1R01HD075605	0	4,850
				\$0	\$4,850
ternational Research and Research Training					
Circulating microRNAs in extracellular vesicles, household air pollution and lung development in Ghana	93.989	0255-A051-4609	1R21TW010957-01	0	32,234
Injury and Trauma Research Training program for Botswana	93.989	UPenn 570884	1-D43-TW-010448-01	0	10,989
Bangladesh Center for Global Environmental and Occupational Health	93.989	UCHICAGO FP056723-D	1U2RTW010122-01	0	6,565
Circulating microRNAs in extracellular vesicles, household air pollution and lung development in Ghana	93.989	0255-A051-4609	1R21TW010957-01	0	1,682
KNMU-SUNY HIV Research Training Program	93.989	RFSUNY 100-1132446-74921	5DA43TW010046-03	0	316

For year ended June 30, 2019

For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Bangladesh Center for Global Environmental and Occupational Health	93.989	UCHICAGO FP056723-D	1U2RTW010122-01	0	276
				\$0	\$52,062
Total Pass-through Programs				\$2,204,277	\$55,467,494
Total: National Institute of Health				\$80,698,029	\$526,860,546
State / City Government					
Pass-through Awards					
Food & Drug Administration					
A Randomized, DoubleBlind, Placebo and ActiveControlled, Crossover Study to Evaluate the Abuse Potential of Oxymorphone Compared to Other Mu Opioid Agonists in Physically Dependent Opioid Users with M	93	RFMH 26766	HHSF223201710119C	0	48,629
Substance Abuse & Mental Health ServicesAdministration					
National Suicide Prevention Evaluation	93	RFMH 26497	HHSS2832012000071/HHSS28342002	0	210,420
				\$0	\$259,049
Environmental Health					
Prenatal endocrine-disrupting chemicals and social/cognitive risk inmothers and infants: Potential biologic pathways	93.113	RFMH 137497	5R01ES027424	0	264,938
				\$0	\$264,938
Mental Health Research Grants					
Cognitive ans Neural Mechanisms of the Accelerated Aging Phenotype in PTSD	93.242	RFMH 26738	1R01MH111596-01A1	0	368,645
Antecedents of Suicidal Behavior Related Neurobiology	93.242	RFMH 26976	2P50MH090964-05	0	364,843
Adult Hippocampal Neuroplasticity and Depression	93.242	RFMH 25938	5R01MH083862-07	0	282,102
Temporal Specification of neuronal function and its relevance to mental health	93.242	RFMH 26515	5R56MH106809-02	0	197,848
Structure and function of dopamine receptors	93.242	SRFMH 26468	5R01MH054137-19	0	197,344
The Neurobiology of Violence in a Psychosis-Risk Cohort	93.242	RFMH 26737	1R01MH113861-01	0	181,798

For year ended June 30, 2019

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Developmental regulation of mood states by 5-HT1A heteroreceptors	93.242	SRFMH 26235	5R01MH105675-03	0	149,855
Functionally selective D2R s, striatal circuit function and motivation	93.242	RFMH 26444	5R01MH093672-08	0	131,868
Antecedents of Suicidal Behavior Related Neurobiology	93.242	RFMH 143875	2P50MH090964-06	0	127,026
HIV Center for Clinical and Behavioral Studies	93.242	SRFMH 141803	2P30MH043520-30	0	126,774
Sensory-learning deficits and conversion to psychosis among individuals at clinical high-risk: a longitudinal model-based fMRI study	93.242	RFMH 26493	5R21MH110700-02	0	101,871
Targeting cotransmission for circuit-specific pharmacotherapy	93.242	RFMH 27032	1R01MH117128-01	0	92,822
HIV Center for Clinical and Behavioral Studies	93.242	RFMH 26913	2P30MH043520-30	0	91,709
Deficient Belief Updating as a Convergent Computational Mechanism of Psychosis	93.242	RFMH 27033	5R01MH114965-02	0	89,067
Control and Reward Circuits as Targets for Repetitive Thoughts and Behaviors	93.242	RFMH 25991	R01MH104648	0	88,252
Targeting Dopaminergic Mechanisms of Slowing to ImproveLate Life Depression (R33 Phase)	93.242	SRFMH 27103	4R33MH110029-03	0	85,317
2/2 Familial Early-Onset Suicide Attempt Biomarkers	93.242	RFMH 26230	1R01MH108032-01	0	82,743
Three Generations at High and Low Risk for Depression Followed Longitudinally	93.242	RFMH 26658	2R1MH036197-29A1	0	75,171
Neural Signature of Fear Overgeneralization in Trauma Exposed Adults	93.242	SRFMH 124376	1R01MH105355-01A1	0	72,943
Neural Mechanisms of Food Choice in Anorexia Nervosa	93.242	SRFMH 26227	5R01MH105452-04	0	70,632
Temporal Dynamics of Neurophysiological Patterns as Treatment Targets in SZ	93.242	RFMH 26985	7R01MH109289-04	0	64,927
1/2 Task control circuit targets for obsessive compulsive behaviors in children	93.242	RFMH 27047	R01MH115024	0	64,485
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	64,465
Hospital Discharge Planning and Transition to Outpatient Psychiatric Care	93.242	RFMH 26439	1R01MH106558-01A1	0	63,958
PRIDE SSA - Partnerships in Research to Implement and Disseminate Sustainable and Scalable Evidence Based Practices in sub-Saharan Africa	93.242	RFMH 26657	5U19MH113203-02	0	62,683
HIV Center for Clinical and Behavioral Studies	93.242	RFMH 141806	2P30MH043520-30	0	61,874

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Does the Addition of Cognitive Remediation to Coordinated Specialty Care Services Improve Functional Outcome?	93.242	RFMH 27104	1R34MH118318-01	0	(Includes Subrecipients) 61,84
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	61,070
Thalamo-Prefrontal interactions in cognition: which cortical layers are involved?	93.242	RFMH 138638	R21MH117454-01	0	57,14
2/5 Neurocognitive and neuroimaging biomarkers: predicting progression towards dementia in patients with treatment resistant late-life depression.	93.242	RFMH 26754	1R01MH114980-01	0	55,537
Early Cortical Processing in Schizophrenia	93.242	RFMH 27066	2R01MH049334-27A1	0	46,697
Mechanisms of Antidepressant NonResponse in Late Life Depression	93.242	RFMH 25816	5R01MH102293-05	0	46,240
Individualized Risk Prediction in Persons at Clinical High Risk for Psychosis Using Neruomelanin-Sensitive MRI	93.242	RFMH 27054	1R01MH117323-01	0	45,817
HIV Center for Clinical and Behavioral Studies	93.242	RFMH 26913	2P30MH043520-30	0	45,602
HIV Center for Clinical and Behavioral Studies	93.242	SRFMH 141803	2P30MH043520-30	0	44,877
Maternal exposure to antidepressants and psychiatric outcomes among offspring in a national birth cohort	93.242	RFMH 141316	1R01MH118247-01	0	41,592
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	38,84
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	38,84
Integrating evidence-based MDD treatment in primary care: TB in Brazil as a model and point of-of-entry	93.242	SRFMH 26431	5K01MH104514-04	0	30,963
HIV Center for Clinical and Behavioral Studies	93.242	RFMH 141806	2P30MH043520-30	0	30,529
Longitudinal Assessment of Neural Circuits in Adolescents with Anorexia Nervosa	93.242	RFMH 26643	1R01MH110445-01A1	0	29,927
Identifying Reproducible Brain Signatures of Obsessive Compulsive Profiles	93.242	RFMH 26719	1R01MH113250-01	0	29,860
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	29,656
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	25,599
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	23,143
Risk and Resilience Trajectories to Young Adulthood: The role of Perinatal HIV	93.242	SRFMH 120104	2R01MH069133-11	0	19,759

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrocipionto	R&D Cluster  Total Expenditures
Catal Orantor / 1 dos tirodgn Orantor	CFDA	<u>PTOJECT NO</u>	rass-tillough Contract Number	<u>Subrecipients</u>	(Includes Subrecipients)
Return to Work RCT: Counseling After Fatigue Treatment in HIV/AIDS	93.242	RFMH 25887	5R01MH102161-02	0	15,684
Imaging Stimulant Effects on Emotional Liability in Children with ADHD	93.242	SRFMH 113943	1R01MH101172-01	0	13,473
Gaze-contingent music reward therapy for social anxiety	93.242	RFMH 26951	1R61MH116089-01	0	12,973
Optimizing and Personalizing Interventions for Schizophrenia Across the Lifespan (OPAL)	93.242	RFMH 26918	1P50MH115843-01	0	12,420
Human Trial of Allosteric Modulator Alpha7 Nicotinic Receptors in Schizophrenia	93.242	RFMH 26508	7U01MH094247-06	0	12,106
Antecedents of Suicidal Behavior Related Neurobiology	93.242	SRFHM 26160/26454/26695	5P50MH090964-05	0	6,887
Pathways to successful aging among perinatally HIV-infected and exposed young adults. Risk resilience, and the role of HIV (CASAH4)	93.242	RFMH 142647	2R01MH069133-16	0	3,280
Antecedents of Suicidal Behavior Related Neurobiology	93.242	RFMH 26454	4P50MH090964-04	0	155
Antecedents of Suicidal Behavior Related Neurobiology	93.242	SRFHM 26160/26454/26695	5P50MH090964-05	0	-59
1/2-Novel Medication Strategies Targeting Brain Mechanisms in Pediatric OCD	93.242	RFMH 25451	5R34MH095502-02	0	-1,255
Early Cortical Processing in Schizophrenia	93.242	RFMH 25602	4R01MH049334-25	0	-2,217
				\$0	\$4,238,015
Substance Abuse and Mental Health Services Projects of Regional and Natio	nal Significa	ance			
Improving Life Trajectories for Youth with Early Psychosis	93.243	RFMH 26005	5H79SM061900-03	0	37,533
Improving Life Trajectories for Youth with Early Psychosis	93.243	RFMH 26005	5H79SM061900-03	0	11,087
				\$0	\$48,620
Alcohol Research Programs					
HealthCall: Enhancing brief intervention for HIV primary care alcohol dependence	93.273	RFMH 25998	5R01AA023163-05	0	119,437
A Pilot Study of Deep Brain Stimulation for Alcohol Dependence	93.273	RFMH 26368	1R21AA023879-01A1	0	26,038
Community I-STAR Mozambique : Community Implementation of SBIRT using Technology for Alcohol use Reduction in Mozambique	93.273	RFMH 27048	1R01AA025947-01	0	15,923

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

				R&D Cluster		
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)	
				\$0	\$161,398	
Drug Abuse and Addiction Research Programs						
Shared Pharmacotherapeutic Strategies for Cannabinoid & Opioid Use Disorders	93.279	RFMH 26955	5U54DA037842-05	0	263,344	
Health and justice: a continuum of care for HIV and SU for justice involved youth	93.279	RFMH 130318	1 R01 DA043122-01	0	186,495	
Impulsivity in Cocaine Abusers: Relationship to Drug-Taking and Treatment Outcome	93.279	RFMH 25925	5R01DA035846-05	0	161,827	
Preclinical Synthetic Cannabinoid Vapor Inhalation: Acute and Chronic Effects	93.279	RFMH 26139	1R01DA039123-01	0	145,540	
Functional connectome analysis of amphetamine action at dopamine neuron synapses	93.279	RFMH 26054	R01DA038966	0	132,714	
Risk and Benefits of Overdose Education and Naloxone Prescribing to Heroin Users	93.279	SRFMH 25987	1R01DA035207-01A1	0	114,237	
Medication Development for Opioid and Alcohol Abuse: Laboratory Studies on Humans	93.279	RFMH 26686	5R01DA039169-02	0	107,268	
DSM-IV and DSM-5 Alcohol/Substance Disorders: Reliability, Validity in NESARC-III	93.279	RFMH 25962	2R01DA018652-06A1	0	97,580	
Medical Marijuana Program Participation and Changes in Controlled Substance Use	93.279	RFMH 27031	R21DA045267-01	0	68,144	
Evaluation of Safety and Pharmacokinetics of Naltrexone Implant	93.279	RFMH 27041	1UG3DA047720-01	0	62,699	
The role of thalamic dopamine D2 receptors in cocaine intake	93.279	RFMH 26705	1R21DA044329-01	0	60,947	
Evaluation of safety and pharmacokinetics of naltrexone implant	93.279	RFMH 27041	1UG3DA047720-01	0	59,003	
Évaluation of an F-18 Agonist PÉT Ligand for 5HT2AR	93.279	RFMH 26504	1R21DA041670-01A1	0	23,992	
An ultra-long-acting oral treatment for opioid use disorder	93.279	RFMH 27133	1UG3DA047709-01	0	18,543	
Cognitive Control in Children of SUD Parents: A Longitudinal Multimodal MRI Study	93.279	RFMH 26191	1R01DA038154-01A1	0	15,956	
A Sequenced Behavioral and Medication Intervention for Cocaine Dependence	93.279	RFMH 26430	5R01DA034087-05	0	14,158	
Web-based Addiction Treatment Cultural Adaptation with American Indians	93.279	RFMH 26748	1R34DA040831-01A1	0	11,486	
Antecedents and Consequences of Cocaine Taking: Impact of Oxytocin	93.279	RFMH 26741	1R01DA041543-01	0	8,428	

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Medical Marijuana Laws and MTF Teen Marijuana Use and Attitudes Since 1991	93.279	SRFMH CU11-0649	R01DA034244	0	(Includes Subrecipients) 760
				\$0	\$1,553,121
Discovery and Applied Research for Technological Innovations to Improve	Human Healt	h			
Noninvasive Quantification of Brain Glucose Metabolism Using a Portable Positron Emission Tomography Camera.	93.286	RFMH 27000	1R01EB026481-01	0	98,980
				\$0	\$98,980
Frans-NIH Research Support					
Breaking The Cycle Of Intergenerational Disadvantage: Neurodevelopment Among Puerto Rican Children	93.310	RFMH 27027	1UG3OD023328-01	0	252,216
Breaking The Cycle Of Intergenerational Disadvantage: Neurodevelopment Among Puerto Rican Children	93.310	RFMH 27027	1UG3OD023328-01	0	127,501
Breaking The Cycle Of Intergenerational Disadvantage: Neurodevelopment Among Puerto Rican Children	93.310	RFMH 27027	1UG3OD023328-01	0	-169
				\$0	\$379,548
Lung Diseases Research					
Sleep and Well-being in High Risk Youth	93.838	RFMH 26555	1R01HL134856-01	0	65,967
				\$0	\$65,967
Extramural Research Programs in the Neurosciences and Neurological Disc	orders				
Targeting Dopaminergic Mechanisms of Slowing to Improve Late Life Depression	93.853	RFMH 26478	1R61MH110029	0	80,257
				\$0	\$80,257
Child Health and Human Development Extramural Research					
Use of Novel Mobile Technology to Screen Sexual Partners for HIV and STIS	93.865	RFMH PO#128918	5R01HD088156-04	0	236,930
				\$0	\$236,930
Aging Research					
Novel Cognitive and Functional Measures for Alzheimer's Disease Prevention Trials	93.866	SRFMH 139964	1R01AG051346-01A1	0	112,209

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Sensation and Psychiatry: Linking Age-Related Hearing Loss to LateLife Depression and Cognitive Decline	93.866	RFMH 138639	1R21AG059130-01	0	93,719
Physical and Mental Fatigability in Late Life Clinical Populations	93.866	RFMH 26495	1R21AG053202-01	0	65,277
Social convoys, cognitive reserve, and resilience across the lifespan	93.866	RFMH 140250	1R56AG059643-01	0	26,850
Physical and Mental Fatigability in Late Life Clinical Populations	93.866	RFMH 26495	1R21AG053202-01	0	8,256
				\$0	\$306,311
International Research and Research Training					
PALOP MH Implementation Research Training Program	93.989	RFMH 25941	5D43TW009675-02	0	33,605
				\$0	\$33,605
Maternal and Child Health Services Block Grant to the States					
Provision of Prenatal and Clinical Genetic Counseling Services	93.994	SDH C029422	HRSA	0	1,857
				\$0	\$1,857
Total Pass-through Programs				\$0	\$7,728,596
Total: State / City Government				<u>\$0</u>	\$7,728,596
National Science Foundation					
Direct Awards					
Engineering					
DMREF: Collaborative Research: Designing Optimal Nanoparticle Shapes and Ligand Parameters for Polymer Grafted Nanoparticle Membranes	47.041	CBET-1629502		0	376,291
EFRI ACQUIRE: Development of Heterogenous Platform for Chip Based Quantum Information Applications	47.041	EFMA-1641094		247,166	247,166
Molecular scale Breaking due to Repeated Loading in Molecular Shuttles	47.041	CMMI-1662329		0	179,851
GOALI: Laser Forming of Metal Foam with Controlled Dimensional and Mechanical Properties	47.041	CMMI-1725980		0	169,350
EFRI NewLAW: Novel Approaches to RF Non-Reciprocity in Semiconductor Systems	47.041	EFMA-1641100		168,816	168,816

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
CAREER: Optimization-based Quantification of Statistical Uncertainty in Stochastic and Simulation Analysis	47.041	CMMI-1834710		0	(Includes Subrecipients) 168,144
NRI: FND: Scalable Multimodal Tactile Sensing for Robotic Manipulators in Manufacturing	47.041	CMMI-1734557		0	155,198
Collaborative Research: REU Site: Nano-NY	47.041	EEC-1659808		0	153,465
PFI-TT: Pushing the limits of color quality and efficiency in solid state lighting with colloidal quantum dots	47.041	IIP-1827726		0	147,170
GOALI: Omics and metabolically informed out selection of Nitrospira spp. and Comammox bacteria from energy efficient engineered nitrogen removal processes	47.041	CBET-1706726		0	146,880
High Fidelity Probabilistic Structural Health Monitoring	47.041	CMMI 1563364		0	146,018
Online algorithms for service systems	47.041	CMMI-1538088		0	141,475
CAREER: Structure and Functional Imaging of the Atrial Myocardium	47.041	CBET-1454365		0	141,360
CAREER: SusChEM: Tunable Electrocatalysis at Buried Interfaces	47.041	CBET-1752340		0	140,422
E2CDA: Type I: Collaborative Research: Interconnects Beyond Cu	47.041	ECCS-1740270		0	132,663
Virtual Experiments and Design of Particulate Composites with the Inclusion based Boundary Element Method (iBEM)	47.041	CMMI 1762891		0	120,288
Collaborative Research: Hybrid Discrete Continuum Numerical Simulation of Granular Materials	47.041	CBET-1706689		0	118,951
EFRI ACQUIRE: Development of Heterogenous Platform for Chip Based Quantum Information Applications	47.041	EFMA-1641094		0	113,285
Data Driven Queueing Models for Healthcare: Accounting for Stochastic Dependence and Time Dependence	47.041	CMMI-1634133		0	110,768
CAREER: Growth and Remodeling of the Uterine Cervix During Pregnancy	47.041	CMMI-1454412		0	109,685
ČÁŘEÉŘ: Exploiting Many-Particle Physics for Low-Energy Nanoelectronics	47.041	ECCS-1752401		0	108,951
Multi-Component Reactive Pressure-dependent Chemistry Verified by Multi-Scale Uncertainty Quantification	47.041	CBET-1706252		0	105,257
RoL: EAGER: DESYN C3 Enzyme cascades in synthetic membraneless organelles	47.041	CBET 1844149		0	104,101
CAREER: Operationally aware design of Matching Markets	47.041	CMMI 1653477		0	103,935
Compressive Sampling for Uncertainty Modeling and Quantification of Dynamical Systems Subject to Highly Limited/Incomplete Data	47.041	CMMI-1724930		0	102,903

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Droject No.	Pass-through Contract Number	Cubracinianta	R&D Cluster
<del>-</del>	CFDA	<u>Project No</u>	Pass-tillough Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
CAREER: Tailoring Rheological Behavior and Interlayer Properties of 3 D Printing Concrete	47.041	CMMI-1653419		0	102,774
Predictive Optimization of T cell Expansion	47.041	CBET-1743420		17,543	97,403
Assembling Nanoparticle Arrays at Fluid Interfaces	47.041	CBET-1603043		0	96,301
CAREER: Biophysical Mechanisms Underlying the Generation of Tissue Structure and Mechanics	47.041	CMMI-1751841		0	88,526
Managing Patient Flows with Congestion Effect	47.041	CMMI-1350059		21,824	88,413
SuSCheM: Environmentally Sustainable Pathways for Extracting Valuable Elements from Electronic Wastes	47.041	CBET-1706905		0	86,092
Collaborative Research: Active Transport of Lipid Vesicles in Osmotic Gradients	47.041	CBET-1804332		0	82,839
CAREER: Virtual Modular Power (VMP) Conversion	47.041	ECCS-1653574		0	82,705
CDS&E: Collaborative Research: Autonomous Systems for Experimental and Computational Data Generation and Data Driven Modeling of Combustion Kinetics	47.041	CBET 1761491		0	82,658
CAREER: A Path Integral Methodology for Accurate and Computationally Efficient Stochastic Analysis of Diverse Dynamical Systems	47.041	CMMI-1748537		0	77,759
Collaborative Research: A Contact Lens-Based Glucose Nanosensor Using Affinity Polymer-Functionalized Graphene	47.041	ECCS-1509760		0	71,828
Collaborative Research: Operations Driven Machine Learning	47.041	CMMI 1763000		0	70,654
Coastal SEES (Track 2) Collaborative: Developing High Performance Green Infrastructure Systems to Sustain Coastal Cities	47.041	CMMI-1325676		12,466	59,743
EFRI NewLAW: Novel Approaches to RF Non-Reciprocity in Semiconductor Systems	47.041	EFMA-1641100		0	59,201
Phase II IUCRC Columbia University: Center for Energy Harvesting Materials and Systems (CEHMS)	47.041	IIP-1738802		0	51,046
13th World Congress in Computational Mechanics New York, New York July 22 27, 2018	47.041	CMMI-1745832		0	50,000
NRI: FND: Scalable Multimodal Tactile Sensing for Robotic Manipulators in Manufacturing	47.041	CMMI-1734557		0	46,679
Collaborative ResearchL Strategic Planning of Internet Services in the Presence of User-Initiated Innovations: Implications for Network Neutratity	47.041	CMMI-1435378		0	46,427
A phase field Arlequin model for resolving nonlocal hydromechanical effects of porous media across time and spatial scales	47.041	CMMI-1462760		0	44,990
Concurrent Enhancement of Fatigue Life and Corrosion Resistance via Laser Shock Peening	47.041	CMMI 1761344		0	44,580
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For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Collaborative Research: Joint UFL/CUI/UCR Center for Particulate and Surfactant Systems	47.041	IIP-1362078		0	(Includes Subrecipients) 37,836
ÉAGÉR SitS: Signaling the Health Of Tree-pit Soil (SHOTS)	47.041	CMMI 1841615		0	36,953
CAREER: Stochastic processes in high dimensions: from asymptotic analysis to algorithms	47.041	CMMI-1551829		0	36,484
A Robust Framework for Modeling Preferences and its Applications in Revenue Management	47.041	CMMI-1636046		0	36,388
CAREER: Systemic Risk and Strategic Formation in Stochastic Networks	47.041	CMMI-1752326		0	36,141
Collaborative Research: REU Site: Nano-NY	47.041	EEC-1659808		0	32,179
DMREF: Collaborative Research: Designing Optimal Nanoparticle Shapes and Ligand Parameters for Polymer Grafted Nanoparticle Membranes	47.041	CBET-1629502		0	29,695
Coastal SEES (Track 2) Collaborative: Developing High Performance Green Infrastructure Systems to Sustain Coastal Cities	47.041	CMMI-1325676		0	29,031
CAREER: Tailoring Rheological Behavior and Interlayer Properties of 3 D Printing Concrete	47.041	CMMI-1653419		0	24,040
Wireless control of implantable microdevices	47.041	ECCS-1509748		21,757	21,757
Phase II IUCRC Columbia University: Center for Energy Harvesting Materials and Systems (CEHMS)	47.041	IIP-1738802		0	21,187
RoL: EAGER: DESYN C3 Enzyme cascades in synthetic membraneless organelles	47.041	CBET 1844149		0	19,517
Wireless control of implantable microdevices	47.041	ECCS-1509748		0	17,500
Molecular scale Breaking due to Repeated Loading in Molecular Shuttles	47.041	CMMI-1662329		0	16,000
CAREER: A Data-driven Robust Approach for Large Scale Dynamic Optimization	47.041	CMMI-1351838		0	15,315
Coastal SEES (Track 2) Collaborative: Developing High Performance Green Infrastructure Systems to Sustain Coastal Cities	47.041	CMMI-1325676		0	14,024
RoL: EAGER: DESYN-C3: Mimicking Mitochondria: Developing Synthetic Pathways to Power Pseudo-Cell Functions using Diverse Fuel Resources	47.041	CBET 1844254		0	12,869
CAREER: Optimization Methods to Support Real time Personalized Consumer Transactions	47.041	CMMI 1653770		0	10,811
CAREER: Contact Charge Electrophoresis for Mobile Microfluidics	47.041	CBET-1738191		0	10,421
ÉARS: Cross Layering in Full Duplex - From Integrated Circuits to Networking	47.041	ECCS-1547406		0	10,022

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	xpenditures Subrecipients) 9,437 9,093
NRI: FND: Scalable Multimodal Tactile Sensing for Robotic Manipulators in Manufacturing 47.041 CMMI-1734557 0  I Corps: 3D Capturing Technology Based on Light Fields	9,437
I Corps: 3D Capturing Technology Based on Light Fields 47.041 IIP 1916337 0	
	8,000
CAREER: Exploiting Many-Particle Physics for Low-Energy Nanoelectronics 47.041 ECCS-1752401 0	
EFRI ACQUIRE: Development of Heterogenous Platform for Chip Based Quantum Information Applications 47.041 EFMA-1641094 7,886	7,886
EARS: Cross Layering in Full Duplex - From Integrated Circuits to Networking 47.041 ECCS-1547406 0	7,738
Coastal SEES (Track 2) Collaborative: Developing High Performance Green Infrastructure Systems to Sustain Coastal Cities  47.041  CMMI-1325676  0	7,372
Coastal SEES (Track 2) Collaborative: Developing High Performance Green Infrastructure Systems to Sustain Coastal Cities 47.041 CMMI-1325676 0	6,761
Switched-Mode Signal Processing: An Innovative Paradigm for High Performance Analog in Nanoscal CMOS 47.041 ECCS-1309721 0	6,643
GOALI: Laser Forming of Metal Foam with Controlled Dimensional and Mechanical Properties 47.041 CMMI-1725980 0	6,569
Concurrent Enhancement of Fatigue Life and Corrosion Resistance via Laser Shock Peening 47.041 CMMI 1761344 0	6,091
CAREER: Engineering Bacteria Swarming for Biotechnology 47.041 CBET 1847356 0	6,000
Multi-Component Reactive Pressure-dependent Chemistry Verified by Multi-Scale Uncertainty Quantification 47.041 CBET-1706252 0	5,400
EARS: Cross Layering in Full Duplex - From Integrated Circuits to Networking 47.041 ECCS-1547406 0	5,111
GOALI: Laser Forming of Metal Foam with Controlled Dimensional and Mechanical Properties 47.041 CMMI-1725980 0	3,884
CAREER: Engineering Bacteria Swarming for Biotechnology 47.041 CBET 1847356 0	3,299
Planning Grant: Engineering Research Center for Advanced Streetscape Sensing, Communications and Computing (ASTRSCC) 47.041 EEC-1840540 0	2,928
2018 Biomedical Engineering Society (BMES) - Cellular and Molecular Bioengineering (CMBE)  Conference  47.041  NSF 1748291  0	2,839
Strength and Reliability of Large Area CVD Graphene 47.041 CMMI-1437450 0	1,723
NRI: FND: Scalable Multimodal Tactile Sensing for Robotic Manipulators in Manufacturing 47.041 CMMI-1734557 0	1,347
Planning Grant: Engineering Research Center for Advanced Streetscape Sensing, Communications and Computing (ASTRSCC)  47.041 EEC-1840540  0	626

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
CAREER: Biophysical Mechanisms Underlying the Generation of Tissue Structure and Mechanics	47.041	CMMI-1751841		0	600
EFRI ACQUIRE: Development of Heterogenous Platform for Chip Based Quantum Information Applications	47.041	EFMA-1641094		0	-92
SusChEM: Rational design of aqueous interfaces of Earth abundant and nontoxic	47.041	CBET-1336845		0	-135
GOALI/Collaborative Research: Interfacial Mechanics of Atomically-Thin Graphene in Multi ayered Laminate Composites	47.041	CMMI-1363093		0	-260
Wireless control of implantable microdevices	47.041	ECCS-1509748		0	-19,250
EFRI NewLAW: Novel Approaches to RF Non-Reciprocity in Semiconductor Systems	47.041	EFMA-1641100		0	-62,681
				\$497,458	\$5,638,110
Mathematical and Physical Sciences					
Experimental Physics Research Program at Columbia University/Nevis Laboratories	47.049	PHY-1707971		0	732,287
The XENON1T Dark Matter Project: A Project Proposal from the US Institutions of the XENON Collaboration	47.049	PHY-1209979		0	522,073
Experimental Physics Research Program at Columbia University/Nevis Laboratories	47.049	PHY-1707971		0	473,050
Collaborative Research: Continuation of the Dark Matter Search with XENON1T at LNGS	47.049	PHY-1719286		0	382,898
Construction of the TPC Readout Electronics for the LAr1-ND Experiment	47.049	PHY-1505313		0	272,561
DMREF: Deblurring our View of Atomic Arrangements in Complex Materials for Advanced Technologies	47.049	DMR-1534910		0	216,925
Control and Characterization of the Morphology and Photophysics of Conjugated Molecules in Isolation and in Aggregate	47.049	CHE-1807931		0	213,332
Metallacarbatrane, Hydride Fluoride, and Metal-Metal Bonded Compounds of the Main Group Elements: Synthesis and Applications	47.049	CHE-1465095		0	198,876
SusChEM: Unjamming the Growth of Metal Pnictide Synthesis	47.049	CHE-1710352		0	195,221
Collaborative research: Discrete and topological models for template guided genome rearrangements	47.049	DMS 1764366		0	192,356
Collaborative Research: Continuation of the Dark Matter Search with XENON1T at LNGS	47.049	PHY-1719286		108,554	185,836
SusChEM: The Use of Ti-C Bonds for RNC Insertions and Dynamic Kinetic Resolutions	47.049	CHE-1664566		0	183,331

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	168,011
CAREER: Searching for Dark Matter and Studying Galactic Particle Accelerators with VERITAS	47.049	PHY-1352567		0	167,011
Quantum Processing via Four-Wave Mixing	47.049	PHY-1707918		0	159,040
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		143,531	158,531
Momentum conversation in optoelectronic processes at 2D van der Waals semiconductor heterojunctions	47.049	DMR-1608437		0	153,160
CAREER: Precision Measurements with Ultracold Diatomic Molecules	47.049	PHY-1349725		0	149,296
Problems in Complex Analysis and Complex Geometry	47.049	DMS-1266033		0	149,023
CDS&E: The development of open-source software with an application to modeling the formation of globular star clusters	47.049	AST-1615955		0	141,920
Laboratory Measurements of three deuterium substitution reactions important in interstellar chemistry	47.049	AST-1613267		0	141,481
Dynamics and Transport in Strongly Interfacing	47.049	CHE-1464802		0	140,658
Excitations in Landau Levels of Two-dimensional Quantum Fluids	47.049	DMR-1306976		0	140,085
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	134,841
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	128,552
NSF/DMR-BSF: Auger Recombination in Two-Dimensional Quantum Confined Semiconductors	47.049	DMR-1809680		0	125,224
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	122,251
Stochastic Controls, Portfolios, and Competing Particle Systems	47.049	DMS-1405210		0	118,286
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	118,018
Collaborative Research: Mergers of Massive Black Holes at the Centers of Galaxies	47.049	AST-1715661		0	114,833
Langlands Correspondences and Motivic L Functions	47.049	DMS-1701651		0	113,567
Partial Differential Equations in Riemannian Geometry	47.049	DMS-1649174		0	112,762

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Estimation, Computation, and Uncertainty Quantification in Structured Regression Models	47.049	DMS-1712822		0	110,518
Towards Self-Assemblying active micro-structures	47.049	DMR-1703873		0	109,822
Photoactivator Chemistry in Atmospheric Aerosols	47.049	CHE-1506789		29,070	108,685
Collaborative Research: Statistical Methods, Algorithms, and Theory for Large Tensors	47.049	DMS-1803450		0	107,968
REU Site: Nevis Labs, Columbia University for Summers 2017-2019	47.049	PHY-1659528		0	107,317
CDS&E: Scanning Electrochemical Microscopy with Compressed Sensing: Beyond the Point Probe	47.049	CHE-1710400		0	106,868
CHaS: The Circumgalactic H-alpha Spectrograph	47.049	AST-1407652		0	105,944
A Study of the Faint Debris Remnant of Large Galaxy, Small Galaxy Interactions	47.049	AST-1614743		0	104,755
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	103,263
Molecular Conductance and Induced Reactivity in Group 14 Constructs	47.049	CHE-1764256		0	103,195
Signatures of Shocks and Particle Acceleration from Novae in our Galaxy	47.049	AST-1615084		0	102,714
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	101,668
Collaborative Research: SusChEM:Rational Design of Non-Precious Metal Catalysts for a Future Biorefining Industry	47.049	CHE-1566104		0	95,261
Family Floer Cohomology	47.049	DMS-1609148		0	93,306
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	92,923
Nonlinear Geometric Partial Differential Equations: Entire Solutions and Regularity	47.049	DMS-1600658		0	91,435
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	90,744
Ideal Probe Single Molecule Imaging for the Study of Small Molecule and Polymeric Glass Formers	47.049	CHE 1660392		0	90,563
EAGER: Enabling Quantum Leap: Scalable, Controllable and Tunable Room-Temperature Quantum Emitters in Monolayer WSe2	47.049	DMR-1838475		0	89,485
The Microscopic Electronic Structure of Iron Superconductors Under Strain: New Frontiers in Scanning Probe Microscopy	47.049	DMR-1610110		0	87,514

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Risk Assessment and Decision Making Under Uncertainty with Applications	47.049	DMS 1812661		0	(Includes Subrecipients) 84,987
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	84,945
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	84,030
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	81,474
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	78,405
Collaborative Research: GOALI: Graphene	47.049	DMR-1411107		0	77,501
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	77,407
Probing the structure and electronics of self-assembled carbene monolayers	47.049	CHE-1807654		0	75,938
Collaborative Research: Scalable Kilo-Pixel Detector Modules Based on Polarization Sensitive Multi-Chroic Aluminum Manganese MKIDs	47.049	AST-1711160		0	74,722
The Role of Grafting Mechanism on the Self Assembly and Properties of Polymer Nanocomposites	47.049	DMR-1709061		0	73,842
Incomplete Markets and Financial Bubbles in Mathematical Finance	47.049	DMS-1714984		0	72,52°
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	70,866
Modeling Spin Configurations and Ranking	47.049	DMS-1712037		0	70,550
Problems in General Relativity and Geometric Flows	47.049	DMS-1810856		0	70,150
The Stacks Project in Algebraic Geometry	47.049	DMS-1601160		0	70,010
Periodic Phenomena and the Evolution of Cataclysmic Variable Binary Stars	47.049	AST-1615456		0	67,688
Singularity Formation in Geometric Flows	47.049	DMS-1806190		0	67,414
Collaborative Research: MRI: Development of Apparatus for the Cold Molecule Nuclear Time Reversal EXperiment (CeNTREX)	47.049	PHY 1827964		0	67,342
Multi-Scale Computational Methods for Coastal Flooding	47.049	DMS-1720288		0	67,287
DMREF: Deblurring our View of Atomic Arrangements in Complex Materials for Advanced Technologies	47.049	DMR-1534910		0	67,048

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Scaling Limits of Growth in Random Media	47.049	DMS 1811143		0	67,017
CAREER: Fractal Bandstructure by Superlattice Patterning	47.049	DMR-1462383		0	64,775
Collaborative Research: Phase-Change Materials for Strong Optical Modulation and Nonvolatile Optical Memory	47.049	DMR-1610215		0	64,726
The XENON1T Dark Matter Project: A Project Proposal from the US Institutions of the XENON Collaboration	47.049	PHY-1209979		4,164	64,526
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	62,864
Collaborative Research: Consistent Risk Estimation under High Dimensional Asymptotics	47.049	DMS 1810888		0	62,077
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	62,018
FRG: Collaborative Research: Integrable Probability	47.049	DMS-1664650		0	60,246
CAREER: Statistical inference of network and relational data	47.049	DMS-1554804		0	59,706
Creating Dynamic and Adaptive Force Producing Nanostructures	47.049	DMR-1807514		0	59,394
Molecular Conductance and Induced Reactivity in Group 14 Constructs	47.049	CHE-1764256		0	58,632
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	57,900
Collaborative Research: Continuation of the Dark Matter Search with XENON1T at LNGS	47.049	PHY-1719286		0	57,840
FRG: Collaborative Research: Floer homotopy theory	47.049	DMS-1564172		0	57,210
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	57,014
Molecular Conductance and Induced Reactivity in Group 14 Constructs	47.049	CHE-1764256		0	56,899
Understanding Discoveries, Maximizing Science and Enabling Best Data of Advanced LIGO During the Regular Detection Era	47.049	PHY-1708028		0	55,830
Waves in Complex Media and Applications	47.049	DMS-1412560		0	55,708
Experimental Physics Research Program at Columbia University/Nevis Laboratories	47.049	PHY-1707971		0	55,631
Random Planar Geometry	47.049	DMS-1811092		0	54,929

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Qualitative Properties of Solutions to Nonlinear Elliptic Partial Differential Equations	47.049	DMS-1800645		0	53,779
Probing the structure and electronics of self-assembled carbene monolayers	47.049	CHE-1807654		0	53,172
Heegner Points, L Functions of Elliptic Curves, and Generalizations	47.049	DMS 1802269		0	52,488
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	50,791
Collaborative Research: Continuation of the XENON Dark Matter Search at LNGS	47.049	PHY-1413495		0	49,804
Collaborative Research: New Structures in Link Homology and Categorification	47.049	DMS-1807425		0	49,771
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	49,704
FRG: Collaborative Research: Vertorial and geometric problems in the calculus of variations	47.049	DMS-1361131		0	48,033
FRG: Collaborative Research: Crossing the Walls in Enumerative Geometry	47.049	DMS-1564497		0	47,964
CDS&E: Scanning Electrochemical Microscopy with Compressed Sensing: Beyond the Point Probe	47.049	CHE-1710400		0	47,496
Mathematical Theory of Resonances and Applications	47.049	DMS-1800086		0	45,821
Collaborative Research: Plasmonic lasing with two dimensional heterostructures in the intrinsic regime	47.049	DMR 1809361		0	45,513
Understanding Discoveries, Maximizing Science and Enabling Best Data of Advanced LIGO During the Regular Detection Era	47.049	PHY-1708028		0	42,754
IsoDAR Neutrino Target R&D and Engineering	47.049	PHY-1707969		0	41,953
Collaborative Research: Rational Design of Anticancer Drug Combinations using Dynamic Multidimensional Theory	47.049	NSF 1545805		0	40,737
Numerical Analysis of Smoothed Particle Hydrodynamics Type Methods via Nonlocal Models	47.049	DMS-1719699		0	40,635
The Trace Formula Method and the Arithmetic and Geometry of Modular Varieties in the Langlands Program	47.049	DMS 1802292		0	40,548
CAREER: Molecular Engineering of Charge Transfer in Polymeric Materials	47.049	DMR-1351293		0	40,294
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	40,189
Quantum Groups, Special Functions, and Integrable Probability	47.049	DMS-1701654		0	39,274

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	(Includes Subrecipients) 39,146
Criticality and Nonlinearity in Interacting Particle Systems and Stochastic Partial Differential Equations	47.049	DMS-1712575		0	38,927
Energizing Photospheres of Gamma-Ray Bursts	47.049	AST-1816484		0	37,341
Homological Invariants in Low Dimensional Topology	47.049	DMS-1811210		0	35,465
CHaS: The Circumgalactic H-alpha Spectrograph	47.049	AST-1407652		0	35,254
Improving and Extending Models of Gamma-Ray Burst Afterglows	47.049	AST-1716567		0	35,061
CAREER: Enabling a Rich Astro-particle and Exotic Physics Program in DUNE	47.049	PHY-1753228		0	30,284
Modeling Solute Diffusion in Polymeric Membranes for Gas Separations	47.049	DMR-1507030		0	30,166
OP: Collaborative Research: Landau levels and Dirac points in Continuouis Photonic Systems	47.049	DMS-1620418		0	29,792
Modeling Ion Extraction from First Toroidal Electron-Cyclotron-Resonance Ion Source	47.049	PHY-1632802		0	29,612
FRG: Collaborative Research: Vertorial and geometric problems in the calculus of variations	47.049	DMS-1361131		0	28,434
Mathematics and Control of Systemic and High Frequency Trading Risks	47.049	DMS-1716145		0	27,376
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	27,193
A Bridge to the Future	47.049	AST-1539931		0	27,177
CAREER: Two-Dimensional Quantum Fabric of Ultracold Dipolar Molecules	47.049	PHY-1848466		0	27,015
Collaborative Research:The Hierachical Mergers of Low Mass Galaxies	47.049	AST-1715944		0	26,286
Regularity problems in the calculus of variations and elliptic PDEs	47.049	DMS-1500438		0	23,714
Assessing the Columbia Bridge-to-PhD Program's First Decade	47.049	AST-1742716		0	23,491
FRG: Collaborative Research: Categorifying Quantum Three Manifold Invariants	47.049	DMS-1664255		0	23,211
Physical Manifestations of Chaos and Regularity Around Galaxies	47.049	AST-1715582		0	23,124

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<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Symbiotic Stars and Citizen Science in the Age of Time-Domain Astrophysics	47.049	AST-1616646		0	22,233
Solution Theories and Scaling Limit roblems in Stochastic Partial Differential Equations	47.049	DMS-1712684		0	21,345
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	20,893
Geometric Flows and Canonical Kahler Metrics	47.049	DMS-1710500		0	20,279
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	19,806
CAREER: Fixing Stellar Chronometers with Open Clusters	47.049	AST-1255419		0	19,683
Geometry of random Loewner chains	47.049	DMS-1308476		0	19,310
The XENON1T Dark Matter Project: A Project Proposal from the US Institutions of the XENON Collaboration	47.049	PHY-1209979		0	16,627
Discrete models and conformally invariant limits	47.049	DMS-1512853		0	16,093
Towards One-Dimensional Single-Molecule Topological Insulators	47.049	DMR-1807580		0	15,646
Beyond Single-Molecule Conductance: Understanding and Controlling Charge Transport by External Stimuli and Supramoleculer Interactions	47.049	DMR-1507440		0	15,590
GOALI: Multiprobe Investigations of Electron Transport in 2D Electronic Devices	47.049	DMR-1809122		0	15,337
New Platforms for Catalysis	47.049	CHE-1464992		0	14,708
Collaborative Research: Scalable Kilo-Pixel Detector Modules Based on Polarization Sensitive Multi-Chroic Aluminum Manganese MKIDs	47.049	AST-1711160		0	14,087
The Vibrational Structure of Atomically-Precise Nanostructures: From Molecular Clusters to Quantum Dots	47.049	CHE-1709464		0	14,047
A Novel Statistical Framework For Big Data Prediction	47.049	DMS-1513408		0	13,502
CAREER: Two-Dimensional Materials with Addressable Surfaces	47.049	DMR-1751949		0	13,248
Infrared spectroscopy and nano-imaging of iron arsenide superconductors	47.049	DMR-1608096		0	12,946
ACM IMS Interdisciplinary Summit on the Foundations of Data Science	47.049	DMS 1934146		0	12,616
Workshop on Plasma Physics of Neutron Star Mergers	47.049	PHY-1841897		0	12,133

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For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
CAREER: Complex Coacervation in Cells	47.049	DMR 1848388		0	11,779
Collaborative Research: A Multi-Frequency Campaign to Probe Neptune's Dynamics and Deep Atmospheric Structure	47.049	AST-1615448		0	11,282
Beyond Single-Molecule Conductance: Understanding and Controlling Charge Transport by External Stimuli and Supramoleculer Interactions	47.049	DMR-1507440		0	11,164
Dynamics of Organic Reactions	47.049	CHE-1465040		0	10,821
FRG: Collaborative Research: Crossing the Walls in Enumerative Geometry	47.049	DMS-1564497		0	9,948
p-adic Automorphic forms, p-adic L-functions and Selmer groups	47.049	DMS-1407239		0	9,016
Symplectic topology, symmetries and singularities	47.049	DMS-1505798		0	8,789
Ongoing Accretion on a Galactic Disk and primordial Galaxies	47.049	AST-1410800		0	8,230
Quantum Phase Transitions in Mott Insulator Systems and Itinerant Electron Magnets: MuSR Studies of Magnetic Order, Volume Evolution and Spin Fluctuations	47.049	DMR-1610633		0	7,130
CAREER: Spectroscopy of Metals from Ab Initio Quantum Chemistry	47.049	CHE-1848369		0	6,807
Link homology, cohomological operations, and categorification at roots of unity	47.049	DMS-1406065		0	6,732
Quantum Phase Transitions in Mott Insulator Systems and Itinerant Electron Magnets: MuSR Studies of Magnetic Order, Volume Evolution and Spin Fluctuations	47.049	DMR-1610633		0	5,045
FRG: Collaborative Research: Integrable Probability	47.049	DMS-1664650		0	3,869
Collaborative Research: Continuation of the XENON Dark Matter Search at LNGS	47.049	PHY-1413495		0	3,697
Foundations of Algebraic Stacks	47.049	DMS-1303247		0	3,686
Directly Testing the Presence of Large-Scale Multiphase Flows in the Galactic Halo	47.049	AST-1312888		0	3,391
A Study of the Faint Debris Remnant of Large Galaxy, Small Galaxy Interactions	47.049	AST-1614743		0	2,433
Workshop on Transport and Localization in Random Media: Theory and Applications	47.049	DMS-1804339		0	1,505
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	1,384
FRG: Collaborative Research: Floer homotopy theory	47.049	DMS-1564172		0	1,195

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures (Includes Subrecipients)
The Role of Grafting Mechanism on the Self Assembly and Properties of Polymer Nanocomposites	47.049	DMR-1709061		0	1,050
Construction of the TPC Readout Electronics for the LAr1-ND Experiment	47.049	PHY-1505313		0	983
Development of ultrathin intermetallic phases for giant spin Hall effects	47.049	DMR-1411160		0	704
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	502
Mean Field Games and Optimal Contracts	47.049	DMS-1714607		0	414
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	61
Collaborative Research: A Survey of Galaxy Evolution and Star Formation over the Past 4.6 Billion Years	47.049	AST-1413102		0	-175
Columbia University Materials Research Science and Engineering Center	47.049	DMR-1420634		0	-1,524
				\$285,319	\$13,187,149
Geosciences					
2018-2023 Ship Operations -R/V Marcus G. Langseth	47.050	OCE-1829304		0	6,587,092
A Proposal to Manage the U.S. Science Support Program Office associated with the International Ocean Discovery Program (USSSP-IODP)	47.050	OCE-1450528		3,984,081	6,186,823
Oceanographic Technical Services, LDEO, 2018 - 2023	47.050	OCE-1827282		0	3,870,800
2018-2023 Ship Operations -R/V Marcus G. Langseth	47.050	OCE-1829304		0	1,539,129
Ship Operations 2012-2017	47.050	OCE-1211494		0	1,459,762
LTER Palmer, Antarctica (PAL) Land-Shelf-Ocean Connections, Ecosystem Resilience and Transformation in a Sea-Ice Influenced Pelafic Ecosystem	47.050	PLR-1440435		848,588	985,137
2018-2023 Ship Operations -R/V Marcus G. Langseth	47.050	OCE-1829304		0	962,792
IEDA 2016-2021: Operation of a Multi-Disciplinary Data Facility for the Earth Science Community - EarthChem/SESAR	47.050	OCE-1636653		167,945	908,136
Collaborative Research: Alteration of Mantle Peridotite: Geochemical Fluxes and Dynamics of far from Equilibrium Transport	47.050	EAR-1516300		326,236	902,135
Rolling Deck to Repository (R2R) 2014-2019	47.050	OCE-1447797		530,773	867,599

For year ended June 30, 2019

,					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Hikurangi Trench Regional Electromagnetic Survey to Image the Subduction Thrust	47.050	OCE-1737328		640,805	824,086
Collaborative Research: EaSM2: Linking Near-term Future Changes in Weather and Hydroclimate in Western North America to Adaption for Ecosystem and Water Management	47.050	AGS-1243204		0	652,315
IEDA 2016-2021: Operation of a Multi-Disciplinary Data Facility for the Earth Science Community - EarthChem/SESAR	47.050	OCE-1636653		61,781	602,086
IEDA 2016-2021: Operation of a Multi-Disciplinary Data Facility for the Earth Science Community - EarthChem/SESAR	47.050	OCE-1636653		0	565,971
Collaborative Research: Subduction below Extreme Sedimentation A Multidisciplinary Transect from the Ganges-Brahmaputra Delta to the IndoBurma Backarc	47.050	EAR-1714892		0	481,479
A Proposal to Manage the U.S. Science Support Program Office associated with the International Ocean Discovery Program (USSSP-IODP)	47.050	OCE-1450528		0	399,739
Collaborative Research: Marine EM Survey of Fluids in the Alaskan Megathrust	47.050	OCE-1654652		184,197	385,245
A Proposal to Manage the U.S. Science Support Program Office associated with the International Ocean Discovery Program (USSSP-IODP)	47.050	OCE-1450528		0	370,771
2017-2020 Provision of Log Data Reduction and Database Services for Scientific Ocean Drilling	47.050	OCE-1741698		0	362,061
Ship Operations 2012-2017	47.050	OCE-1211494		0	330,977
Development of low Nitrogen: Phosphorus Ratios in the Euphotic Zone - The Phosphorus Side of the Story	47.050	OCE-1737240		0	330,367
The Essential Dynamics of Tropical Rain Belts: Monsoons and Inter-Tropical Convergence Zone (ITCZ) in a Multi-model Ensemble of Idealized Simulations	47.050	AGS-1565522		36,060	315,684
IEDA 2016-2021: Operation of a Multi-Disciplinary Data Facility for the Earth Science Community - EarthChem/SESAR	47.050	OCE-1636653		46,115	284,236
Collaborative Research: U.S. Geotraces Arctic Section: 230th, 232th and 231Pa tracers of trace element supply and removal	47.050	OCE-1434479		0	277,800
Lamont Doherty Core Repository: Curation, Service Professional Development, Outreach	47.050	OCE-1559059		0	275,020
Causes of Climate Extremes-generating Ocean States	47.050	OCE-1657209		0	236,993
Collaborative Research: A High-Sensitivity 10Be and Extraterrestrial 3He Record from an Ice Core at South Pole	47.050	PLR-1443448		0	221,201
Collaborative Research: Role of small-sized protists in the microbial loop with emphasis on interactions between mixotrophic prolists and picocyanobacteria	47.050	OCE-1458070		0	216,727
Collaborative Research: Navigating the New Arctic (NNA): Soundscape Ecology to Assess Environmental and Anthropogenic Controls on Wildlife Behavior	47.050	OPP-1839198		0	215,106
Collaborative Proposal: EarthCube Integration: Pangeo: An Open Source Big Data Climate Science Platform	47.050	OCE-1740648		88,825	213,844

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
WSC-Category 3 Collaborative: America s Water-The Changing Landscape of Risk, Competing Demands and Climate	47.050	EAR-1360446		15,617	(Includes Subrecipients) 210,324
Ship Operations 2012-2017					
	47.050	OCE-1211494		0	209,260
Collaborative Research: Adding animals to the equation: assessing herbivore impacts on carbon cycling in northern Alaska	47.050	PLR-1603777		0	199,882
Acquisition of a Fourier Transform Infrared Imaging Microscope at LDEO	47.050	EAR-1748684		0	197,305
Collaborative Research: Seismic Imaging of Volcano Construction, Underplating and Flexure along the Hawaii-Emperor Seamount Chain	47.050	OCE-1737245		0	182,298
Heinrich event iceberg flux, melting, and ocean circulation in the North Atlantic	47.050	AGS-1635019		0	177,984
EaSM-3 Collaborative Research: Local and remote regional climate responses to regional forcings from short-lived climate dorcers	47.050	AGS-1419398		125,672	176,495
The Madden Julian Oscillation and the Maritime Continent	47.050	AGS-1543932		0	174,184
Collaborative Research: Examining Linkages Between the Agulhas Leakage and Ocean Overturning in the Last Glacial Cycle and Through the Mid-Pleistocene Transition	47.050	OCE-1831415		0	173,232
CNH: Competing demands and future vulnerability of groundwater: Drinking water quality and food security in arsenic-impacted South and Southeast Asia	47.050	ICER-1414131		46,919	170,260
Collaborative Proposal: Determining the Vulnerability and Resilience of Boreal Forests and Shrubs across Northwestern North America	47.050	PLR-1603473		0	165,779
Sea Surface Temperature-Forced Monsoon Evolution and Variability in West Africa	47.050	AGS-1612904		0	165,514
Collaborative Research: Uncertainty in Predictions of 21st Century Ocean Biogeochemical Change	47.050	OCE-1818501		0	147,646
Collaborative Research: Ocean Acidification: Impacts of Evolution on the Response of Phytoplankton Populations to Rising C02	47.050	OCE-1314336		0	147,582
Collaborative Research: A systems approach to understanding linkages between the Ross Ocean and ice Shelf Environment, and Tectonic settling Through Aerogeophysical surveys and modeling (ROSETTA)	47.050	OPP-1443534		0	146,927
Collaborative Research: Closing the Gaps in Climate Models Surface Albedo Schemes of Processes Driving the Darkening of the Greenland Ice Sheet	47.050	OPP-1713072		0	146,409
Collaborative Research: Along Strike Variation in Shallow, Offshore Strain Accumulation and Slow Slip at Hikurangi Subduction Margin, New Zealand	47.050	OCE-1754929		0	145,535
Collaborative Research: Landscape Rvolution in the McMurdo Dry Valleys: Erosion Rates and Real-time Monitoring of Rock Breakdown in a Hyperarid, Subzero Environment	47.050	OPP-1744895		0	145,027
Collaborative Research: Rio Grande Rise: New Questions on Plume Dynamics Atlantic Tectonic Evolution and an Important Window to the African LLSVP	47.050	OCE-1558734		0	144,748
Support for the U.S. GEOTRACES Project Office	47.050	OCE-1536294		0	141,145

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Mechanisms of Mediterranean Region Hydroclimate Variability and Change	47.050	AGS-1734760		0	140,135
Was Subantarctic dust a major driver of past CO2 variability	47.050	OPP-1405204		0	139,814
REU Site: Interdisciplinary Cutting-Edge Research though the Analysis of Global Data	47.050	OCE-1757602		0	139,385
Response of high-latitude forests to a warmer and CO2-enriched atmosphere: tree rings in a process-based model	47.050	PLR-1504134		0	136,338
Understanding Forced Asian Monsoon Changes in Observations and Coupled Model Intercomparison Project - Phase 5 (CMIP5) Models	47.050	AGS-1607348		0	134,676
Collaborative Research: Ice Sheet Sensitivity in a Changing Arctic System - using Geologic Data and Modeling to test the Stable Greenland Ice Sheet Hypothesis	47.050	OPP-1503959		0	131,917
CAREER: Investigating the Impact of Temporal and Spatial Variations on Lava Emplacement Through Numerical and Physical Models	47.050	EAR-1654588		0	130,197
Collaborative Research: East Antarctic Glacial Landscape Evolution (EAGLE): A study using combined thermochronology, geochronology and provenance analysis	47.050	PLR-1443565		0	128,225
GP-IMPACT: Science Technology Engineering and Math Student Experiences Aboard Ships (STEMSEAS)	47.050	ICER-1701168		0	126,946
Collaborative Research: Investigating the Air-Sea Energy Exchange in the Presence of Surface Gravity Waves by Measurements of Turbulence Dissipation, Production and Transport	47.050	OCE-1756839		0	125,698
Modeling aqueous secondary organic aerosol formation	47.050	AGS-1546136		0	124,437
Collaborative Research: Role of Cloud Albedo and Land Atmosphere Interactions on Continental Tropical Climates	47.050	AGS-1734156		22,147	116,693
Tectonics in the Western Anatolian Extensional Province from sequence stratigraphic modeling of multichannel seismic data in the Gulf of Kusadasi	47.050	OCE-1559098		10,030	116,174
Collaborative Research: Reconstructing Spatiotemporal Climatic Patterns for Northeastern Canada	47.050	AGS-1602022		0	115,552
Collaborative Research: Taking the Reliability of Cenozoic Boron Isotope pH and pCO2 Reconstructions to the Next Level	47.050	OCE-1657974		0	110,793
LTER Palmer, Antarctica (PAL) Land-Shelf-Ocean Connections, Ecosystem Resilience and Transformation in a Sea-lce Influenced Pelafic Ecosystem	47.050	PLR-1440435		0	110,279
Formation and evolution of upper oceanic crust from seismic data acquired over mature oceanic crust near the Sumatra and Alaska Subduction zones	47.050	OCE-1634625		0	109,958
Ventilation History of the Sulu Sea: Record of Abrupt Changes in the Tropical Western Pacific Thermocline	47.050	OCE-1736602		0	109,422
Collaborative Research: Dissolved Phosphorus Processing by Trichodesmium Consortia: Quantitative Partitioning, Role of Microbial Coordination, and Impact on Nitrogen Fixation	47.050	OCE-1332912		0	109,372
CAREER: Evolution of Ocean Mesoscale Turbulence in a Changing Climate	47.050	OCE-1553593		0	109,315

For year ended June 30, 2019

For year ended Julie 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Collaborative Research: Tectonic and Magmatic Processes During Early-Stage Rifting: An Integrated Study of Northern Lake Malawi, Africa	47.050	EAR-1110921		16,060	108,235
Evaluating Mechanisms for the Formation, Propagation and Evolution of Volcanic Rifts and Margins	47.050	OCE-1654745		0	107,703
Advanced Imaging Techniques Combined with In Situ Analyses used to Assess Diagenesis in Benthic Foraminifera	47.050	OCE-1658230		0	107,190
Collaborative Research: Impact of the Amazon River Plume on Nitrogen Availability and Planktonic Food Web Dynamics in the Western Tropical North Atlantic	47.050	OCE-1737128		0	105,553
Collaborative Research: Calibrating Southeast Asian Proxies Speleothems and Tree Rings	47.050	AGS-1602629		0	105,478
Assessing the Impacts of Arctic Amplification on the Midlatitude Circulation with a Hierarchy of Atmospheric General Circulation Models	47.050	AGS-1815138		33,438	105,066
Collaborative Research:Refreezing in the firm of the Greenland Ice Sheet: Spatiotemporal Variability and Implications for Ice Sheet Mass Balance	47.050	PLR-1603331		0	102,100
Facility Support: The Global CMT Project	47.050	EAR-1639131		0	101,688
P2C2: Decomposition and Reconstruction of Drought Variability Across the Continental United States and Northern Mexico	47.050	AGS-1703029		0	100,864
Collaborative Research: Spatiotemporal Variability of Northwestern North American Temperatures in Response to Climatic Forcing	47.050	AGS-1502150		0	100,783
Mapping Variability in the Thermo-mechanical Structure of the North American Plate and Upper Mantle	47.050	EAR-1736165		0	97,764
The Systematics of Helium in Diamond-forming Metasomatic Mantle Fluids	47.050	EAR-1725323		0	96,659
Development and Testing of Pressure Gradient Sensors to Improve Shallow Seafloor Seismic Observation	47.050	OCE-1334746		0	96,611
Oceanographic Technical Services, R/V Marcus G. Langseth, 2012-2016	47.050	OCE-1214328		0	94,403
Reconstruction and Dynamics of Interhemispheric Hydroclimate Variability Between the Americas	47.050	AGS-1602581		0	92,602
West Antartotic Ice Shelf - Ocean Interactions	47.050	OPP-1644159		0	92,402
Synthesis of Internal Wave and Turbulence Observations Across the Antarctic Circumpolar Current	47.050	OCE-1737325		0	92,287
Satellite Observations and Modelling of Surface Meltwater Flow and its Impact on Ice Shelves	47.050	OPP-1743310		7,320	90,354
Collaborative Research: Subduction below Extreme Sedimentation A Multidisciplinary Transect from the Ganges-Brahmaputra Delta to the IndoBurma Backarc	47.050	EAR-1714892		0	87,723
Collaborative Research: Alteration of Mantle Peridotite: Geochemical Fluxes and Dynamics of far from Equilibrium Transport	47.050	EAR-1516300		0	87,707

For year ended June 30, 2019

For year ended Julie 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Collaborative Research: Rapid Magma Ascent Recorded in Volatile Diffusion Profiles	47.050	EAR-1524542		0	85,893
Collaborative Research: Constraints on Sediment Physical Properties at the Cape Fear and Currituck Landslides from Velocity Analysis of New, Open Access Seismic Reflection Data	47.050	OCE-1830717		0	85,010
Water in the Lithosphere: The Fidelity of Mantle Xenoliths	47.050	EAR-1731784		0	84,853
Collaborative Research: Past ocean-atmosphere variability from spatiotemporal patterns of North Atlantic climate during the Common Era	47.050	AGS-1502224		0	81,944
Reconstruction and Dynamics of Interhemispheric Hydroclimate Variability Between the Americas	47.050	AGS-1602581		0	80,319
Collaborative Research: U.S. GEOTRACES Pacific Meridional Transect: Thorium-232, Thorium-231 and Proactinium-231 as Tracers of Trace Element Supply and Removal	47.050	OCE-1737224		0	76,960
NSFGEO-NERC: Collaborative Research: The Central Apennines Earthquake Cascade under a New Microscope	47.050	EAR-1759782		0	76,428
Collaborative Research: Dust deposition, paleo-export production, and migration of the (ITCZ) through the last glacial cycle in the west-central Pacific (Line Islands)	47.050	AGS-1502889		0	74,291
A Southern Hemispheric Perspective on Holocene Climate Variability Based on Mountain Glacial Chronologies	47.050	EAR-1804816		0	74,086
Antarctic Cryospheric Change: Mechanisms and Feedback on Climate	47.050	OPP-1745029		0	73,737
FESD Type 1: Pilocene Maximum Sea Level (PLIOMAX): Dynamic Ice Sheet-Earth Response in a Warmer World	47.050	OCE-1202632		9,207	68,775
CAREER: Monsoon and the Upper Troposphere Lower Stratosphere	47.050	AGS-1802248		28,905	67,870
Collaborative Research: Quantifying the sensitivity of Rifting Processes to Erosion and Sedimentation	47.050	EAR-1650166		0	67,869
Development of low Nitrogen: Phosphorus Ratios in the Euphotic Zone - The Phosphorus Side of the Story	47.050	OCE-1737240		0	67,726
GP-IMPACT: Science Technology Engineering and Math Student Experiences Aboard Ships (STEMSEAS)	47.050	ICER-1701168		0	67,239
Collaborative Research: Arctic GEOTRACES - Nd isotopes and REEs in the Arctic	47.050	OCE-1459716		0	67,021
Collaborative Research: Climate, Human and Ecosystem Interactions in the face of a Rapidly Changing North Asian Biome	47.050	OPP-1737788		0	65,978
Collab Res U.S. GEOTRACES Arctic Section - Water Mass Composition Circulation and Mean Residence Times Derived from Measurements of 18O/D, CFCs. SF6, 3H/#he and 14c	47.050	OCE-1436666		0	62,638
2017 Oceanographic Instrumentation	47.050	OCE-1733592		0	62,034
Earthcube IA: Collaborative Proposal: Interdisciplinary Earth Data Alliance as a Model for Integrating Earthcube Technology Resources and Engaging the Broad Community	47.050	ICER-1541022		0	59,939

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
A Global Survey of Marine Magnetic Anomalies to Constrain the Late Cretaceous-Survey of Marine Magnetic Anomalies	47.050	OCE-1535937		0	58,956
Collaborative Research: Inferences on Cascadia Deformation Front and Plate Interface Properties from Advanced Studies of Active Source Seismic Data	47.050	OCE-1657737		0	58,499
Collaborative Research: Evolution of Arctic Water Column Hydrography during the Holocene Based on a Novel Instrumentation Combination	47.050	PLR-1550041		0	58,128
Love-wave Propragation in Oceanic Upper Mantle: Constraints on Radial Anisotropy and Implications for Dynamics of the Asthenosphere	47.050	OCE-1538229		0	58,116
RAPID: High-Resolution Gravity for Thwaites Glacier	47.050	OPP-1842064		0	56,142
REU Site: Interdisciplinary Cutting-Edge Research though the Analysis of Global Data	47.050	OCE-1757602		0	54,520
Understanding the Integrity of Deep Ice in Antarctica from Geophysical Data Sets and Physical Models	47.050	OPP-1643970		0	54,519
The Madden Julian Oscillation and the Maritime Continent	47.050	AGS-1543932		0	54,404
Collaborative Research: Assessing the Role of Compound-specific Phosphorus Hydrolase Transformations in the Marine Phosphorus Cycle	47.050	OCE-1737083		0	53,237
Collaborative Research: Open Core Data: Transformative Data Infrastructure for Integrating and Accessing Scientific Drilling and Coring Data	47.050	EAR-1550887		0	53,128
P2C2: Diagnosing the Dynamics of Past and Future North American Megadroughts	47.050	AGS-1805490		0	52,997
Reconstructing Last Interglacial Sea Level Based on Models and Observation from the Bahamas	47.050	OCE-1841888		0	51,684
Collaborative Research: Investigating Effects of Geologic Complexity on Induced Seismicity, using M0-M5.7 Seismicity from Prague, Oklahoma	47.050	EAR-1649771		0	51,436
Collaborative Research: Insights into North African climate variability over the last 1.1 million years from dust fluxes and leaf wax isotopes	47.050	OCE-1502925		0	51,073
GEOTRACES Arctic Section: Improving Understanding of Controls on the Distributions of Selected Anthropogenic Radionuclides in the Amerasian Basin	47.050	OCE-1439319		0	50,965
Improved Locations for Global Seismic Events using Surface Waves	47.050	EAR-1520657		0	50,238
Collaborative Research: P2C2-Derivation of Ensemble and Joint-Variable Climate Field Reconstructions of the Common Era Using New Random Field Methods	47.050	AGS-1602920		0	48,975
Support for the U.S. GEOTRACES Project Office	47.050	OCE-1536294		0	47,867
Mechanisms of Mediterranean Region Hydroclimate Variability and Change	47.050	AGS-1734760		0	47,108
Collaborative Research: Influence of Surfactants on Air-Sea Gas Exchange: 3He/SF6 Experiments in the Baltic Sea	47.050	OCE-1756757		0	44,829

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Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Sulfur Isotopic Evidence on the Age of Recycled Surface Material in the Tristan-Gough Plume Source	47.050	EAR-1755514		0	44,619
Collaborative Research: GEOTRACES Pacifice Section - Nd isotopes and REEs in the South Pacific	47.050	OCE-1234687		0	43,979
Collaborative Research: Filling the Triassic Geochronologic Gap: A Continuous Cored Record of Continental Environmental Change in Western North America	47.050	EAR-0958976		31,450	43,396
Comprehensive High-precision Relocation of Global Seismicity	47.050	EAR-1547560		0	42,688
Collaborative Research: Imaging Small-scale Convection and Structure of the Mantle in the South Pacific a US Contribution to International Collaboration PacificArray	47.050	OCE-1658491		0	42,312
GEOTRACES Pacific Section: Dissolved and Particulate Concentrations of Selected Anthropogenic Radionuclides along the U.S. GEOTRACES Peru-Tahiti Zonal Section	47.050	OCE-1235233		0	42,248
Collaborative Research: Deep Circulation over the Flanks of a Mid-Ocean Ridge	47.050	OCE-1735618		0	41,206
Real-Time Power: A Thermoelectric System for Powering Seafloor Instrumentation	47.050	OCE-1820547		0	38,835
RCN: Improving reconstructions of Cenozoic pCO2 and temperature change	47.050	OCE-1636005		0	38,058
Collaborative Research: P2C2-Inferring Spatio-Temporal Variations in the Risk of Extreme Precipitation in the Western United States from Tree Ring Chronologies	47.050	AGS-1702184		0	35,654
Collaborative Research: Seismic Attenuation and Anelasticity in the Upper Mantle: The Effect of Continuous Far-field Dislocation Creep	47.050	EAR-1855423		0	35,189
Collaborative Research: From the Slab to the Surface: Origin, Storage, Accent and Eruption of Violate-Bearing Magmas	47.050	EAR-1456814		0	34,560
Collaborative Research: Improving Constraints on Tropical Climate Feedbacks with Inverse Modeling of the Stable Isotopic Composition of Atmospheric Water Vapor	47.050	AGS-1737813		0	34,052
Final stages of breakup and early spreading history of the Eastern North America passive margin from multichannel seismic data	47.050	OCE-1551807		0	32,774
Water mass structure and bottom water formation in the ice-age Southern Ocean	47.050	PLR-1542962		0	31,851
Collaborative Research: Insights into North African climate variability over the last 1.1 million years from dust fluxes and leaf wax isotopes	47.050	OCE-1502925		0	30,558
Collaborative Research: Persistent Presence in the Ocean Interior: Developing a Low-power, Autonomous System for Geo-referenced Navigation	47.050	OCE-1634215		0	30,422
CEDAR: Analysis of High Resolution Stratospheric Observations of Polar Mesospheric Clouds	47.050	AGS-1452183		29,797	30,421
Collaborative Research: Testing Arctic Ice Sheet Sensitivity to Abrupt Climate Change	47.050	PLR-1417675		0	30,225
Testing the Slab Connection: A Beryllium Isotope Tracer Study in the Trans-Mexican Volcanic Belt	47.050	EAR-1836032		0	28,094

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					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Collaborative Research: Multidisciplinary Analysis of Antarctic Blue Ice Moraine Formation and their Potential as Climate Archives over Multiple Glacial Cycles	47.050	PLR-1443213		0	27,578
The Impact of the Stratosphere on Arctic Climate	47.050	PLR-1603350		0	26,755
Collaborative Research: Ecosystem Dynamics of Western Pacific Hydrothermal Vent Communities Associated with Polymetallic Sulfide Deposits	47.050	OCE-1536650		0	26,333
Collaborative Research: An Eocene Perspective on Future Recovery Rates of Climate and Ocean Chemistry	47.050	OCE-1657848		0	25,367
EarthCube RCN: C4P: Collaboration and cyberinfrastructure for Paleogeosciences	47.050	ICER-1340301		0	24,745
Collaborative Research: P2C2-Inferring Spatio-Temporal Variations in the Risk of Extreme Precipitation in the Western United States from Tree Ring Chronologies	47.050	AGS-1702184		0	24,457
Imaging the Fine Structure of Earthquakes and Faults with High-Precision Aftershocks	47.050	EAR-1520680		0	23,662
Collaborative Research: Development and support of the MB-System software package for processing and display of swatch mapping	47.050	OCE-1260599		0	22,804
Collaborative Research: Dynamics of Unsaturated Downdrafts, Cold Pools, and Their Roles in Convective Initiation and Organization	47.050	AGS-1649770		0	22,739
Collaborative Research Flow, Turbulence and mixing in Mid-Ocean ridge Fracture Zone Canyons	47.050	OCE-1235094		0	18,253
EarthCube RCN: C4P: Collaboration and cyberinfrastructure for Paleogeosciences	47.050	ICER-1340301		0	16,795
Collaborative Research: Dynamics and Variability of Freshwater Components in the Arctic Ocean	47.050	OPP-1504404		0	16,173
Collaborative Research: Understanding the Spatio-Temporal Characteristics of Earthquakes at Axial Seamount Late in an Eruptive Cycle	47.050	OCE-1536320		0	15,825
Development of low Nitrogen: Phosphorus Ratios in the Euphotic Zone - The Phosphorus Side of the Story	47.050	OCE-1737240		0	15,566
Collaborative Research: Changes in Riveraquifer Exchange Induced by Groundwater Pumping, and their Effect on Arsenic Contamination in the Red River Delta Vietnam	47.050	EAR-1521356		0	15,300
Testing the Observation of Annual Seismic Velocity Variations at Axial Volcano	47.050	OCE-1834261		0	15,114
RCN: Improving reconstructions of Cenozoic pCO2 and temperature change	47.050	OCE-1636005		0	15,088
Reconstructing the Paleo-Budget of 231Protactinium in the North Pacific	47.050	OCE-1835997		0	15,082
Collaborative Research: Measuring Strain along the Aleutian Subduction Zone Trench to better Constrain Seismic and Tsunami Hazard	47.050	OCE-1656413		0	14,874
Travel Support for an International Meeting on Monsoons and Tropical Rain Belts: Trieste, Italy July 2-5, 2018	47.050	AGS-1824715		0	14,603

For year ended June 30, 2019

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures (Includes Subrecipients)
Collaborative Research: Establishing Community Standards for Underwater Video Acquisition , Tagging, Archiving and Access	47.050	OCE-1549546		0	14,104
IEDA 2016-2021: Operation of a Multi-Disciplinary Data Facility for the Earth Science Communi EarthChem/SESAR	ty - 47.050	OCE-1636653		0	13,741
EarthCube RCN: iSAmpLEs: The internet of Samples in the Earth Sciences	47.050	ICER-1440351		0	13,683
Collaborative Research: An Experimental Investigation of Reactive Melt channelization in Partia Molten Rocks	47.050	OCE-1459664		0	13,599
Collaborative research: Nano- and micro particle transport prediction in subsurface media: The heterogeneity and structure	role of 47.050	EAR-1721660		0	13,241
Collaborative Research: Holocene Indian Summer Monsoon Variability Reconstructed for Deca Resolved Tibetan Lake Sediments	dally 47.050	EAR-1402133		0	12,322
Collaborative Research: Impact of the Amazon River Plume on Nitrogen Availability and Plankto Food Web Dynamics in the Western Tropical North Atlantic	onic 47.050	OCE-1737128		0	11,764
Collaborative Research: Magnitude and Pathway of Gaseous Atmospheric Mercury Deposition Forests	in 47.050	AGS-1848618		0	11,599
Collaborative Research: Subduction below Extreme Sedimentation A Multidisciplinary Transect the Ganges-Brahmaputra Delta to the IndoBurma Backarc	from 47.050	EAR-1714892		0	11,141
Collaborative Research: The Upper Branch of the Southern Ocean Overturning in the Southern State Estimate: Water Mass Transformation and Pathways of the 3-Dimensional Residual Circu		OCE-1357133		0	11,041
Collaborative Research: Deep Structure of Three Continental Sutures in Eastern North America	47.050	EAR-1147742		0	10,941
Along-strike Variations in Synrift Magmatism on the Eastern North American Margin	47.050	OCE-1654629		0	10,869
Collaborative Research: Seismic Imaging of Volcano Construction, Underplating and Flexure al Hawaii-Emperor Seamount Chain	ong the 47.050	OCE-1737245		0	10,714
Collaborative Proposal: GP-IMPACT: Ambassadors for STEM Training to Enhance Participation (A-STEP)	47.050	ICER-1801634		0	10,386
Do Creeping Faults Ever Host Large Earthquakes? An investigation of Thermal Alteration in the SAFOD Drillcore	47.050	EAR-1358585		0	10,107
Collaborative Research Assessing the Simulated Arctic Freshwater System in CMIP5 Modelsm CESM Large Ensemble, and Forced Simulations	the 47.050	PLR-1504023		0	9,775
Rolling Deck to Repository (R2R) 2014-2019	47.050	OCE-1447797		0	9,726
Dynamic and Thermodynamic Controls on Deep Convection in Organization of Tropical East Pa Convection (OTREC)	acific 47.050	AGS-1758603		0	9,411
Collaborative Research: Ecosystem Dynamics of Western Pacific Hydrothermal Vent Communi Associated with Polymetallic Sulfide Deposits	ties 47.050	OCE-1536650		0	9,403
Collaborative Resaerch: P2C2Multi-Site Paleo-Reconstruction of Missouri River Streamflows for Tree Ring Data	from 47.050	AGS-1404188		0	9,131

For year ended June 30, 2019

For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Collaborative Research: Contributions of Prydz Bay Shelf Water to Antarctic Bottom Water Formation	47.050	OPP-1443444		0	8,830
Collaborative Research: Dynamics of Dissolved Organic Phosphorus Production, Composition and Bioavailability along a Natural Marine Phosphate Gradient	47.050	OCE-1756337		0	8,351
Collaborative Research: P2C2 - Reconstructing South American Monsoon Sensitivity to Internal and External Forcing: Reconciling Models and Tree-ring Proxies in the Central Andes	47.050	AGS-1702789		0	7,944
Collaborative Proposal: EarthCube Integration: Pangeo: An Open Source Big Data Climate Science Platform	47.050	OCE-1740648		0	7,624
Collaborative Proposal: EarthCube Integration: THROUGHPUT: Standards and Services for Community Curated Repositories	47.050	ICER-1740663		0	7,506
EarthCube RCN: iSAmpLEs: The internet of Samples in the Earth Sciences	47.050	ICER-1440351		0	7,107
Collaborative Research: Deep Structure of Three Continental Sutures in Eastern North America	47.050	EAR-1147742		0	6,661
LTER Palmer, Antarctica (PAL) Land-Shelf-Ocean Connections, Ecosystem Resilience and Transformation in a Sea-Ice Influenced Pelafic Ecosystem	47.050	PLR-1440435		0	6,436
Collaborative Research: The North Anatolian Fault system in the Marmara Sea, Turkey - Insights from the Plio-Quaternary evolution of a multi-stranded transform	47.050	OCE-1537614		0	6,405
Geochemical Analysis of Ancient Salt Deposits from the Dead Sea and its Climate and Hydrology During Warmer Periods in the Past 200,000 Years	47.050	EAR-1635391		0	6,277
Collaborative Research: East Antarctic Glacial Landscape Evolution (EAGLE): A study using combined thermochronology, geochronology and provenance analysis	47.050	PLR-1443565		0	6,062
A Combined Experimental and Theoretical Investigation of Reactive Flow in Brittle Media with Applications to Solid Earth Geodynamics	47.050	EAR-1520732		0	5,747
Workshop on Antarctic Surface Hydrology and Future Ice-shelf Stability	47.050	OPP-1743326		2,729	4,175
Workshop on Antarctic Surface Hydrology and Future Ice-shelf Stability	47.050	OPP-1743326		0	3,749
Acquisition of a State-of-the-Art 40Ar/39Ar Geochronology System for the AGES Lab at Lamont-Doherty Earth Observatory	47.050	EAR-1636685		0	3,499
Magma ascent and eruption in the Aleutian arc	47.050	EAR-1551868		0	3,057
Collaborative Research: Imaging Small-scale Convection and Structure of the Mantle in the South Pacific a US Contribution to International Collaboration PacificArray	47.050	OCE-1658491		0	2,853
Hikurangi Trench Regional Electromagnetic Survey to Image the Subduction Thrust	47.050	OCE-1737328		0	1,824
Stratospheric and Tropical Influences on the Mid-Latitude Circulation Response to Rising Greenhouse	47.050	AGS-1317469		0	1,710
Collaborative Research: Cloud-Capable Tools for MG&G-Related Image Analysis of OOI HD Camera Video	47.050	OCE-1700923		0	1,613

·					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Collaborative Research: Defining the biogeochemical drivers of diatom physiological ecology in the North Atlantic	47.050	OCE-1558506		0	946
Collaborative Research: Illuminating the Cascadia Plate Boundary Zone and Accretionary Wedge with a Regional-scale Ultra-long Offset Multi-channel Seismic Study	47.050	OCE-1827452		0	903
Geochemical Analysis of Ancient Salt Deposits from the Dead Sea and its Climate and Hydrology During Warmer Periods in the Past 200,000 Years	47.050	EAR-1635391		0	823
A Combined Experimental and Theoretical Investigation of Reactive Flow in Brittle Media with Applications to Solid Earth Geodynamics	47.050	EAR-1520732		0	689
Photoheterotrophy in Unicellular Cyanobacteria: Ecological Drivers and Significance for Marine Biogeochemistry	47.050	OCE-1434916		0	496
CAREER: Departure from Monin-Obukhov Similarity Theory (MOST) using high-resolution turbulence models	47.050	EAR-1552304		0	426
Collaborative Research: Quantifying Past Water Table Depth and Hydroclimate with Dissolved Noble Gas Isotopes in Groundwater	47.050	EAR-1702571		0	343
Collaborative Research Reconstruction of Carbon Monoxide in the Pre-Industrial Arctic Atmosphere from Ice Cores at Summit Greenland	47.050	PLR-1404158		0	33
WSC-Category 3 Collaborative: America's Water-The Changing Landscape of Risk, Competing Demands and Climate	47.050	EAR-1360446		0	4
				\$7,294,697	\$43,611,623
Computer and Information Science and Engineering					
BD Hubs: NORTHEAST: The Northeast Big Data Innovation Hub	47.070	IIS-1550284		0	533,452
CI-SUSTAIN: Stan for the Long Run	47.070	CNS-1730414		0	465,042
BIGDATA: Collaborative Research: IA: F: Latent and Graphical Models for Complex Dependent Data in Education	47.070	IIS 1633360		0	357,468
TWC: Medium: Toward Trustworthy Mutable Replay for Security Patches	47.070	CNS-1563555		0	355,958
RAISE: Deep Gravitational Wave Exploration, Instrumental Insights and Noise Removal Through Machine Learning	47.070	CCF-1740391		0	271,862
NRI: Collaborative Research: Dynamic Braces for Quantification and Treatment of Abnormal Curves in the Human Spine	47.070	IIS-1527087		0	216,383
CAREER: Biologically Inspired neural network models for robust speech processing	47.070	IIS-1555079		0	207,910
SaTC: TTP Option: Medium: Scalable Web Transparency: New Scientific Building Blocks, Tools, and Measurements to Tame the Data-Driven Web	47.070	CNS-1514437		0	203,522
RI:Medium:Incorporating Biologically-Motivated Circuit Motifs into Large-Scale Deep Neural Network Models of the Brain	47.070	IIS 1704938		0	200,267

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
SHF: Large: Collaborative Research: Molecular computing for the real world	47.070	CCF 1832985		0	(Includes Subrecipients) 185,344
CIF: Small: Collaborative: Communication with Energy Harvesting Nodes	47.070	CCF-1526215		0	171,713
CAREER: From Grasp Quality to Hand Quality: Analysis and Optimization for Effective Robot Hands	47.070	IIS-1551631		0	166,139
BIGDATA: Collaborative Research: IA: Hardware and software for spike detection and sorting in massively parallel electrophysiological recording systems for the brain	47.070	IIS-1546296		0	162,171
E2CDA: Type I: Collaborative Research: Energy Efficient Computing with Chip-Based Photonics	47.070	CCF-1640108		0	158,725
CRISP Type 1: Protecting Coastal Infrastructure in a Changing Climate by Integrating Optimization Modeling and Stakeholder Observations	47.070	OAC-1735609		18,245	157,899
AF:Small:Beyond Worst Case Running time: Algorithms for Routing, Scheduling and Matching	47.070	CCF-1714818		0	156,905
SCH:INT: Large -Scale Probabilistic Phenotyping Applied to Patient Record Summarization	47.070	IIS-1344668		0	156,691
TWC: Medium: Toward Trustworthy Mutable Replay for Security Patches	47.070	CNS-1563555		0	151,480
SCH:INT: Large -Scale Probabilistic Phenotyping Applied to Patient Record Summarization	47.070	IIS-1344668		0	150,800
CRII: ACI: Unveiling the Origin of the Highest Energy Particles in the Universe with Large Scale First Principle Fully Kinetic Simulations	47.070	ACI-1657507		0	148,179
CAREER: New Abstractions for Sensitive Data Management in Modern Operating Systems	47.070	CNS-1351089		0	143,455
CHS: Medium: Collaborative Research: Augmented Reality for Multiple People Perspectives, Platforms, and Tasks	47.070	IIS-1514429		0	139,225
E2CDA: Type I: Collaborative Research: Energy Efficient Computing with Chip-Based Photonics	47.070	CCF-1640108		0	132,580
RAISE: Deep Gravitational Wave Exploration, Instrumental Insights and Noise Removal Through Machine Learning	47.070	CCF-1740391		0	131,855
E2CDA: Type I: Collaborative Research: Energy Efficient Computing with Chip-Based Photonics	47.070	CCF-1640108		0	130,877
TRIPODS: From Foundations to Practice of Data Science and Back	47.070	CCF-1740833		0	127,078
SI2-SSE: Improving Scikit-Learn Usability and Automation	47.070	OAC-1740305		0	126,759
Naturalistic computation and signaling by neural populations in the primate retina	47.070	IIS-1430239		0	125,948
BIGDATA: F: Statistical Foundation of Predictivity: A Novel Architecture for Big Data Learning	47.070	IIS-1741191		0	123,650

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
AF: Small: Collaborative Research: Computational Representations for Design and Fabrication of Developable Surfaces	47.070	CCF-1717268		0	120,606
NeTS: Small: RDMA over Ethernet: A Control Theoretic Approach	47.070	CNS-1618911		0	117,647
CRII: NeTS: High-Performance Scheduling Algorithms for Resource Management in Cloud Networks	47.070	CNS-1565774		0	117,424
III: Medium: Adaptive Information Extraction from Social Media for Actionable Inference in Public Health	47.070	IIS-1563785		0	116,686
AITF: Learning and Adapting Sparse Recovery Algorithms for RF Spectrum Sensing	47.070	CCF-1733857		0	116,665
Integration of Environmental Factors and Causal Reasoning Approaches for Large-Scale Observational Health Research	47.070	IIS 1636832		33,814	114,210
CI-New: Collaborative Research: An Open Platform for Internet Routing Experiments	47.070	CNS-1835252		0	113,569
AF: Medium: Collaborative Research: Circuit Lower Bounds via Projections	47.070	CCF-1563155		0	111,856
AF: Small: Nearest Neighbor Search in High Dimensional Spaces	47.070	CCF-1617955		0	111,337
III: Small: Collaborative Research: Towards Interactive Data Visualization Management Systems	47.070	IIS-1527765		0	108,488
NRI: Collaborative Research: Multimodal Brain Computer Interface for Human Robot Interaction	47.070	IIS-1527747		0	105,980
III: Small: Collaborative Research: Approximate Learning and Inference in Graphical Models	47.070	IIS-1526914		0	105,635
RI: Small: Creating Text-to-Speech Synthesis for Low Resource Languages	47.070	IIS-1717680		0	102,446
NeTS: Small: A Theoretical Approach to MAC Design for Communication Between Low Cost, Ultra Low Power Devices	47.070	CNS-1717867		0	102,001
SaTC: TTP Option: Medium: Scalable Web Transparency: New Scientific Building Blocks, Tools, and Measurements to Tame the Data-Driven Web	47.070	CNS-1514437		0	99,446
CHS: Small: Collaborative Research: Computational Acoustic Design for Digital Manufacturing	47.070	IIS 1816041		0	98,574
BIGDATA: F: Multiaffine Constrained Optimization for High Dimensional Big Data Models	47.070	IIS 1838061		0	94,255
III: Medium: Adaptive Information Extraction from Social Media for Actionable Inference in Public Health	47.070	IIS-1563785		0	93,783
BIGDATA: F: Big Data Analysis via Non-Standard Property Testing	47.070	IIS 1838154		0	91,567
NRI: Collaborative Research: Multimodal Brain Computer Interface for Human Robot Interaction	47.070	IIS-1527747		0	88,712

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Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
WiFiUS: Collaborative Research: Scaling, Securing and Validating Massive Heterogeneous IoT Systems	47.070	CNS-1702952		0	(Includes Subrecipients) 86,062
SHF: Small: Rethinking CAD for System-Level Design via Interactivity, Learning, and Collaboration	47.070	CCF-1527821		0	85,608
SaTC: CORE: Medium: Collaborative: Towards Trustworthy Deep Neural Network Based Al: A Systems Approach	47.070	CNS 1801426		0	85,223
TWC: Small: Collaborative: Automated Detection and Repair of Error Handling Bugs in SSL/TLS Implementations	47.070	CNS 1617670		0	84,516
SHF: Medium: Compiling Parallel Algorithms to Memory Systems	47.070	CCF-1162124		0	83,379
CAREER: Routing for the Emerging Topologies of Modern Internet Services	47.070	CNS 1836872		0	82,968
AF: Medium: New Frontiers in Equilibrium Computation	47.070	CCF-1703925		0	82,152
EAGER: Tagging and Browsing Videos According to the Preferences of Differing Affinity Groups	47.070	IIS 1841670		0	81,121
NRI: Active Tendon-driven Orthosis for Prehensile Manipulation after Stroke	47.070	IIS-1526960		0	80,809
AF: Medium: New Frontiers in Equilibrium Computation	47.070	CCF-1703925		0	80,484
TWC: Medium: Collaborative: Efficient Repair of Learning Systems via Machine Unlearning	47.070	CNS-1564055		0	80,072
AF: Small: Minimalist cryptography	47.070	CCF-1423306		0	79,283
CAREER: Simulating Nonlinear Audiovisual Dynamics for Simulated Environments and Interactive Applications	47.070	IIS-1453101		0	78,164
E2CDA: Type I: Collaborative Research: Energy Efficient Computing with Chip-Based Photonics	47.070	CCF-1640108		0	76,195
Carer: Banalytics: Behavioral Network Analytics with Data Transparency	47.070	CNS-1254035		0	75,854
CSR: CHS: Medium: Collaborative Research: Improving Pedestrian Safety in Urban Cities using Intelligent Wearable Systems	47.070	CNS-1704899		0	75,766
CRCNS Research Proposal: Collaborative Research: Prioritization of Memory Reactivation for Decision-Making	47.070	IIS-1822619		0	75,320
AF: Medium: Research in Algorithms and Complexity: Total Functions, Games, and the Brain	47.070	CCF-1763970		0	70,260
CSR: NeTS: Medium: Collaborative Research: Cloud Support for Latency-Sensitive Web Services	47.070	CNS-1835253		0	69,667
BIGDATA:F:IA:Robust Convolutional Modeling for Massive-Scale Electron Microscopy Data	47.070	IIS-1546411		0	69,216

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
AF: Small: Collaborative Research: Boolean Function Analysis Meets Stochastic Design	47.070	CCF 1814873		0	67,628
\$12-\$\$1: Collaborative Research: ENKI: Software infrastructure that Enables Knowledge integration for modeling coupled geochemical and geodynamical processes	47.070	ACI-1550337		0	67,507
CSR: CHS: Medium: Collaborative Research: Improving Pedestrian Safety in Urban Cities using Intelligent Wearable Systems	47.070	CNS-1704899		0	65,925
AF: Medium: Research in Algorithms and Complexity: Total Functions, Games, and the Brain	47.070	CCF-1763970		0	65,228
NeTS: Small: A Theoretical Approach to MAC Design for Communication Between Low Cost, Ultra Low Power Devices	47.070	CNS-1717867		0	64,406
RI: Medium: Assessing Speaker and Teacher Effectiveness Through Gestural Analysis, EEG Recordings, and Eye Tracking	47.070	IIS-1513853		0	61,538
CAREER: Unifying Provable Security Techniques for Advanced Cryptographic Systems	47.070	CNS-1552932		0	60,134
CHS: Small: Physically-Based Simulation of Strand-Liquid Interaction	47.070	IIS-1717178		0	59,143
TRIPODS: From Foundations to Practice of Data Science and Back	47.070	CCF-1740833		0	58,858
RAISE: Deep Gravitational Wave Exploration, Instrumental Insights and Noise Removal Through Machine Learning	47.070	CCF-1740391		0	58,040
EAGER: Collaborative Research: Supporting Public Access to Supplemental Scholarly products Generated from Grant Funded Research	47.070	OAC-1649703		0	56,538
III: Medium: Collaborative Research: Composing Interactive Data Visualizations	47.070	IIS 1564049		0	55,016
BIGDATA: Collaborative Research: IA: Hardware and software for spike detection and sorting in massively parallel electrophysiological recording systems for the brain	47.070	IIS-1546296		0	54,901
SaTC: TTP: Small: Easy Email Encryption	47.070	CNS-1717801		0	52,217
TWC: Small A Linux ARM Hypervisor for System Security	47.070	CNS-1422909		0	51,081
SaTC: TTP: Small: Easy Email Encryption	47.070	CNS-1717801		0	49,510
Algorithmic Explorations in Networks, Markets, Evolution, and the Brain	47.070	CCF-1819935		0	49,163
CHS: Small: Physically-Based Simulation of Strand-Liquid Interaction	47.070	IIS-1717178		0	48,213
ÉAGÉR: Finding Semantic Security Bugs with Pseudo Oracle Testing	47.070	CNS 1842456		0	47,255
AITF: Learning and Adapting Sparse Recovery Algorithms for RF Spectrum Sensing	47.070	CCF-1733857		0	46,750

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
CAREER: Addressing Emerging Variability Challenges for Margin-Free VLSI Computing Platform Design	47.070	CCF-1453142		0	45,730
TRIPODS: From Foundations to Practice of Data Science and Back	47.070	CCF-1740833		0	44,478
EAGER: Collaborative Research: Lighting a Dark Fiber Experimental Research Network in Harlem	47.070	CNS-1650685		0	43,475
CSR: Small: Collaborative Research: Overheard at Home Mitigating Overhearing of Continuous Listening Devices	47.070	CNS 1815274		0	42,947
SHF: Medium: Collaborative Research: Decentralized On Chip Infrastructure for Robustness and Portability in Heterogeneous Multicores	47.070	CCF-1764000		0	41,869
SPX: Collaborative Research: Moving Towards Secure and Massive Parallel Computing	47.070	CCF 1822809		0	39,252
EAGER: USBRCCR: Researching Internet Routing Security in the Wild	47.070	CNS-1740883		0	38,756
Collaborative Research: SI2-SSI: Inquiry-Focused Volumetric Data Analysis Across Scientific Domains Sustaining and Expanding the Yt Community	47.070	OAC-1663893		0	37,602
SHF: Small: Preponderance of the Evidence for Behavioral Code Similarities	47.070	CCF 1815494		0	36,577
RI: Medium : Collaborative Research: Write A Classifier: Learning Fine-Grained Visual Classifiers from Text and Images	47.070	IIS-1409257		0	34,732
CAREER: Information Theoretic Methods in Data Structures	47.070	CCF 1844887		0	33,377
SHF: Medium: Collaborative Research: Biocompatible I/O interfaces for robust bioorthogonal molecula computing	47.070	CCF 1763632		0	31,831
TRIPODS: From Foundations to Practice of Data Science and Back	47.070	CCF-1740833		0	30,389
CIF: Small: Massive MIMO for Massive Machine-Type Communication	47.070	CCF-1814803		0	24,614
I-Corps: Integrated Multi-Tissue Human Models for Drug Development	47.070	CNS-1842068		0	22,367
BD Hubs: NORTHEAST: The Northeast Big Data Innovation Hub	47.070	IIS-1550284		0	21,851
RI: Medium: Assessing Speaker and Teacher Effectiveness Through Gestural Analysis, EEG Recordings, and Eye Tracking	47.070	IIS-1513853		20,668	20,668
Molecular Computing in Real Life	47.070	CCF-1518715		0	19,997
S&AS:FND:COLLAB:Unsupervised Rare Event Learning With Applications on Autonomous Vehicles	47.070	IIS 1849280		0	19,969
Symposium on Discrete Algorithms Science (SODA) 2019 Travel Grant	47.070	CCF 1906903		0	14,983

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
A Novel Light-weight Cable-driven Active Leg Exoskeleton (C-ALEX) for training of Human Gait	47.070	IIS-1339666		0	14,509
CHS: Small: Translating Compilers for Visual Computing in Dynamic Languages	47.070	CCF 1936523		0	14,180
BIGDATA:F:IA:Robust Convolutional Modeling for Massive-Scale Electron Microscopy Data	47.070	IIS-1546411		0	14,057
Aging in place through enhancedmobility and social connectedness: An integrated robot and wearable	47.070	IIS-1838725		0	13,746
BD Hubs: NORTHEAST: The Northeast Big Data Innovation Hub	47.070	IIS-1550284		0	12,680
TWC: Medium: Collaborative: Studying journalists to identify requirements for usable, secure, and t	47.070	CNS-1513663		0	12,504
III: small: Database Algorithms for Modern CPU Memory Hierarchies	47.070	IIS-1422488		0	12,317
EAGER: Collaborative Research:Automated Instruction Assistant for Argumentative Essays	47.070	IIS 1847853		0	12,259
Collaborative Research: HDR Elements: Software for a new machine learning based parameterization of moist convection for improved climate and weather prediction using deep learning	47.070	OAC 1835769		0	11,666
WiFiUS: Collaborative Research: Scaling, Securing and Validating Massive Heterogeneous IoT Systems	47.070	CNS-1702952		0	10,114
EAGER: Collaborative Research: Lighting a Dark Fiber Experimental Research Network in Harlem	47.070	CNS-1650685		0	10,105
CAREER: Adaptive Algorithms for Combinatorial Optimization in Stochastic Networks	47.070	CNS-1652115		0	10,004
BIGDATA: F: Big Data Analysis via Non-Standard Property Testing	47.070	IIS 1838154		0	9,819
BIGDATA: Collaborative Research: IA: Hardware and software for spike detection and sorting in massively parallel electrophysiological recording systems for the brain	47.070	IIS-1546296		0	9,339
CRII: CIF: Approximate Message Passing Algorithms for High Dimensional Estimation	47.070	CCF 1849883		0	8,100
SHF: Small: An Asynchronous Network on Chip Methodology for Cost Effective and Fault Tolerant Heterogeneous SoC Architectures	47.070	CCF-1527796		0	7,663
EAGER: Collaborative Research:Automated Instruction Assistant for Argumentative Essays	47.070	IIS 1847853		0	7,600
NRI: Active Tendon-driven Orthosis for Prehensile Manipulation after Stroke	47.070	IIS-1526960		0	7,080
EAGER: Collaborative Research: Combining Community and Clinical Data for Augmenting Influenza Modeling	47.070	NSF 1643623		0	6,959
Collaborative Research: Community Planning for Scalable Cyberinfrastructure to Support Multi-Messenger Astrophysics	47.070	OAC-1841588		0	6,019

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
EAGER: Finding Semantic Security Bugs with Pseudo Oracle Testing	47.070	CNS 1842456		0	5,663
TWC: Small: Virtual Private Social Networks	47.070	CNS-1318415		0	5,597
AF: Student Travel to CCC 2017	47.070	CCF-1724073		0	5,434
Collaborative Research: Framework: Software: NSCI: Enzo for the Exascale Era (Enzo-E)	47.070	OAC-1835509		0	5,389
Student Travel Support for CCC 2018	47.070	CCF-1822097		0	5,275
Translational Data Science Workshop	47.070	IIS 1848988		0	5,222
Molecular Computing in Real Life	47.070	CCF-1518715		0	4,800
AF: Small: Scheduling and Routing: Algorithms with novel cost measures	47.070	CCF-1421161		0	4,375
AF: Small: New Directions in Algorithmic Game Theory	47.070	CCF 1929788		0	4,262
CIF: Small: Structured Signal Modeling via Nonconvex Optimization	47.070	CCF-1527809		0	3,451
BD Hubs: NORTHEAST: The Northeast Big Data Innovation Hub	47.070	IIS-1550284		2,138	3,421
EAGER: Collaborative Research: Lighting a Dark Fiber Experimental Research Network in Harlem	47.070	CNS-1650685		0	3,200
Collaborative Research: Framework: Data: Toward Exascale Community Ocean Circulation Modeling	47.070	OAC-1835778		0	3,144
CHS: Small: Optimizing Human Machine Performance via Neurofeedback and Adaptive Autonomy	47.070	IIS 1816363		0	2,411
Translational Data Science Workshop	47.070	IIS 1848988		0	2,179
EAGER: majorization Methods for Machine Learning	47.070	IIS-1451500		0	1,914
AF: Small: Minimalist cryptography	47.070	CCF-1423306		0	1,776
NRI-Small: Collaborative Research: Assistive Robotics for Grasping and Manipulation using Novel Brain Computer Interfaces	47.070	IIS-1208153		0	1,601
III: Small: Collaborative Research: Towards Interactive Data Visualization Management Systems	47.070	IIS-1527765		0	1,550
RI: Small: Describing Disasters and the Ensuing Personal Toll	47.070	IIS-1422863		0	1,222

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
EAGER: Topic Models for Population Genetics	47.070	CCF-1547120		0	(Includes Subrecipients) 1,205
A Novel Light-weight Cable-driven Active Leg Exoskeleton (C-ALEX) for training of Human Gait	47.070	IIS-1339666		0	1,177
Data Science Leadership Summit	47.070	IIS-1821451		0	910
ACM SIGMOD Conference 2016: Student Activities and Travel Support	47.070	IIS-1607205		0	595
CIF: Small: Structured Signal Modeling via Nonconvex Optimization	47.070	CCF-1527809		0	491
CHS: Medium: Collaborative Research: Computational Design and 3D Printing of Textiles	47.070	IIS-1409286		0	434
CPS: Medium: Collaborative Research: Building Information, Inhabitant, Interaction and Intelligent Integrated Modeling (BI5M)	47.070	CNS-1837022		0	404
Spokes: MEDIUM: NORTHEAST: Collaborative Research: Data Science Foundry: A Collaborative Platform for Computational Social Science	47.070	IIS 1761810		0	121
Symposium on Discrete Algorithms Science (SÓDA) 2018 Travel Grant	47.070	CCF-1807311		0	113
NRI-Small: Collaborative Research: Assistive Robotics for Grasping and Manipulation using Novel Brain Computer Interfaces	47.070	IIS-1208153		0	56
Cybersecurity Risk Conference	47.070	IIS-1748395		0	52
BD Hubs: NORTHEAST: The Northeast Big Data Innovation Hub	47.070	IIS-1550284		0	-12,544
				\$74,865	\$11,532,478
Biological Sciences					
NeuroNex Theory Team: Columbia University Theoretical Neuroscience Center	47.074	DBI-1707398		0	1,028,685
NeuroNex Technology Hub: Live Imaging of the C.elegans Connectome	47.074	DBI-1707401		251,000	515,423
Assignment and Structural Characterization of Uniformly Labled proteins by Solid State NMR	47.074	MCB-1412253		0	290,135
Midbrain electrosensory processing in mormyrid fish: multimodalintegration, recurrent feedback, and cerebellar influence	47.074	IOS 1656354		0	251,406
The Molecular Basis of Cadherin-Mediated Cell Adhesion	47.074	MCB-1412472		0	250,302
A systems Approach to Study Horizontal Acquisition of Regulatory DNA	47.074	MCB-1453219		0	232,319

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					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Why do eukaryotes have two Rad51/RecA family recombinases?	47.074	MCB 1817315		0	194,865
Adaptations for mate choice: perceptual mechanisms in species with highly divergent communication signals	47.074	IOS-1656825		0	187,157
Endocrine, genetic and epigenetic mechanisms of coping with environmental change in tropical birds	47.074	IOS-1656098		0	167,351
Collaborative Research: Tradeoffs Between Specialist and Generalist Strategies for Host Immune Evasion in a Vector-Borne Bacterium	47.074	IOS-1755370		15,555	167,244
CAREER: The Mechanistic Interplay Between Biofilm Metabolism and Morphogenesis	47.074	MCB-1553023		0	113,788
Collaborative Research: Does a transition in nitrogen fixation strategy explain the latitudinal distribution of nitrogen-fixing trees?	47.074	DEB-1457650		35,320	77,980
BRAIN EAGER: A Nanophotonic Platform for Multisite Optical Activation in the Brain	47.074	IOS-1611090		0	69,829
Collaborative: The Digital Fruit Fly Brain	47.074	DBI-1544383		0	60,560
A NEIGHBORHOOD APPROACH TO THE BIOGEOGRAPHY OF PUERTO RICAN TREES	47.074	DEB-1753810		0	60,333
Meeting: Coordinating Global Brain Projects, Rockefeller University, September 19th, 2016	47.074	DBI-1644405		0	54,732
RAPID: Hurricane Maria: ASSESSING LANDSCAPE RESILIENCE TO A CHANGING DISTURBANCE REGIME	47.074	DEB-1801315		0	50,294
BRAIN ÉAGÉR: A Nanophotonic Platform for Multisite Optical Activation in the Brain	47.074	IOS-1611090		44,981	50,179
NeuroNex Theory Team: Columbia University Theoretical Neuroscience Center	47.074	DBI-1707398		0	49,278
Large-Scale CMOS electrochemical imagers for the study of metaboilites in multicellular films	47.074	DBI-1353553		0	48,476
Collaborative Research: An Integrated Approach Towards Understanding Iron Uptake in Marine Eukaryotic Phytoplankton	47.074	IOS-1558030		0	47,756
Towards development of the structural determinants of the Glutamate receptor gating regulation by auxiliary membrane anchored proteins	47.074	MCB 1818086		0	44,453
Meeting: Coordinating Global Brain Projects, Rockefeller University, September 19th, 2016	47.074	DBI-1644405		0	43,157
Collaborative Research: Nucleation of Calcium phosphate biomaterials	47.074	DMR-1608554		0	36,971
NSF INCLUDES Early Engagement in Research: key to long-term STEM retention	47.074	DBI-1649310		0	25,061
RAPID: Hurricane Maria: ASSESSING LANDSCAPE RESILIENCE TO A CHANGING DISTURBANCE REGIME	47.074	DEB-1801315		0	24,570

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					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Constraining the Relationship Between Vegetation Change and Net Carbon Sequestration in Arctic and Boreal Peatlands	47.074	DEB-1557078		0	17,370
NSF INCLUDES Early Engagement in Research: key to long-term STEM retention	47.074	DBI-1649310		0	8,193
				\$346,856	\$4,167,867
Social, Behavioral, and Economic Sciences					
The Effects of Federal Indirect Cost Recovery Policy on Academic Institutions	47.075	NSF 1735413		111,296	220,892
CRED Renewal: Center for Research on Environmental Decisions - Understanding and Improving Environmental Decisions	47.075	SES-1463122		0	202,953
Unemployment Insurance Schemes in Developing Countries	47.075	SES-1757105		0	163,153
CRCNS Research Proposal: US German Collaboration: Roles of Place and Grid Cells and Phase Precession in Human Spatial and Episodic Memory	47.075	BCS-1724243		33,094	148,280
Collaborative Research: Models and Analyses of Industrial Laboratories: Returns, Risks, and Structural Efficiency, with Implications for Sustainability and Science Policy	47.075	SMA-01360189		0	133,174
RIDIR: Collaborative Research: Computational and Historical Resources on Nations and Organizations for the Social Sciences (CHRONOS)	47.075	SMA-1637159		0	125,344
Collaborative Research: Market Based Emissions Policies	47.075	SES-1658929		0	121,345
Visual Perception as Retrospective Bayesian Decoding from High- to Low-level Features in Working Memory	47.075	BCS 1754211		0	113,152
Structural Changes in High Dimensional Factor Models	47.075	SES-1658770		0	96,515
Educating Young Researchers in Environment Ethics	47.075	SES-1635656		0	85,500
Standard Grant: The Role of Craft Skill in Scientific Practice	47.075	SES-1734596		0	74,469
CAREER: How Memory Contributes to Goal-Directed Attention	47.075	BCS-1844241		0	68,673
Using Metacognitive Biases to Induce Curiosity and Improve Learning	47.075	BCS-1824193		0	55,238
Standard Research Grant: ToxicDocs Research Infrastructure Project	47.075	NSF 1827951		0	54,194
Dynamic Pricing and Matching with Asymmetric Information	47.075	SES-1824328		0	51,422
Understanding and improving environmental decisions	47.075	SES-0951516		50,298	50,298

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<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Studies on the Data-Driven Economy and School Choice	47.075	SES-1851821		0	35,674
Collaborative Research: Multilevel Regression and Poststrattifcation: A United Framework for Survey Weighted Interface	47.075	SES-1534414		0	27,750
Collaborative Research: Testing the Orbital Theory of Ice Ages using glacial deposits in southern South America and numerical modeling	47.075	BCS-1263474		0	21,011
Doctoral Dissertation Research: The Direct and Indirect Effect of Innovation Subsidies	47.075	SMA-1829326		0	13,608
A Study of Transformations in City Governance Due to the Use of Big Data Analytics	47.075	SES-1754594		0	11,504
Collaborative Research Reassessing the settlement history of the Faroe Islands using lipid biomarkers and environmental genomics	47.075	BCS-1623595		0	11,369
Non-Standard Issues in Regression Discontinuity Designs	47.075	SES-1559058		0	9,600
Doctoral Dissertation Research: Race, Achievment and Trust in Student-Teacher Relationships	47.075	SES-1702651		0	8,899
Topics in Analysis of Big Data and Complex Models	47.075	SES-1558623		0	8,747
The Boston Reentry Study: Analysis and Preparation of Public Use Data	47.075	SES-1762486		0	7,694
Doctoral Dissertation Research: Formation of Ethnoracial Identity	47.075	SES-1802599		0	7,513
Doctoral Dissertation Research: Recovering the Polyvalent Genealogies of Machine Learning, 1948 - 2017	47.075	SMA-1829357		0	7,226
Doctoral Dissertation Research: The Autonomy of Adults with Developmental Disabilities	47.075	SES-1802591		0	6,613
Collaborative Research: Pennsylvania Solitary Confinement Study	47.075	SES-1823846		0	5,168
Doctoral Dissertation Research in Economics: Attention and Beliefs in Games: an Experiment	47.075	SES-1730399		0	4,864
The Emergence of Symbolic Notation and Data Visualization in Algebra and Chemistry	47.075	SES-1754788		0	4,274
Doctoral Dissertation Research: Intergenerational Transmission of Status in New Immigrant Families	47.075	SES-1738696		0	2,965
Doctoral Dissertation: Dispossession and Agrarian Politics	47.075	BCS-1658469		0	2,865
A Study Into the Effect of Employment Conditions Upon Judicial Behavior and Performance	47.075	SES-1260875		0	2,772
Doctoral Dissertation Research: Forest Engineers, Bureaucrats, and the Constitution of Information	47.075	BCS-1823929		0	1,920

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Doctoral Dissertation Research: Making Democracy Work for Women: Gender Gaps in Political Participation and Representation	47.075	SES-1647357		0	1,545
Matching Theory and College Admissions	47.075	SES-1260937		0	1,200
CAREER:Interdealer Networks and the Distribution of Credit Risk	47.075	SES-1555155		0	1,067
Doctoral Dissertation Research: An Ethnographic and Historical Study of Therapeutic Communities	47.075	BCS-1729646		0	422
Educating Young Researchers in Environment Ethics	47.075	SES-1635656		0	98
The Role of Tacit Knowledge in Scientific Experimentation	47.075	SES-1430843		0	4
The Dynamics of Controversial Practices: SEC Sunshine, Aspirational Pay, and the Evolution of Executive Compensation Networks	47.075	SES-1359666		0	-1
Understanding and improving environmental decisions	47.075	SES-0951516		0	-5,120
				\$194,688	\$1,965,853
Education and Human Resources					
NSF Graduate Research Fellow Program	47.076	DGE-1644869		0	5,579,777
Collaborative Research: DRK-12: High School Students Climate Literacy Through Epistemology of Scientific Modeling	47.076	DRL-1719872		0	94,869
IGERT: Engineering Photons for a Sustainable Future	47.076	DGE-1069240		0	92,880
Exploring STEM Impact and Engagement in Student-Led and Purpose-Driven Projects	47.076	DRL-1759299		0	45,695
CCEP-II:Polar learning and responding polar climate educationpartnership	47.076	DUE-1239783		949	24,982
Collaborative Research: Developing a Visualization Framework for Chemical Reactions	47.076	DUE-1525475		0	23,403
CCEP-II:Polar learning and responding polar climate educationpartnership	47.076	DUE-1239783		0	13,848
Exploring STEM Impact and Engagement in Student-Led and Purpose-Driven Projects	47.076	DRL-1759299		0	13,543
Exploring STEM Impact and Engagement in Student-Led and Purpose-Driven Projects	47.076	DRL-1759299		0	11,223
Exploring STEM Impact and Engagement in Student-Led and Purpose-Driven Projects	47.076	DRL-1759299		0	9,999

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Fodoral Crantor / Door through Crantor	0504				R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
IGERT: Engineering Photons for a Sustainable Future	47.076	DGE-1069240		0	5,67
Collaborative Research: Developing a Visualization Framework for Chemical Reactions	47.076	DUE-1525475		0	1,67
				\$949	\$5,917,564
Polar Programs					
Geophysical constraints on the crust and upper-mantle structure of Greenland	47.078	OPP-1304346		0	117,22
Laboratory study of ice deformation under tidal loading conditions with application to Antarctic glaciers	47.078	PLR-1245871		0	-4
				\$0	\$117,179
Office of International Science and Engineering					
Life on a Tectonically Active Delta: Convergence of Earth Science and Geohazard Research in Bangladesh with Education and Capacity Building	47.079	OISE-0968354		4,398	12,24
				\$4,398	\$12,24
Total Direct Award Programs				\$8,699,230	\$86,150,064
Pass-through Awards					
Engineering					
SRN: Integrated Urban Infrastructure Solutions for Environmentally Sustainable, Healthy and Livable Cities	47.041	UMINN A0005261801	CBET-1444745	0	314,49
Nanosytems Engineering Research Center for Directed Multiscale Assembly of Cellular Metamaterials with Nanoscale Precision:CELL-MET	47.041	BU 4500002846	EEC-1647837	0	220,03
Mid-Infrared Topological Plasmon-Polaritons with 2D Materials	47.041	UMINN A006382202	EFMA-1741660	0	160,27
Mid-Infrared Topological Plasmon-Polaritons with 2D Materials	47.041	UMINN A006382202	EFMA-1741660	0	120,07
EFRI NewLAW: New frontiers for topologically-protected propagation of light, sound, elastic and mechanical waves	47.041	UTA16-000936	EFMA-1641069	0	108,77
Nanosytems Engineering Research Center for Directed Multiscale Assembly of Cellular Metamaterials with Nanoscale Precision:CELL-MET	47.041	BU 4500002846	EEC-1647837	0	92,06
INSPIRE-Intentional Defaults for More Sustainable Infrastructure: Studying Interventions to Alleviate Biases in Upstream, Multi-Stakeholder Decisions	47.041	UV GA11247 155597	CBET-1744246	0	86,82
I-Corps Node (Track 2): New York City Regional Innovation Node (NYCRIN)	47.041	RFCUNY CM00000546-00	IIP-1740622	0	73,29

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
SRN: Integrated Urban Infrastructure Solutions for Environmentally Sustainable, Healthy and Livable Cities	47.041	UMINN A0005261801	CBET-1444745	0	59,186
Development of an Accurate Low-Cost Wearable UV Dosimeter for the General Population	47.041	YOUV CU18-1093	IIP-1746461	0	38,741
NSF Engineering Research Center for Integrated Access Networks (CIAN)	47.041	UA Y503160	EEC-0812072	0	35,189
Mechanopotentiation of Cytoxic T Cell Function	47.041	MSKCC BD521839	PD-14-7479	0	31,679
NSF Engineering Research Center for Integrated Access Networks (CIAN)	47.041	UA Y503160	EEC-0812072	0	16,434
STTR Phase I: Using Mining Waste as a Feedstock for the Production of Chemicals from CO2 with Genetically Engineered Acidithiobacillus Ferrooxidans	47.041	IC CU(1648889)	IIP-1648889	0	14,306
SRN: Integrated Urban Infrastructure Solutions for Environmentally Sustainable, Healthy and Livable Cities	47.041	UMINN A0005261801	CBET-1444745	0	13,057
Mechanopotentiation of Cytoxic T Cell Function	47.041	MSKCC BD521839	PD-14-7479	0	12,990
Natural Hazards Engineering Research Infrastructure: Computational Modeling and Simulation Center	47.041	UCB 00010048	CMMI-1612843	0	8,192
				\$0	\$1,405,604
Mathematical and Physical Sciences					
US ATLAS Operations: Discovery and Measurement at the Energy Frontier	47.049	RFSUNY 76749/1136652/2/R&D/PM	PHY-1624739	0	387,265
ÚŚ ATLAS Operations: Discovery and Measurement at the Energy Frontier	47.049	RFSUNY 76749/1136652/2/R&D/PM	PHY-1624739	0	343,918
ÁTLAS Phase - I Upgrades	47.049	SUNYSB 68790	1345157	0	198,302
ÁTLAS Phase - I Upgrades	47.049	SUNYSB 68790	1345157	0	169,449
US ATLAS Operations: Discovery and Measurement at the Energy Frontier	47.049	RFSUNY 76749/1136652/2/R&D/PM	PHY-1624739	0	103,017
US ATLAS Operations: Discovery and Measurement at the Energy Frontier	47.049	RFSUNY 76749/1136652/2/R&D/PM	PHY-1624739	0	74,175
TeV Astrophysics with the VERITAS Gamma Ray Observatory	47.049	BARNARD CU-1806554	PHY-1806554	0	61,630
NRAO Student Observing Support Award for Julia Gross	47.049	NRAO CU18-3133	AST-1519126	0	34,077
Ü.S. ATLAS Operations: Discovery and Measurement at the Energy Frontier	47.049	RFSUNY 76749/1136652/2M&O	PHY-1624739	0	22,262

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
MRI Consortium: Development of a Wide Field-of-View Camera for the Schwarzschild-Couder Gamma Ray Telescope	47.049	BARNARD CU-1828168	PHY-1828168	0	6,677
Particle Astrophysics at TeV Energies with VERITAS	47.049	BARNARD CU-1505811	NSF-1505811	0	4,109
NRAO Student Observing Support Award to Aliya Babul	47.049	NRAO CU18-3936	AST-1519126	0	3,326
MRI Consortium: Development of Magneto-Ellipsometer for the MET Beamline of the National Synchotron Light Source (NSLS-II), Brookhaven National Laboratory	47.049	NJIT 996996	DMR-1828061	0	1,065
				\$0	\$1,409,272
Geosciences					
Operation of the LDEO Ocean-bottom Seismometer Institutional Instrument Center: Wiens Recovery Costs	47.050	IRIS 57-OMO	OCE-1112722	0	286,140
The impact of the ozone hole on the climate of the Southern Hemisphere	47.050	MIT 5710003465	OCE-1338814	0	253,494
Operation of the LDEO Ocean-bottom Seismometer Institutional Instrument Center: Wiens Recovery Costs	47.050	IRIS 57-OMO	OCE-1112722	0	187,864
Collaborative Research: Global Ocean Repeat Hydrography, Carbon, and Tracer Measurements, 2015-2020	47.050	UCSD 59692302	OCE-1437015	0	140,266
Supporting the Multibeam Sonar Systems of the U.S. Academic Research Fleet: Coordinating Operations to Optimize data Quality	47.050	UNH 15-040	OCE-1524585	0	137,793
FESD Type: VOICE: Volcano, Ocean, Ice, and Carbon Experiments	47.050	HARVARD 130783-5069512	AGS-1338832	0	122,726
Mapping Antarctic Subglacial Water in Three Dimensions with Novel Electromagnetic Techniques	47.050	UCSD 96644852	OPP-1643917	0	100,227
Coupled Model Biases in the Sea Surface Temperature (SST) Distribution of the Global Tropics and Their Influence on Climate Change Projections	47.050	UMAINE UMS-1113	AGS-1650037	0	80,046
EarthCube Building Blocks: Collaborative Proposal: EarthCube Data Discovery Hub	47.050	UCSD 80863331/MP S9001535	IER-1639764	44,172	76,708
FESD Type: VOICE: Volcano, Ocean, Ice, and Carbon Experiments	47.050	HARVARD 130783-5069512	AGS-1338832	0	66,824
Collaborative Research: Management and Implementation of the US GEOTRACES Pacific Meridonal Transect	47.050	SU 61573649-125839	OCE-1657944	0	65,903
Paleoenvironmental Perspectives on Prehistoric Human Settlement of Arctic Norway: Implications for Climate, Age Sea-level, and Land-use changes during the Iron-Age	47.050	WM 714711-712687	PLR-1504270	0	62,552
Collaborative Research: Seasonal Sea Ice Production in the Ross Sea, Antarctica	47.050	UTHSCSA 1000000784	PLR-1341717	0	58,570
NSFPLR-NERC: Processes, Drivers, Predictions: Modeling the Response of Thwaites Glacier Over the Next Century using Ice/Ocean Coupled Models (PROPHET)	47.050	UCI 2018-3563	OPP-1739031	0	57,520

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ederal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures
Collaborative Research EaSM-3: Local and Remote Regional Climate Responses to Regional Forcings from Short-lived Climate Forcers	47.050	UCAR SUBAWD001104	AGS-1419571	0	(Includes Subrecipients) 52,873
Collaborative Research: Modeling Ice-ocean Interaction for the Rapidly Evolving Ice Shelf Cavities of Pine Island and Thwaites Glaciers, Antarctica	47.050	UWASH UWSC9918	OCE-1643285	0	49,33
Ocean Sciences for Rural Communities via Informal Science Education: Pop-Up/Drill Down Science	47.050	COL SA16-35	DRL-1515856	0	32,64
Coupled Model Biases in the Sea Surface Temperature (SST) Distribution of the Global Tropics and Their Influence on Climate Change Projections	47.050	UMAINE UMS-1113	AGS-1650037	0	27,83
Alaska Amphibious Community Seismic Experiment	47.050	CU 80572-10908	OCE-1654568	0	19,829
LDEO Operation of Continuous GNSS Stations in Russia	47.050	IRIS SU-19-1001-01-LDEO	EAR-1724509	0	18,251
CNH-L: Volcanism, Hydrology and Social Conflict: Lessons from Hellenistic and Roman-Era Egypt and Mesopotamia	47.050	YU GR104087(CON-80001396)	ICER-1824770	0	16,896
NSF-NERC: Stability and Instability of Records of External Drivers and Resulting Past Behavior of Thwaites Glacier	47.050	HOUSTN R-18-0061	OPP-1738942	0	14,456
Resolving CO2 System Seasonality in the West Antarctic Peninsula with Autonomous Observations	47.050	WM 720002-712683	PLR-1543380	0	12,206
Testing the Fidelity of Nd Isotopes as a Paleo-circulation Tracer in the Southeast Indian-Southern Ocean	47.050	CSUB GRA3575	OCE-1811798	0	11,377
FESD Type: VOICE: Volcano, Ocean, Ice, and Carbon Experiments	47.050	HARVARD 130783-5069512	AGS-1338832	0	7,961
NSFPLR-NERC The Future of the Thwaites Glacier and its Contribution to Sea-Level Rise Science	47.050	UCOL 1556529	OPP-1738913	0	7,202
Operation of the LDEO Ocean-bottom Seismometer Institutional Instrument Center: Wiens Recovery Costs	47.050	IRIS 57-OMO	OCE-1112722	0	4,474
Operation, Densification and Upgrade of Continuous GPS Stations in Russia in the Framework of MOU be	47.050	IRIS 01-Columbia-SAGE	EAR-1261681	0	2,323
NSFPLR-NERC: Ground Geophysics Survey of Thwaites Glacier	47.050	PSU 5861-CU-NSF-8934	OPP-1738934	0	1,358
Operation of the LDEO Ocean-bottom Seismometer Institutional Instrument Center: Wiens Recovery Costs	47.050	IRIS 57-OMO	OCE-1112722	0	750
Collaborative Research: Global Ocean Repeat Hydrography Carbon & Tracer Measurements, 2015-2020	47.050	UWASH UWSC8202	OCE-1433922	0	612
Student Participation in P2 Leg 2, CLIVAR/CO2 repeat Hydrography Program	47.050	UCSD 39019777	OCE-075290	0	-14
				\$44,172	\$1,976,994

**Computer and Information Science and Engineering** 

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
PAWR Platform Full Proposal-COSMOS: Cloud-Enhanced Open Software-Defined Mobile-Wireless Testbed for City-Scale Deployment	47.070	RUTGER 0425	CNS-1827923	41,083	(Includes Subrecipients) 290,631
PAWR Platform Full Proposal-COSMOS: Cloud-Enhanced Open Software-Defined Mobile-Wireless Testbed for City-Scale Deployment	47.070	RUTGER 0425	CNS-1827923	32,037	236,726
NeTS: Large: Collaborative Research: Programmable Inter-Domain Observation and Control	47.070	USC 101503073	CNS-1413978	0	208,071
PAWR Platform Full Proposal-COSMOS: Cloud-Enhanced Open Software-Defined Mobile-Wireless Testbed for City-Scale Deployment	47.070	RUTGER 0425	CNS-1827923	6,469	98,224
NRI: Deep Learning UAVS for High-Throughput Agricultural Disease Phenotyping	47.070	CU 74852-10552	IIS-1527232	0	76,351
Sustained-Petascale In Action: Blue Waters Enabling Transformative Science and Engineering	47.070	UIL 067846-16999	OAC-1238993	0	50,000
ASCENT: Advancing Computer Science Careers Through Enhanced Networking and Training. A Proposal for the Implementation of BEst Practices int he Computer Science and Engineering Postdoc in New York Cit	47.070	CRA POSTDOC003	CCF-1136996	9,849	41,103
SPX: Integrating Persistent Memory in the Cloud	47.070	UV GA11375.160517	CCF-1822965	0	18,424
				\$89,438	\$1,019,530
Biological Sciences					
IOS EDGE: Taking Electric Fish Research to the EDGE with GeneManipulation Technologies	47.074	MSU RC107432A	IOS 1644965	0	99,483
Collaborative Research: Replicated evolution of leaf form in a neo-tropical radiation of Viburnum (Adoxaceae)	47.074	YU GR101994(CON-80001132)	DEB-1557059	0	47,007
CRCNS Research Project: Solving the Neural Code of Hydra	47.074	UWASH UWSC10704	EF-1822550	0	39,645
LTER5B Understanding Environmental Change in Northwest Puerto Rico	47.074	UPRRP 2016-004	DEB-1546686	0	34,124
LTER5B Understanding Environmental Change in Northwest Puerto Rico	47.074	UPRRP 2016-004	DEB-1546686	0	2,200
				\$0	\$222,459
Social, Behavioral, and Economic Sciences					
Collaborative Research: INFEWS/T1: Understanding Multi-Scale Resilience Options for Climate-Vulnerable Africa	47.075	JHU 2003204180	BCS-1639214	0	85,343
RIDIR: Analytical Tools for Text Based Social Data Integration	47.075	UCSD 93934887	SES-1738411	0	40,133
				\$0	\$125,476

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	R&D Cluster  Total Expenditures
Education and Human Resources					(Includes Subrecipients)
Education and numan resources					
Reducing Attrition in STEM Doctoral Education: A Longitudinal Investigation Using Momentary Assessment and Social Psychological Intervention	47.076	PSU 5663-CU-NSF-1214	HRD-1661214	0	84,255
BOP-STEM-C Curriculm and Community Enterprise for New York Harbor Restoration in New York City Public Schools	47.076	PACEU CW2284704	DRL-1440869	0	47,795
InTeGrate: Interdisciplinary Teaching of Geoscience for Sustainable Future	47.076	CARLE CU15-0195	DUE-1125331	0	27,284
Urban Climate Education Partnership	47.076	FRANKLIN CU12-1201	DUE-1239782	0	6,526
Urban Climate Education Partnership	47.076	FRANKLIN CU12-1201	DUE-1239782	0	4,779
BOP-STEM-C Curriculm and Community Enterprise for New York Harbor Restoration in New York City Public Schools	47.076	PACEU CW2284704	DRL-1440869	0	4,632
EL: Computational Thinking in Ecosystems: A-Program-to-Play Approach to Infusing Computational Thinking into Environmental Science Learning	47.076	NYSCI NSF0019-001	DRL-1543144	0	217
				\$0	\$175,488
					, ,
Office of International Science and Engineering					
PIRE: Climate Research Education in the Americas using Tree-Ring and Cave Sediment Examples (PIRE-CREATE)	47.079	SUNYA 18-28-79761	OISE-1743738	0	196,823
PIRE: Climate Research Education in the Americas using Tree-Ring and Cave Sediment Examples (PIRE-CREATE)	47.079	SUNYA 18-28-79761	OISE-1743738	0	127,264
PIRE: Climate Research Education in the Americas using Tree-Ring and Cave Sediment Examples (PIRE-CREATE)	47.079	SUNYA 18-28-79761	OISE-1743738	0	4,305
				\$0	\$328,392
Office of Cyberinfrastructure					
•					
I-Corps Node: New York City Regional Innovation Node (NYCRIN)	47.080	RFCUNY 40D14-A	NSF OIA-1305023	0	158,414
				\$0	\$158,414
Integrative Activities					
PIRE: Dust Simulated Drawdown of Atmospheric CO2 as a Trigger for Northern Hemisphere Glaciation	47.083	ROCHSTR 416748	OISE-1545859	0	122,437
				\$0	\$122,437
Total Pass-through Programs				\$133,610	\$6,944,066
					, ,,, , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

	ear ended June 30, 2019					R&D Cluster
Federal G	Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Total:	National Science Foundation				\$8,832,840	\$93,094,130
Nation	nal Aeronautics & Space Administration					
Direct A	Awards					
NASA -	GODDARD SPACE FLIGHT CENTER					
	ioeconomic Data and Applications Distributed Active Archive Center (DAAC) for the EOS Data and rmation Systems (EOSDIS)	43	80GSFC18C0111		0	4,071,762
	oeconomic Data and Applications Distributed Active Archive Center (DAAC) for the EOS Data and mation Systems (EOSDIS)	43	80GSFC18C0111		0	4,282
Nationa	I Aeronautics & Space Administration					
	occonomic Data and Applications Distrubuted Active Archive Center (DAAC) for the EOS Data and reaction Systems	43	NNG13HQ04C		0	368,595
Astro	oDB Phase 1: Establishing the Foundation of the Astromaterials Data System	43	80NSSC18P3417		0	180,000
NAS	SA Johnson Space Center-Intergovernmental Personnel Agreement (IPA)	43	NASA NNJ19OB06P		0	14,738
	oeconomic Data and Applications Distrubuted Active Archive Center (DAAC) for the EOS Data and mation Systems	43	NNG13HQ04C		0	8,350
					\$0	\$4,647,727
Science	,					
Inter	rdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	1,246,746
High	Resolution Gravity and Measurements for Operation IceBridge Antarctica Campaigns 2016-2019	43.001	NNX16AJ65G		597,820	629,064
Inter	rdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	542,450
Earti	h System Modeling, Comparative Planetary Climatologies and Remote Sensing	43.001	80NSSC18M0133		0	414,405
The	GAPS Experiment: A Search for Dark Matter Using Low Energy Antiprotons and Antideuterons	43.001	NNX17AB44G		0	405,662
Earti	h System Modeling, Comparative Planetary Climatologies and Remote Sensing	43.001	80NSSC18M0133		0	404,508
Earti	h System Modeling, Comparative Planetary Climatologies and Remote Sensing	43.001	80NSSC18M0133		0	362,724

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	OFD 4	D : (N	D	0.1	R&D Cluster
<del></del>	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
High Resolution Gravity and Measurements for Operation IceBridge Antarctica Campaigns 2016-2019	43.001	NNX16AJ65G		0	343,550
Calibration of Density Diagnostic for Solar Physics Using an Electron Beam Ion Trap	43.001	NNX16AF10G		0	274,492
MoonDB Phase 2: Restoration of Lunar Geochronological and Lunar Meteorite Data	43.001	80NSSC18K0514		27,001	265,875
Source Attribution using Satellite Products and Models to Inform Air Quality Planning and Health Accountability	43.001	NNX16AQ20G		89,908	265,698
Desertification or Re-greening:? Adaptation lessons learned in coping with late 20th century drought in West Africa	43.001	NNX16AN29G		0	245,071
Combining Altimetry with Electromagnetic and Regional-climate Models for Improved Estimation of Greenland Ice Sheet Mass Balance	43.001	NNX17AH04G		36,569	226,227
Decision and Information System for the Coastal Waters of Oman (DISCO) - an Integrative tool for Managing Coastal Resources under Changing Climate	43.001	NNX17AG66G		148,909	222,550
Research Scanning Polarimeter (RSP) Team Support for CAMP2Ex	43.001	80NSSC18K0150		0	203,657
Tropical Deciduous Forests of South Asia: Monitoring Degradation and Assessing Impacts of Urbanization	43.001	NNX17AI24G		0	199,194
Analysis of GPM observations to improve our understanding of midlatitude precipitation: A process-oriented study of extratropical cyclones	43.001	NNX16AD82G		88,915	192,034
Towards A Global Flood & Flash Flood Early Warning Early Action System Driven by NASA Earth Observations and Hydrologic Models	43.001	80NSSC18K0342		45,355	179,221
Earth System Modeling, Comparative Planetary Climatologies and Remote Sensing	43.001	80NSSC18M0133		0	171,197
Animals on the move: Remotely based determination of key drivers influencing movements and habitat selection of highly mobile fauna throughout the ABoVE study domain	43.001	NNX15AV92A		16,533	164,268
Biomass burning in the NASA GISS ModelE: uncertainty and interactions between emissions, transport and chemistry	43.001	80NSSC18K0166		0	161,862
Variability and Trends in Tropospheric Oxidation: Interactions with Regional Air Quality, Global Atmospheric Composition, and Climate	43.001	NNX17AG40G		41,658	158,617
Modeling and Observations of Atmospheric Circulation, Cloud, and aerosol processes, Ocean Circulations and Carbon Cycle	43.001	NNX15AJ05A		0	149,289
Tropical Cyclones in the GISS model at High Resolution	43.001	80NSSC17K0196		0	146,801
Activity of Strongly Magnetized Neutron Stars	43.001	NNX17AK37G		0	143,716
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	139,051
The Neutron Star Interior Composition Explorer (NICER)	43.001	NNX17AC28G		0	138,551

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Modeling and Observations of Atmospheric Circulation, Cloud, and aerosol processes, Ocean Circulations and Carbon Cycle	43.001	NNX15AJ05A		36,695	133,505
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	133,395
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	126,151
Modeling and Observations of Atmospheric Circulation, Cloud, and aerosol processes, Ocean Circulations and Carbon Cycle	43.001	NNX15AJ05A		0	125,381
Accretion Disk Outflows from Compact Object Mergers	43.001	NNX16AB30G		0	124,287
Realizing the Full Potential of Weak Lensing Cosmology	43.001	80NSSC18K1093		0	106,203
Multi-source Imaging of Infrastructure and Urban Growth using Landsat, Sentinel and SRTM	43.001	NNX15AT65G		0	106,031
Earth System Modeling, Comparative Planetary Climatologies and Remote Sensing	43.001	80NSSC18M0133		0	102,806
Faint Young Sun Paradoxes and Habitable Worlds: Comparative Climatology of Early Earth and Mars	43.001	NNX15AP16G		0	101,684
Maintenance and Refinement of the NASA SWE Product through AMSR-E Historical Observations	43.001	NNX16AO75G		0	101,464
The Impact of Solar Wind Ions on the Surface and Exosphere of Mercury	43.001	80NSSC18K0521		0	100,652
A Methodology for Optimizing Free Global Climate Model Parameters using NASA Observational Datasets	43.001	NNX17AF46G		0	98,494
Earth System Modeling, Comparative Planetary Climatologies and Remote Sensing	43.001	80NSSC18M0133		0	95,265
The Impact of Cosmic Ray Pressure on Galactic Disk Dynamics and Outflows	43.001	NNX15AB20G		0	90,620
Rocky Planet Habitability: Insights from Solar System Climate Dynamics Through Time	43.001	NNX15AK95G		0	90,563
The GAPS Experiment: A Search for Dark Matter Using Low Energy Antiprotons and Antideuterons	43.001	NNX17AB44G		0	88,559
Population and Infrastructure on Our Human Planet: Supporting Sustainable Development through Improved Spatial Data and Models for Human Settlements, Infrastructure and Population Distribution Based o	43.001	80NSSC18K0328		18,176	88,296
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	87,786
Dynamics and Rates of Tidal Disruption Events	43.001	NNX17AK43G		0	85,600
Goldstone Bosons & Broken Symetries in Cosmology	43.001	NNX16AB27G		0	82,964

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Subpolar N. Atlantic air-sea fluxes associated with mid-latitude cyclones and their effect on AMOC	43.001	NNX16AC93G		0	82,746
Atmospheric Tomography Experiment (ÁTom)	43.001	NNX15AG58A		0	82,366
Self-Consistent Models for Primordial Star-Formation and Reionization	43.001	NNX15AB19G		0	80,095
4-D AEROSOLS: occurrence, type and evolution study using the GISS-E2 model and space/ground based observation	43.001	NNX15AE36G		0	79,877
Fireball-2: Trailblazing Observations of the Space UV Circumgalactic Medium	43.001	NNX17AC54G		0	77,491
NuSTAR Observation of Polars - Probing the X-ray Point Source Population in the Galactic Ridge	43.001	80NSSC18K1647		0	77,241
80191, Observing PSR J2032+4127, A BE Gamma-Ray Binary at Periastron	43.001	80NSSC18K0402		0	70,577
Enhancements to the Global Wildfire Fire Information System: Fire Danger Rating and Applications in Indonesia	43.001	80NSSC18K0410		0	63,365
Subpolar N. Atlantic air-sea fluxes associated with mid-latitude cyclones and their effect on AMOC	43.001	NNX16AC93G		60,946	60,946
Probing the Magnetic Structure of Young Neutron Stars	43.001	NNX16AF30G		0	60,845
Connecting Earth Observations to Decision Makers for Preparedness ActionS	43.001	80NSSC18K1693		0	60,219
Bayesian integration of multiple geodetic data types for investigation of the coupled impact of climate change on Earth systems	43.001	NNX14AP33G		0	58,724
Atmospheric Tomography Experiment (ATom)	43.001	NNX15AG58A		0	56,587
Fireball-2: Trailblazing Observations of the Space UV Circumgalactic Medium	43.001	NNX17AC54G		0	56,129
A Multi-Satellite Observational Analysis and CMIP6 Climate Model Evaluation of the Evolution of Clouds, Moisture and Precipitation on Sub-Daily to Intraseasonal Timescales	43.001	80NSSC18K1030		0	55,977
Uncovering the population of compact supermassive black hole binaries	43.001	NNX17AL82G		0	55,398
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	54,895
Desertification or Re-greening:? Adaptation lessons learned in coping with late 20th century drought in West Africa	43.001	NNX16AN29G		0	53,358
Particle Acceleration at Radiative Shocks in Gamma-Ray Novae	43.001	80NSSC18K1708		0	52,057
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	51,916

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Modeling and Observations of Atmospheric Circulation, Cloud, and aerosol processes, Ocean Circulations and Carbon Cycle	43.001	NNX15AJ05A		0	50,646
16-NUSTAR16-0020, The Transformative Young Pulsar J1846-0258 in SNR Kes 75	43.001	80NSSC17K0636		0	49,226
Remote Sensing Estimate of Evapotranspiration Partitioning to Transpiration	43.001	80NSSC18K0998		0	48,503
Radiative transfer in gamma-ray bursts	43.001	NNX15AE26G		0	45,091
Variability in the Tropical Upper Troposphere/Lower Stratosphere from Sub-Seasonal to Inter-Annual Timescales - Student: Zane Martin	43.001	80NSSC18K1347		0	44,674
Using Multi-Satellite Observations to Analyze Ground-Level Ozone Sensitivity to NOx and VOC Precursor Emissions, from Urban to Global Scales	43.001	80NSSC18K1399		0	44,413
Attributing the Causes of a Century of Wetting in the Eastern United States Using Observations, Models, and Tree Rings	43.001	80NSSC17K0402		0	44,287
A Framework for the Validation of Global Nighttime Environmental Products	43.001	80NSSC18K0795		0	44,123
An Examination of Midlatitude Frontal Systems in NASA Models and Observations	43.001	80NSSC17K0195		0	43,863
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	42,828
Earth System Modeling, Comparative Planetary Climatologies and Remote Sensing	43.001	80NSSC18M0133		0	42,477
Observations of biosphere-atmosphere interactions using satellite data	43.001	NNX16AO16H		0	42,147
Response of the Indian Ocean to Indonesian Throughflow Variability	43.001	80NSSC17K0438		0	41,544
Quantifying Process-based Variability and Uncertainties in Ocean, Land, and Atmosphere Forcing of Extra-tropical Droughts and Heat Waves in GISS Model E and Observations	43.001	80NSSC17K0265		0	40,856
Quantifying Process-based Variability and Uncertainties in Ocean, Land, and Atmosphere Forcing of Extra-tropical Droughts and Heat Waves in GISS Model E and Observations	43.001	80NSSC17K0265		0	40,564
Glacier Changes in High Mountain Asia since 1970 - Combining Declassified Spy Satellite Imagery with Energy and Mass Balance Models	43.001	NNX16AO59H		0	40,000
Modeling and Observations of Atmospheric Circulation, Cloud, and aerosol processes, Ocean Circulations and Carbon Cycle	43.001	NNX15AJ05A		0	39,933
Interdisciplinary Research on Earth System Modeling and the Impacts of Climate Change	43.001	80NSSC17M0057		0	39,127
Measuring and Modeling the Response of the Solid Earth to Changes in the Cryosphere and the Earthquake Cycle in Southern Alaska	43.001	NNX16AK86G		0	39,027
A Snapshot Survey of the Hyades: Testing Models for Magnetic Saturation	43.001	NNX17AD71G		0	38,922

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Understanding and Quantifying the Links between Ice Sheet and Glacial Albedo, Surface Mass Balance and Atmospheric Fluxes through Improved NASA GISS-E2 Simulations	43.001	80NSSC17K0351		0	38,497
The Impact of Solar Wind Ions on the Surface and Exosphere of Mercury	43.001	80NSSC18K0521		1,573	38,145
Why We Should Keep Poking the Beehive: Simultaneous K2 and Spectroscopic Observations of Praesepe	43.001	80NSSC18K0448		0	34,918
A Decade On, Which Bees are Still Buzzing? Monitoring Starspot Evolution in Praesepe from PTF to K2	43.001	80NSSC19K0114		0	33,877
Advancing Total Tomography for Study of Earth's Interior	43.001	NNX17AD97G		0	28,626
Why So Much Shell Burning on the White Dwarfs in Wide Binaries?	43.001	NNX17AD94G		0	25,793
No Longer on the Margins: Completing the Rotational Census of Low-Mass Hyads with TESS	43.001	80NSSC19K0383		0	25,739
How the Other Half Lives: Completing the K2 Census of Low-Mass Hyads	43.001	NNX17AF73G		0	24,882
The Impact of Organic Aerosol Volatility on Aerosol Microphysics for Global Climate Modeling Applications	43.001	80NSSC18K0184		0	24,645
Total Carbon Estimation in Coastal and Freshwater Peatland Forests	43.001	80NSSC18K0469		0	24,470
Searching for Infant Exoplanets in Young Moving Groups	43.001	80NSSC19K0636		0	21,218
Science and Calibration Support for the Reflection Grating Spectrometer on the XMM-Newton Observatory	43.001	80NSSC18K1438		0	18,318
Unsolicited, Possible Magnetic Field Break-out in the Neutron Star CCO 1E 1207.4-5209	43.001	80NSSC18K0452		0	17,780
SU LYN: A Hard X-Ray Bright Symbiotic Star Hiding in Plain Sight	43.001	NNX17AC45G		0	16,870
Desertification or Re-greening:? Adaptation lessons learned in coping with late 20th century drought in West Africa	43.001	NNX16AN29G		0	15,836
The Impact of Solar Wind Ions on the Surface and Exosphere of Mercury	43.001	80NSSC18K0521		0	15,148
16-SWIFT 16-0015, Testing the Origin of Periodic Variability for the Binary Candidate Quasar PG1302-102	43.001	80NSSC17K0311		0	14,760
Start up Funds for Early Career Researcher	43.001	NNX17AH08G		0	13,757
Birth and Infancy of a Fast Radio Burst	43.001	80NSSC18K1104		0	11,593
Synergistic ice cloud observations from eMAS and RSP	43.001	NNX15AD44G		6,824	10,958

	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures
43.001	80NSSC17M0057		0	(Includes Subrecipients) 10,029
43.001	80NSSC19K0149		0	9,578
43.001	NNX16AR14G		0	7,922
43.001	NNX16AD40G		0	7,618
43.001	NNX15AN27H		0	6,254
43.001	80NSSC17K0632		0	5,429
43.001	80NSSC17K0501		0	4,992
43.001	80NSSC17M0057		0	4,721
43.001	NNX13AN57H		0	3,929
43.001	80NSSC18K0378		0	2,970
43.001	80NSSC17K0193		0	2,529
43.001	NNX15AN69H		0	1,421
43.001	NNX13AI29A		0	1,252
43.001	NNX14AM38G		0	368
43.001	NNX15AR85H		0	328
43.001	NNX14AD48G		-637	-637
43.001	NNX16AE37G		0	-3,826
			\$1,216,245	\$12,739,953
el 43.003	NNX16AR81A		0	355,900
4	43.001  43.001  43.001  43.001  43.001  43.001  43.001  43.001  43.001  43.001  43.001  43.001  43.001	43.001 80NSSC19K0149  43.001 NNX16AR14G  43.001 NNX16AD40G  43.001 NNX15AN27H  43.001 80NSSC17K0632  43.001 80NSSC17K0501  43.001 80NSSC17M0057  43.001 NNX13AN57H  43.001 80NSSC18K0378  43.001 80NSSC17K0193  43.001 NNX15AN69H  43.001 NNX15AN69H  43.001 NNX14AM38G  43.001 NNX15AR85H  43.001 NNX15AR85H  43.001 NNX14AD48G	43.001 80NSSC19K0149  43.001 NNX16AR14G  43.001 NNX16AD40G  43.001 NNX15AN27H  43.001 80NSSC17K0632  43.001 80NSSC17K0501  43.001 80NSSC17M0057  43.001 NNX13AN57H  43.001 80NSSC18K0378  43.001 80NSSC17K0193  43.001 NNX15AN69H  43.001 NNX15AN69H  43.001 NNX14AM38G  43.001 NNX14AM38G	43.001 80NSSC19K0149 0  43.001 NNX16AR14G 0  43.001 NNX16AD40G 0  43.001 NNX15AN27H 0  43.001 80NSSC17K0632 0  43.001 80NSSC17K0501 0  43.001 80NSSC17K0501 0  43.001 NNX13AN57H 0  43.001 NNX13AN57H 0  43.001 NNX13AN57H 0  43.001 NNX13AN57H 0  43.001 NNX15AN89H 0  43.001 NNX15AN89H 0  43.001 NNX15AN89H 0  43.001 NNX15AN89H 0  43.001 NNX14AM38G 0  43.001 NNX14AM38G 0  43.001 NNX14AR85H 0  43.001 NNX14ABG 4637

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Combined effects of Space Radiation and Microgravity on the function of human capillaries and the endothelial barrier: Implications for degenerative disorders	43.003	NNX14AR22G		0	(Includes Subrecipients) 79,239
A Determination of Bioactive Proteins Secreted by the Human Vasculature in Response to Low Dose Space Radiation	43.003	80NSSC18K1492		0	38,248
A Determination of Bioactive Proteins Secreted by the Human Vasculature in Response to Low Dose Space Radiation	43.003	80NSSC18K1492		0	69
				\$0	\$473,456
Cross Agency Support					
BioWires: DNA-based nanowires for conductivity-enhanced, self- assembling nanoelectronics	43.009	NNX14AM51H		0	4,537
				\$0	\$4,537
Space Technology					
Versatile Manipulation for Assistive Free-Flyers	43.012	NNX16AD13G		0	244,725
Ultra-Low Power CMOS-comparible Integrated Photonic Platform for Terabit-Scale Communications	43.012	NNX16AD16G		0	141,108
Ultra-Low Power CMOS-comparible Integrated Photonic Platform for Terabit-Scale Communications	43.012	NNX16AD16G		0	129,231
				\$0	\$515,064
Total Direct Award Programs				\$1,216,245	\$18,380,737
Pass-through Awards					
National Aeronautics & Space Administration					
Operation, Densification, and Upgrade of Continuous GNSS Stations in Russia in the Framework of MOU between LDEO & JPL	43	JPLCIT 1452786	NAS7-03001	112,804	187,685
Columbia University Participation in The Nuclear Spectroscopic Telescope Array (NuSTAR): Bringing the High Energy Universe Into Focus (Bridge Phase)	43	CALTECH S376760	NNG08FD60C	0	107,755
Einstein Postdoctoral Fellowship for Dr. Eric Coughlin: Black Hole Enlightenment from Tidal Disruption Events	43	SAO PF6-170170	NAS8-03060	0	95,201
The origin of circumgalactic medium: tracing the baryon cycle via synthetic absorption line mapping	43	HST-HF2-51388.001-A	NAS5-26555	0	88,244
Einstein Postdoctoral Fellowship for Dr. Jennifer Barnes:	43	SAO PF7-180162	NAS8-03060	0	87,710
Einstein Postdoctoral Fellowship for Dr. Daniel Siegel: The Transient Electromagnetic Sky from Bina	43	SAO PF6-170159	NAS8-03060	0	69,260

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
A Redback Millisecond Pulsar with Variable Heating	43	SAO GO7-18047X	NAS8-03060	0	(Includes Subrecipients) 53,339
Columbia University Participation in The Nuclear Spectroscopic Telescope Array (NuSTAR): Bringing the High Energy Universe Into Focus (Bridge Phase)	43	CALTECH S376760	NNG08FD60C	0	44,539
À UV Spectroscopic Survey of Periodic M Dwarfs in the Hyades	43	HST-GO-15090.001-A	NAS5-26555	0	31,98
Éinstein Postdoctoral Fellowship for Dr. Eric Coughlin: Black Hole Enlightenment from Tidal Disruption Events	43	SAO PF6-170170	NAS8-03060	0	31,400
Einstein Postdoctoral Fellowship for Dr. Daniel Siegel: The Transient Electromagnetic Sky from Bina	43	SAO PF6-170159	NAS8-03060	0	23,884
Where Have All the Central Compact Objects Gone?	43	SAO G08-19046X	NAS8-03060	0	21,76
Validating the Presence of a Moon Orbiting Kepler-1625b	43	HST-GO-15149.002-A	NAS5-26555	0	17,14
Joint Chandra/VLA Observations of PSR J1023+0038: A Unique Testbed for Accretion and Jet Formation Physics	43	SAO GO6-17034X	NAS8-03060	0	16,01
Target-of-Opportunity Chandra Observations of Magnetars in Outburst	43	SAO GO7-18053X	NAS8-03060	0	15,956
Imaging Spectroscopy of the Gamma-Ray Nova V959 Mon	43	HST-GO-13715.001-A	NAS5-26555	0	15,75
Keck Research Support Agreement	43	JPLCIT 1597191	NASA CU18-0977	0	11,74
The Surprising Ejecta Geometry of Recurrent Nova T Pyx	43	HST-GO-13400.002-A	NAS5-26555	0	11,629
Einstein Postdoctoral Fellowship for Dr. Jennifer Barnes:	43	SAO PF7-180162	NAS8-03060	0	11,52
Gamma-ray Quiet Novae: What Sets the Gamma-Ray Luminosity of Novae?	43	HST-GO-15438.001-A	NAS5-26555	0	11,37
Einstein Postdoctoral Fellowship for Dr. Nicholas Stone:	43	SAO PF5-160145	NAS8-03060	0	11,33
WFIRST Infrared Nearby Galaxy Survey	43	UWASH UWSC9083	NNG16PJ28C	0	11,29
The origin of circumgalactic medium: tracing the baryon cycle via synthetic absorption line mapping	43	HST-HF2-51388.001-A	NAS5-26555	0	11,07
Sensitive Long-Term Timing of CCO Pulsars	43	SAO GO7-18063X	NAS8-03060	0	10,13
Disentangling the Gamma-Ray Emission Towards Cygnus X: Sh2-104	43	SAO GO6-17016X	NAS8-03060	0	7,37
The Role of Shocks in the Appearance and Aftermath of Stellar Mergers and Type IIn Supernovae	43	HST-AR-15041.001-A	NAS5-26555	0	6,90

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Ultraviolet Spectroscopy of the Black Hole Transient MAXI J1820+070	43	HST-GO-15454.002-A	NAS5-26555	0	(Includes Subrecipients) 6,570
Understanding the Angular Momentum Content of Galaxies in Concert with Their Circumgalactic Medium	43	HST-AR-14565.005-A	NAS5-26555	0	5,322
Understanding Galaxy Shapes Across Cosmic Time Using The IllustrisTNG Simulation	43	HST-AR-15022.002-A	NAS5-26555	0	5,27
Coordinated X-Ray and Radio Observations of the Repeating Fast Radio Burst FRB 121102	43	SAO GO7-18059A	NAS8-03060	0	4,938
Kinetic Inductance Detector Arrays for Very Sensitive Millimeter-Wave	43	JPLCIT 1533216	NNN12AA01C	0	3,80
Mapping Gas Flows from the Disk to the Circumgalactic Medium	43	HST-GO-15156.002-A	NAS5-26555	0	1,798
Clusters with K2. Systematics from membership and binarity	43	JPLCIT 1592704	NASA CU18-0487	0	1,57
Einstein Postdoctoral Fellowship for Dr. Nicholas Stone:	43	SAO PF5-160145	NAS8-03060	0	1,294
PSR J2032+4127: A Be / Gamma-Ray Pulsar Binary Heading Toward Periastron	43	SAO GO7-18055X	NAS8-03060	0	432
Kinetic Inductance Detector Arrays for Very Sensitive Millimeter-Wave	43	JPLCIT 1533216	NNN12AA01C	0	-3,808
				\$112,804	\$1,039,218
Science					
LiDAR, Passive Spectral, and Ecophysiological Approaches to link Forest Tundra Ecotone Structure and Function	43.001	UOFIA NS0926-SB1-651954	NNX15AT86A	0	131,339
Fluxes of Heat, Carbon, and Oxygen at SWOT Scales	43.001	NYU F7831-01	NNX16AJ35G	0	112,239
Understanding and Forecasting Changes in High Mountain Asia Snow Hydrology via a Novel Bayesian Reanalysis and Modeling Approach	43.001	UCLA 0135 G VA160	NNX16AQ63G	0	111,230
Computational Technologies: An Assessment of Hybrid Quantum Annealing Through Mission Related Approaches for Inferring and Assimilating Satellite Surface Flux Data into Global Land Surface Models	43.001	UMARY 0000020109	80NSSC17K0285	0	95,18
Improving the Accuracy of Geodetic System Ties at Core Sites through Estimation on Strategies that Exploit Atmospheric Structure	43.001	MIT 24825	NNX17AG98G	0	82,546
Developing a Mechanistic Understanding of Variability in the Atmospheric CO2 Growth Rate owing to Interannual Climate Oscillations	43.001	UMICHG 3004565769	NNX17AK19G	0	59,188
Collaborative Research: Earth Venture Suborbital -2 Oceans Melting Greenland (OMG)	43.001	JPL 1525063	NNN12AA01C	0	57,96
Joint Radar and Model Investigations of Greenland Basal Water Conditions	43.001	SU 61372951-124103	NNX16AJ95G	0	55,187

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Ecological and Sociodemographic Determinants and Impacts of Urbanization and Restoration on Intertwined Urban-Wetland-Estuarine Systems	43.001	CCONY CM00001790-01	80NSSC17K0258	0	(Includes Subrecipients) 43,545
Blazar emission modeling: going beyond the spherical cows	43.001	PURDUNIV 4103-84001	NNX17AG21G	0	37,991
Lunar Impact Melt Flows: Geological Mapping, Experimental Simulation, and Numerical Modeling	43.001	UA 295634	NNX15AL60G	0	25,916
Subcontract: A Peek at the Past of Greenland Ice Sheet using Radar Layers and Modeling	43.001	JPLCIT 1569119	NNH15ZDA001N-CRYO	0	20,271
SLICE: Spectral Signs of Life in Ice	43.001	MONTANA G104-19-W7250	80NSSC18K0814	0	19,029
Testing the efficacy of FAR-UVC light in inactivating bacterial spores, and hardy vegetative cells	43.001	JPLCIT 1622553	NATIONAL AERONAUTICS & SPACE A	0	16,999
Participation in the Effects of Density Fluctuations on Alfven Wave Turbulence in a Coronal Hole Program	43.001	SAO SV9-89006	80NSSC18K1207	0	15,757
Continuation of AMASR-E Earth Science Data Records with JAXA AMSR2	43.001	UOA 2016-044	NNX13AN44GG	0	11,597
Europa STI - Exploring Communication Techniques and Strategies for Sending Signals Through the ICE (STI) for an Ice-Ocean Probe	43.001	JH 155891	80NSSC19K0613	0	11,304
A Multi-Frequency Campaign to Probe Uranus Dynamics and Deep Atmospheric Structure	43.001	UCB 00009673	NNX16AK14G	0	11,282
TREX: Toolbox for Research and Exploration	43.001	PSINST 1523 Columbia Universit	80ARC017M00005	0	8,345
An Examination of the Relationships Between Aerosol, Cloud Vertical Structure, and Cloud Radiative Forcing in Midlatiude Cyclones	43.001	UMICHG 3001568909	NNX10AM20G	0	-197
				\$0	\$926,718
Aeronautics					
Effect of unloading on the structure and mechanics of the rotator cuff tendon-to-bone insertion	43.002	NCC99-58-265	NASA JOHNSON SPACE CENTER	0	-40
				\$0	\$-40
Exploration					
Space radiation and gastrointestinal cancer: A comprehensive strategy for risk assessment and model development	43.003	GU 410967 GR410946-CU-Project	NNX15Al21G	0	79,485
A Mechanistic Framework to Assess the Efficacy of Aspirin and other Radioprotectors to Reduce Carcinogenesis by Space Radiations	43.003	BCMH 7000000517	NNX16A069A	0	31,504
A Mechanistic Framework to Assess the Efficacy of Aspirin and other Radioprotectors to Reduce Carcinogenesis by Space Radiations	43.003	BCMH 7000000517	NNX16A069A	0	20,995

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
miRNA Signature Detection and Countermeasures Against HZE Radiation Exposure for Tissue Degeneration	43.003	BCMH 7000000822	NNX16A069A	0	18,583
				\$0	\$150,567
Education					
NASA / NEW YORK SPACE GRANT CONSORTIUM: NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM 2015-18	43.008	CU 76156-10486	NNX15AK07H	0	23,868
				\$0	\$23,868
Total Pass-through Programs				\$112,804	\$2,140,331
Total: National Aeronautics & Space Administration				\$1,329,049	\$20,521,068
Department of Energy					
Direct Awards					
Brookhaven National Laboratory					
MOU/BNL for Oleg Gang	81	BNL CU16-2135		0	224,539
MOU/BNL for Oleg Gang	81	BNL CU16-2135		0	28,578
Graduate Student Support for Xiong Yan DNA nanostructures to program orientations of organic and inorganic components for tunable synthetic systems	81	BNL 362609		0	20,739
				\$0	\$273,856
Office of Science Financial Assistance Program					
Theoretical High Energy Physics	81.049	DE-SC0011941		0	868,270
Disruption Prediction and Avoidance in High Beta long pulse KSTAR Plasmas	81.049	DE-SC0016614		0	817,965
HIGH BÉTA TOKAMAK RESEARCH	81.049	DE-FG02-86ER53222		0	775,068
Jet and Heavy Flavor Probes of the Quark-Gluon Plasma	81.049	DE-FG02-86ER40281		0	708,405
MAGNETOHYDRODYNAMICS MODE CONTROL RÉSÉARCH IN DIII-D	81.049	DE-FG02-04ER54761		0	596,284
DNA Grafting Building Blocks Designed to Self-Assemble into Desired Nanostructures	81.049	DE-SC0008772		91,285	489,222

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		423,509	454,509
Stability Research for Disruption Prediction and Avoidance in MAST-U Spherical Tokamak Plasmas	81.049	DE-SC0018623		0	419,445
Transient Superconductivity at Nano-and Meso-Scales	81.049	DE-SC0018218		331,222	331,222
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	297,858
STELLARATORY THEORY DESIGN	81.049	DE-FG02-95ER54333		0	270,091
Synthesis of Observed and Simulated Rain Microphysics to Inform a new Bayesian Statistical Framework for Microphysical Parameterization in Climate Models	81.049	DE-SC0016579		218,315	264,379
Fundamental Studies in Basic Plasma Science: Investigations of Alfven Wave Damping Processes Relevant to the Solar Corona	81.049	DE-SC0016602		0	257,982
Structure-property relationship in metal carbides and bimetallic alloys	81.049	DE-SC0009476		0	244,524
Electronic and Photonic Phenomena in Graphene-Based Heterostructures	81.049	DE-SC0018426		0	193,757
Dedicated Beamline Facilities for Catalytic Research: Synchrotron Catalysis Consortium (SCC)	81.049	DE-SC0012653		19,966	186,296
Transient Superconductivity at Nano-and Meso-Scales	81.049	DE-SC0018218		0	173,148
Characterization of oceanic post-cold frontal clouds and their model representation	81.049	DE-SC0016344		146,483	160,061
A new approach to the interacting phonon problem	81.049	DE-SC0016507		0	158,231
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	156,065
Quantum transport in 2D semiconductors	81.049	DE-SC0016703		0	155,621
Transient Superconductivity at Nano-and Meso-Scales	81.049	DE-SC0018218		0	155,545
Charge carrier dynamics in hybrid organic-inorganic semiconductors	81.049	DE-SC0010692		0	154,118
HIGH BETA TOKAMAK RESEARCH	81.049	DE-FG02-86ER53222		0	148,609
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	135,769
Using Crystallization to Control Filler Dispersion and Vice Versa n Polymer Nanocomposites	81.049	DE-SC0018111		0	131,692

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Nonlinear Dynamics of Strong Interchange Instabilities in a Rotating Dipole-Confined Plasma	81.049	DE-FG02-00ER54585		0	(Includes Subrecipients) 131,039
Simulation Center for Runaway Electron Avoidance and Mitigation	81.049	DE-SC0016347		0	130,107
Stability and Control of Burning Tokamak Plasmas with Resistive Walls	81.049	DE-SC0014119		0	127,972
Ab Initio Geochemistry of Hydrous Phases	81.049	DE-SC0019759		0	116,599
Metal Catalyzed Transformations Involving C X Bonds for the Conversions of Carbon Dioxide and Organic Chemicals	81.049	DE-SC0019204		0	113,633
Transient Superconductivity at Nano-and Meso-Scales	81.049	DE-SC0018218		0	111,927
Nanoscale Environments for Catalysis	81.049	DE-SC0019440		0	109,533
Dedicated Beamline Facilities for Catalytic Research: Synchrotron Catalysis Consortium (SCC)	81.049	DE-SC0012653		24,091	105,107
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	103,224
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	84,716
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	82,909
Building a Toolbox of Singlet Fission Molecules for Solar Energy Conversion	81.049	DE-SC0014563		0	75,938
Building a Toolbox of Singlet Fission Molecules for Solar Energy Conversion	81.049	DE-SC0014563		0	70,655
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	60,92
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	59,718
Chemical Kinetic Data of Benchmark Accuracy through Multi-Scale Informatics Strategies	81.049	DE-SC0019487		0	58,90
Catalytic Applications of H Atom Transfer from Transition-Metal Hydride Complexes-04	81.049	DE-FG02-97ER14807		0	58,216
Collaborative Research: Explosive Reconnection in Relativistic Magnetically-Dominated Plasmas	81.049	DE-SC0016542		0	55,674
Building a Toolbox of Singlet Fission Molecules for Solar Energy Conversion	81.049	DE-SC0014563		0	54,836
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	51,240

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	50,735
HIGH BETA TOKAMAK RESEARCH	81.049	DE-FG02-86ER53222		0	39,760
Structure-property relationship in metal carbides and bimetallic alloys	81.049	DE-SC0009476		0	34,764
Cross-Scal Land-Atmosphere Experiment (CSLAEX)	81.049	DE-SC0014203		0	33,739
Simulation Center for Runaway Electron Avoidance and Mitigation	81.049	DE-SC0019479		0	27,606
Ab Initio Geochemistry of Hydrous Phases	81.049	DE-SC0019759		0	25,426
Jet and Heavy Flavor Probes of the Quark-Gluon Plasma	81.049	DE-FG02-86ER40281		0	24,107
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	21,938
Physics and Control of Disruptive Locked Modes at DIII-D	81.049	DE-SC0016372		0	21,384
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	21,185
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	20,341
Fundamental Studies of Metal Centered Transformations Relavant to Catalysis	81.049	DE-FG02-93ER14339		0	15,403
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	14,205
Theoretical High Energy Physics	81.049	DE-SC0011941		0	12,102
Tokamak Disruption Simulation	81.049	DE-SC0018424		0	10,124
Nonlinear Dynamics of Strong Interchange Instabilities in a Rotating Dipole-Confined Plasma	81.049	DE-FG02-00ER54585		0	8,728
Theoretical High Energy Physics	81.049	DE-SC0011941		0	8,292
Understanding Recent Global Hydroclimate Change using Multivariate Detection and Attribution Techniques and GCM Experiments	81.049	DE-SC0014423		0	7,773
Theoretical High Energy Physics	81.049	DE-SC0011941		0	7,418
Theoretical High Energy Physics	81.049	DE-SC0011941		0	6,334

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Catalytic Growth of Molecular-Scale Wiring	81.049	DE-FG02-01ER15264		0	(Includes Subrecipients) 5,907
Theoretical High Energy Physics	81.049	DE-SC0011941		0	5,852
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	5,508
Theoretical High Energy Physics	81.049	DE-SC0011941		0	2,967
Theoretical High Energy Physics	81.049	DE-SC0011941		0	2,285
Programmable Quantum Materials (Pro-QM)	81.049	DE-SC0019443		0	997
Theoretical High Energy Physics	81.049	DE-SC0011941		0	305
MAGNETO HYDRODYNAM STABILITY/ACTIVE MODE CONTROL- OFF CAMPUS THE NATIONAL SPHERICAL TORUS EXPERIMENT	81.049	DE-FG02-99ER54524		0	-2
Fundamental Studies of Metal Centered Transformations Relavant to Catalysis	81.049	DE-FG02-93ER14339		0	-187
Fundamental Studies of Metal Centered Transformations Relavant to Catalysis	81.049	DE-FG02-93ER14339		0	-706
Theoretical High Energy Physics	81.049	DE-SC0011941		0	-1,621
				\$1,254,871	\$10,899,670
Conservation Research and Development					
Reducing plug-load electricity footprint of residential buildings through low-cost, non-intrusive sub-metering and personalized feedback technology	81.086	DE-EE0007684		0	223,630
Reducing plug-load electricity footprint of residential buildings through low-cost, non-intrusive sub-metering and personalized feedback technology	81.086	DE-EE0007684		30,000	169,473
Graded Alloy Quantum Dots for Energy Efficient Solid State Lighting	81.086	DE-EE0007628		55,976	135,933
Reducing plug-load electricity footprint of residential buildings through low-cost, non-intrusive sub-metering and personalized feedback technology	81.086	DE-EE0007684		0	125,537
				\$85,976	\$654,573
Renewable Energy Research and Development					
GIS-based Graphical User Interface Tool for Analysis of Solar Thermal Desalination Systems and High Potential Implementation Regions	81.087	DE-EE0008401		0	294,825

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Cubracinianta	R&D Cluster  Total Expenditures
	CFDA	Project No	Pass-tillough Contract Number	<u>Subrecipients</u>	(Includes Subrecipients)
Comparative Life-Cycle Analysis of Scalable Single-Junction and Tandem Perovskite Solar Cells (PSC) Systems	81.087	DE-EE0008543		0	46,039
GIS-based Graphical User Interface Tool for Analysis of Solar Thermal Desalination Systems and High Potential Implementation Regions	81.087	DE-EE0008401		0	12,714
				\$0	\$353,578
Fossil Energy Research and Development					
Integrated Pre-Feasibility Study for CO2 Geological Storage in the Cascadia Basin: Offshore Washington State and British Columbia	81.089	DE-FE0029219		45,071	114,588
Integrated Pre-Feasibility Study for CO2 Geological Storage in the Cascadia Basin: Offshore Washington State and British Columbia	81.089	DE-FE0029219		0	8,427
				\$45,071	\$123,015
Nuclear Energy Research, Development and Demonstration					
An integrated multiscale experimental-numerical analysis on re-consolication of scale-clay mixure for disposal of heat-generating waste	81.121	DE-NE0008534		0	310,059
				\$0	\$310,059
Advanced Research Projects Agency - Energy					
PINE: Photonic Integrated Network Energy Efficient Datacenters	81.135	DE-AR0000843		919,140	926,267
Vertical GaN transistors using controlled spalling for substrate heterogeneity	81.135	DE-AR0000452		269,179	500,645
PINE: Photonic Integrated Network Energy Efficient Datacenters	81.135	DE-AR0000843		0	479,232
PINE: Photonic Integrated Network Energy Efficient Datacenters	81.135	DE-AR0000843		0	323,340
PINE: Photonic Integrated Network Energy Efficient Datacenters	81.135	DE-AR0000843		0	316,303
PINE: Photonic Integrated Network Energy Efficient Datacenters	81.135	DE-AR0000843		0	237,844
PINE: Photonic Integrated Network Energy Efficient Datacenters	81.135	DE-AR0000843		0	74,417
				\$1,188,319	\$2,858,048
Total Direct Award Programs				\$2,574,237	\$15,472,799

Pass-through Awards

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Department of Energy					
Photonic Interconnect for Exascale	81	HEWLET CW458432	DE-AC52-07NA27344	0	564,607
Project Controls Support, U.S. ATLAS HL-LHC Upgrade	81	BNL 334322	DE-SC0012704	0	497,808
Joint Appointment agreement between BSA/BNL and Columbia for Jingguang Chen's Salary	81	BNL CU13-1454	DE-AC02-98CH10886	0	302,559
Photonic Memory Controller Module (P-MCM)	81	FPHOTO S7123-01	DOE CU18-0610	0	196,839
Design of Carbide and Bimetallic Catalysts and Electrocatalysts	81	BNL NO.233521	DE-AC02-98CH10886	0	170,643
The Nanostructure Problem in Strongly Correlated Electron and Related Materials	81	BNL CU08-9027	DE-AC02-98CH10886	0	126,469
Center for Thermal Energy Transport under Irradiation	81	INL 208385	DE-AC07-05ID14517	0	95,724
sPHENIX EMCAL Detector Upgrade at RHIC	81	BNL 356535	DOE CU19-0001	0	92,207
Advanced Machine Learning for Synvhrophasor Technology	81	LANL 398437	DE-AC52-06NA25396	0	92,100
NOMAD as a high throughput instrument for materials genomics studies	81	ORNL 4000156508	DE-AC05-00OR22725	0	73,564
GO ORNL PROGRAM for Nikhil Rampal	81	ORNL 4000160263	DE-AC05-00OR22725	0	72,119
sPHENIX Minimum Bias Detector at RHIC	81	BNL 354298	DOE CU19-0187	0	69,441
sPHENIX EMCAL Detector Upgrade at RHIC	81	BNL 346171	DE-SC0012704	0	68,907
Photonic-Storage Subsystem Input/Output (P-SSIO) Interface	81	FPHOTO S7119-01	DOE CU18-0073	0	67,500
Deputy Project manager for the US-ATLAS HL-LHC Upgrade Project	81	BNL 332054	DE-SC0012704	0	65,744
Dynamical Mean Field Theory for Realistic Models of Correlated Materials	81	ARGNTL 7F-30011	DE-AC02-06CH11357	0	64,414
Photonic-Storage Subsystem Input/Output	81	NP CU17-3721	DOE CU17-3721	0	58,915
Postdoctoral Support for Jason Kahn Novel approaches for selfassembly of bio-nanomaterials and enabling their new functions	81	BNL 349458	DE-SC0012704	0	54,547

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Integration of AgMIP Results for the Development of Agricultural Response Functions for PNNL Models - Phase 3	81	PNNL 433471	DE-AC05-76RL01830	0	52,474
Integration of Horizontal Unstructured Mesh Generation Code (JIGSAW) into MPAS-O and MPAS-SI	81	LANL 486629	DE-AC52-06NA25396	0	50,849
Data analysis pipelines with provenance for in-situ x-ray powder diffraction and atomic pair distribution function analysis	81	BNL 349891	DOE CU18-2265	0	42,577
Scalable Forecasting for Improving Grid Efficiency and Resiliency	81	NREL XHA-8-70349-01	DE-AC36-08GO28308	0	41,151
Support to BNL for Nuclear Energy Enabling Technology and Nuclear Science User Facility Activities	81	BNL 346960	DE-SC0012704	0	35,455
The Nanostructure Problem in Strongly Correlated Electron and Related Materials	81	BNL CU08-9027	DE-AC02-98CH10886	0	35,411
A Rigorous Analysis of the Total Residual Stress State of Additively-Manufactured Samples	81	ORNL 4000164362	DE-AC05-00OR22725	0	34,153
Cold Testing ADC Chips on the Deep Underground Neutrino Experiment (DUNE)	81	FERMI 646751	DE-AC02-07CH11359	0	30,168
Exascale Lattice Gauge Theory Opportunities/Requirements for Nuclear & High Energy Physics	81	BNL 333581	DE-SC0012704	0	27,755
Joint Researcher Supported by Columbia University and BNL/CFN	81	BNL 360766	DE-SC0012704	0	19,557
BNL Graduate Student Support	81	BNL 343987	DE-SC0012704	0	17,844
Advanced Machine Learning for Synvhrophasor Technology	81	LANL 398437	DE-AC52-06NA25396	0	13,294
Infrared Nano-Imaging of Metastable States	81	LBNL 7431739	DE-AC02-05CH11231	0	12,015
Graduate Student Support for Brian minevich-Self-Assemble of Nanoparticle Super-Lattices	81	BNL 367063	DE-SC0012704	0	6,163
Dynamical Mean Field Theory for Realistic Models of Correlated Materials	81	ARGNTL 7F-30011	DE-AC02-06CH11357	0	5,744
Graduate Student Support for Christianna Lininger DFT Studies of Ferrite Materials	81	BNL 336515	DOE CU17-1774	0	4,966
Incorporating Silicon Photonics at the System Level	81	SANDIA 1319001	DE-AC04-94AL85000	0	4,567
Analysis of 2018 X-band Radar Data from the ARM Southern Great Plains Observatory	81	PNNL 463719	DE-AC05-76RL01830	0	2,520
Surface Nano-Patterning Methods Based on Polymers to Immobilize DNA-, Biomolecular, and Nanoparticle Based Constructs for Structural and Bio-Sensing Studies	81	BNL 366391	DOE CU19-1524	0	1,346
ÚS-Israel Desalination Design Competition	81	ORNL 4000153171	DE-AC05-00OR22725	0	1,185

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
LLNL Subcontract Laser Meterology	81	LLNL B607933	DE-AC52-07NA27344	0	-170
A discrete-continuum coupling method for environmental-driven fracture in rock	81	SNL PO1557089	DE-AC04-94AL85000	0	-2,853
Numerical Modeling of hydrolic fracturing	81	SANDIA 1690531	DOE CU16-1442	0	-3,922
Joint Appointment agreement between BSA/BNL and Columbia for Jingguang Chen's Salary	81	BNL CU13-1454	DE-AC02-98CH10886	0	-233,621
				\$0	\$2,932,735
Office of Science Financial Assistance Program					
Center for Bio-Inspired Energy Science (CBES)	81.049	SP0027267-PROJ0011442	DE-SC0000989	0	241,065
GENESIS: A Next Generation Synthesis Center	81.049	SUNYSB 82192/1148574/2	DE-SC0019212	0	136,054
EFRC: Center for Mesoscale Conductivity	81.049	RFSUNY 68856	DE-SC0012673	0	133,087
Ültrafast Creation of Emergent Phenomena and Metastable Phases in Complex	81.049	PSU 5710-CU-DOE-2375	DE-SC0012375	0	121,055
Ultrafast Creation of Emergent Phenomena and Metastable Phases in Complex	81.049	PSU 5710-CU-DOE-2375	DE-SC0012375	0	112,595
Studies of Reactive Amorphous Compounds and Surfaces: Their Pathways to Crystallinity and Surface Functionality	81.049	TAMU 02-M1800290	DE-SC0017864	0	109,858
Mid-Atlantic Offshore Carbon Storage Resource Assessment Project	81.049	BMI 504916	DE-FE0026087	0	103,500
Breakthrough Electrolytes for Energy Storage (BEES)	81.049	CWRU RES513723	DE-SC0019409	0	82,528
ŤÜRBÔ: Ťerabits/s Úsing Reconfigurable Bandwidth Optics	81.049	UARIZONA 335551	DE-SC0015867	0	74,953
Photonic-Storage Subsystem Input/Output (P-SSIO) Interface	81.049	AYAR DOE-SUB-0001	DE-SC0018496	0	67,500
Planar Systems for Quantum Information	81.049	CU 86856-11154	DE-SC0019481	0	60,343
Rational Design of Innovative Catalytic Technologies for Biomass Derivative Utilization	81.049	UD 32826	DE-SC0001004	0	53,492
Photonic-Storage Subsystem Input/Output	81.049	EMU 001	DE-SC0018472	0	45,770
Center for Bio-Inspired Energy Science (CBES)	81.049	SP0027267-PROJ0011442	DE-SC0000989	0	40,538

ederal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Planar Systems for Quantum Information	81.049	CU 86856-11154	DE-SC0019481	0	(Includes Subrecipients) 39,882
In Situ Characterization of Nanoparticle Nucleation and Growth Using Combined Pair Distribution Function Analysis	81.049	BNL 350385	DE-SC0012704	0	20,000
EFRC: Center for Mesoscale Conductivity	81.049	RFSUNY 68856	DE-SC0012673	0	19,856
Bayesian Cloud Property Retrievals from ARM Active and Passive Measurements	81.049	UCLA 2095 G UA028	DE-SC0016118	0	8,48
EFRC: Center for Mesoscale Conductivity	81.049	RFSUNY 68856	DE-SC0012673	0	6,78
Improving Parameterization of Ice Microphysical Processes in Arctic Clouds using a Synergistic Modeling and Observational Approach	81.049	PSU 5933-CU-USDOE-8933	DE-SC0018933	0	1,208
Integration of AgMIP results for the development of agricultural response functions for PNNL Models	81.049	PNNL 296668	DE-AC05-76RL01830	0	62°
Command and Control System of Systems, Regional Smart Grid Demonstration in New York and New Jersey	81.049	CON ED No. SA-SG003	DE-DE0000197	0	-28,034
				\$0	\$1,451,130
enewable Energy Research and Development					
Improved Performance and Reliability of Cu(InGa)(SeS)2 PV Modules using the Reaction of Metal Precursors	81.087	UDELAWARE 48779	DE-EE0007542	0	85,343
				\$0	\$85,343
ossil Energy Research and Development					
Collaborative Development Projects - Photonic Memory Controller Module (P-MCM)	81.089	PLCC CU18-0520	DOE CU18-0520	0	468,892
Deepwater Methane Hydrate Characterization in the Gulf of Mexico: Scientific Assessment and Production Potential	81.089	UTA14-001159	DE-FE0023919	0	143,254
Photonic-Storage Subsystem Input/Output (P-SSIO) Interface	81.089	PLCC CU17-3893	DOE CU17-3893	0	67,500
Mechanisms for Metyhane Transport and Hydrate Accumulation in Coarse-grained Reservoirs	81.089	UTEXAUS UTA13-001088	DE-FE0013919	0	1,085
				\$0	\$680,731
Defense Nuclear Nonproliferation Research					
Consortium for Verification Technology	81.113	UMICHG 3003222364	DE-NA002534	0	271,660
				\$0	\$271,660

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Advanced Research Projects Agency - Energy					
Minimally Orchestrated Storage Technology for Duration Addition to Electricity Storage	81.135	PRIMUS CU18-3145	DE-AR0000990	0	113,264
High Fidelity, Year Long Power Network Data Sets for Replicable Power System Research	81.135	UMICH 3004152692	DE-AR0000715	0	78,271
				\$0	\$191,535
Total Pass-through Programs				\$0	\$5,613,134
Total: Department of Energy				\$2,574,237	\$21,085,933
Department of Defense					
Direct Awards					
Defense Advanced Research Projects Agency					
BISC: Bioelectronic Interfacing to Sensory Cortex with massive, fully implanted, flexible wireless CMOS surface recording and stimulating arrays	12	N66001-17-C-4002		2,048,932	3,255,240
Hardware-Up Security: Anti-fragility and Automation	12	HR001118C0017		390,276	1,219,856
Hardware-Up Security: Anti-fragility and Automation	12	HR001118C0017		0	229,445
BISC: Bioelectronic Interfacing to Sensory Cortex with massive, fully implanted, flexible wireless CMOS surface recording and stimulating arrays	12	N66001-17-C-4002		0	223,719
BISC: Bioelectronic Interfacing to Sensory Cortex with massive, fully implanted, flexible wireless CMOS surface recording and stimulating arrays	12	N66001-17-C-4002		0	180,334
Robust Learning in Brain Circuits of Synthetic Miniature Insects	12	HR00111990035		0	55,252
BISC: Bioelectronic Interfacing to Sensory Cortex with massive, fully implanted, flexible wireless CMOS surface recording and stimulating arrays	12	N66001-17-C-4002		0	48,058
Robust Learning in Brain Circuits of Synthetic Miniature Insects	12	HR00111990035		0	32,473
Deciphering the Cortex: Circuit inference from large-scale brain activity data	12	N66001-15-C-4032		0	-414
Breaking the Code: Engineering Neural Controllers and Behavior in Hydra	12	DARPA HR0011-17-C-0026		0	-605

**Defense Threat Reduction Agency** 

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Developing Real-Time Forecasts of Infectious Diseases	12	DTRA HDTRA 1-15-C-0018		0	-72
Department of the Air Force, Air Force Research Laboratory					
Interpretable and Robust Articial Intelligence Software	12	FA8750-18-C-0130		0	133,983
Intelligence Advanced Research Projects Activity					
System for CRoss-Language Information Processing, Translation, and Summarization (SCRIPTS)	12	FA8650-17-C-9117		2,301,329	3,113,172
System for CRoss-Language Information Processing, Translation, and Summarization (SCRIPTS)	12	FA8650-17-C-9117		0	445,82
System for CRoss-Language Information Processing, Translation, and Summarization (SCRIPTS)	12	FA8650-17-C-9117		0	217,360
IARPA StoneSoup - Minestrone	12	FA8650-10-C-7024		0	-
				\$4,740,537	\$9,153,62
Basic and Applied Scientific Research					
Scanned Probe and Electrical Characterization of One and Two Dimensional Materials	12.300	N00014-17-1-2967		0	409,13
Perfect Semiconductors from Imperfect Materials: Dynamic Screening as a Design Principle	12.300	N00014-18-1-2080		0	289,06
New Frontiers of Nano-photonics: Multi-THz Imaging and Spectroscopfy of Graphene	12.300	N000014-18-1-2722		4,529	271,64
Causal inference using hierarchical and nonparametric Bayesian interaction models	12.300	N00014-17-1-2141		43,404	270,137
Modular Automated Microbial Biobanking and Analysis (MAMBA) System to Enhance DoD-relevant Microbiom	12.300	N00014-18-1-2237		0	249,25
Strategic Dynamic of Cyber Conflict	12.300	N00014-17-1-2423		0	244,189
The YOLO Approach to Resilient Cyber Physical Systems	12.300	N00014-15-1-2173		0	224,54
Informative priors for Bayesian inference and regularization	12.300	N00014-15-1-2541		0	202,70
High Performance Organic Solar Cells from Conjugated Ribbons	12.300	N00014-17-1-2205		0	195,85
Dynamics and Prediction of the Boreal Summer Intraseasonal Oscillation in the Maritime Continent	12.300	N00014-16-1-3073		0	183,94

For year ended June 30, 2019

Endows Country / David Manuals Country					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Precision Photodissociation: a New Tool for Ultracold Chemistry and Physics, and a Source of Novel	12.300	N00014-17-1-2246		0	179,077
Acquisition of an Amplified Laser System for Transient Nano-Spectroscopy and Nano-Imaging of Functional Materials	12.300	N00014-18-1-2737		0	172,420
Adapting Static and Dynamic Program Analysis to Effectively Harden Debloated Software	12.300	N00014-16-1-2263		0	172,288
Next-Generation Massively Parallel Cellular Biosurveillance and Recording Devices	12.300	N00014-17-1-2353		0	155,911
Phase-Change Correlated Perovskites as a New Platform for Photonics	12.300	N00014-16-1-2442		0	152,789
Designer 2D bandstructures by superlattice patterning of layered materials	12.300	N00014-17-1-2832		0	149,642
Multiscale Mesh-Based Meshless Method M4	12.300	N00014-17-1-2085		0	147,365
Development of Singlet Fission Materials for Third-Generation Solar Cells	12.300	N00014-15-1-2532		0	146,694
Fundamental Limits and Efficient Algorithms for Tensor Inverse Problems	12.300	N00014-17-1-2827		0	140,560
Computational Certification Under Limited Experimental Data	12.300	N00014-17-1-2038		0	138,463
BUDDY: TCB Hardening for Cyber Physical Systems	12.300	N00014-17-1-2010		0	137,644
Functional Bio-Nano Composites for Energy Conversion and Actuation	12.300	N00014-19-1-2200		0	135,589
BUDDY: TCB Hardening for Cyber Physical Systems	12.300	N00014-17-1-2010		0	132,762
Multimodal matrix and tensor factorization methods exploiting strong structural and side information	12.300	N00014-17-1-2843		0	120,584
Next-Generation Variational Methods: Active Inference, Streaming Inference, and Assessing Model Fitness	12.300	N00014-15-1-2209		0	115,349
Graphene-Silicon Photonics for Extreme Sensitivity, Cryogenic-Room Temperature Dense WDM Interconnects	12.300	N00014-16-1-2219		0	108,670
Biologically inspired architectures for evaporation-driven active materials	12.300	N00014-16-1-2449		0	107,753
Graphene-Silicon Photonics for Extreme Sensitivity, Cryogenic-Room Temperature Dense WDM Interconnects	12.300	N00014-16-1-2219		0	103,047
High Performance Organic Solar Cells from Conjugated Ribbons	12.300	N00014-17-1-2205		0	101,910
Bay of Bengal Intraseasonal Oscillations and the Upper Ocean Mesoscale	12.300	N00014-17-1-2394		0	80,957

For year ended June 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
New frontiers of nano-photonics: multi-THz imaging and spectroscopfy of graphene based nanostructure	12.300	N00014-15-1-2671		60,101	60,101
A Foundational Synthetic Biology Toolbox for Engineering Human But Microbiota towards Enhancing Warfighter Capabilities	12.300	N00014-15-1-2704		0	59,784
Low Latitude Indian to Western Pacific, From 40E to 160E	12.300	N00014-16-1-2480		0	57,923
Practical algorithms for polynomial optimization	12.300	N00014-16-1-2889		0	57,546
Learning by Doing: Realized Low-level Manipulation Skills as the Foundation for High-level Human-robot Collaboration	12.300	N00014-19-1-2062		0	56,812
Collaborative Dexterous Manipulation: Mechanisms and Interfaces	12.300	N00014-16-1-2026		0	35,323
Dynamics and Prediction of the Boreal Summer Intraseasonal Oscillation in the Maritime Continent	12.300	N00014-16-1-3073		0	27,975
Culture in Power Transitions: Sino-American Conflict in the 21st Century	12.300	N00014-15-1-0039/N00014-16-1	2	0	20,081
Informative Priors for Bayesian Inference, Regularization, and Computation	12.300	N00014-19-1-2204		0	19,846
Culture in Power Transitions: Sino-American Conflict in the 21st Century	12.300	N00014-15-1-0039/N00014-16-1-	2	0	10,346
BÜDDY: TCB Hardening for Cyber Physical Systems	12.300	N00014-17-1-2010		0	7,311
Empirical Analysis for Meeting Great Power Challenges	12.300	N00014-19-1-2466		0	894
				\$108,034	\$5,653,880
Scientific Research - Combating Weapons of Mass Destruction					
Development of Inhibitors of the Aging Process of Organophosphate Adducts of AChE	12.351	HDTRA1-16-1-0053		42,737	189,307
DTRA2013-Enzyme Cascades	12.351	HDTRA1-14-1-0051		0	128,841
Investigation of Data-Intensive Discovery Methods for Improved Seismic Monitoring	12.351	HDTRA1-11-1-0027		18,492	108,488
Power Grid Vulnerability and Resilience to Geographically Correlated Failures	12.351	HDTRA1-13-1-0021		79,404	85,369
Power Grid Vulnerability and Resilience to Geographically Correlated Failures	12.351	HDTRA1-13-1-0021		0	66,872
Development of Inhibitors of the Aging Process of Organophosphate Adducts of AChE	12.351	HDTRA1-16-1-0053		0	49,667

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
DTRA2013-Enzyme Cascades	12.351	HDTRA1-14-1-0051		0	34,256
				\$140,633	\$662,800
Military Medical Research and Development					
Programmable Probiotics as Primary and Metastatic Breast Cancer Therapeutics	12.420	W81XWH-17-1-0356		0	490,132
GREAT-SF (Grief REsilience Activities and Training For Surviving Families): an Online Selective Intervention for Bereved Military Families	12.420	W81XWH-15-2-0043		0	488,989
Multispecies, Integrative GWAS for Focal Segmental Glomerulosclerosis	12.420	W81XWH-16-1-0450		0	361,429
Defining the Role of the 5-HT4 Receptor in the Brain, Behavior, and Gut Abnormalities Resulting from in Utero SSRI Exposure	12.420	W81XWH-17-1-0166		51,235	354,112
Genetic variation underlying traumatic brain injury (TBI) and late Onset Alzheimer's Disease (LOAD)	12.420	W81XWH-16-1-0588		0	329,642
Receptors in Endosomes Mediate Chronic Pain Associated with Trauma and Stress: Non-Opioid Targets for Pain	12.420	W81XWH-18-1-0431		30,030	288,750
Actin fence therapy for Acute Lung Injury	12.420	W81XWH-16-1-0368		0	282,604
Multispecies, Integrative GWAS for Focal Segmental Glomerulosclerosis	12.420	W81XWH-16-1-0451		0	267,592
Identifying New Chemical Entities that Treat and Prevent Relapsing vivax and Drug-Resistant falciparum Malaria in U.S. Military Personnel	12.420	W81XWH-15-2-0033		0	263,035
Adaptively Conforming Osteochondral Allografts for Joint Replacements	12.420	W81XWH1810361		35,810	262,120
Identification of Effector and Suppressive T-Cell Clones in Graft-vs-Host Disease	12.420	W81XWH1810328		0	252,714
Programmable probiotics for early detection of lung cancer	12.420	W81XWH-17-1-0395		51,876	232,916
Investigation of a Putative Prostate Stem Cell Niche	12.420	W81XWH-16-1-0345		0	209,221
Targeting Immune Microenvironment Interactions in Lung Cancer Metastasis	12.420	W81XWH-17-1-0441		0	192,944
Developmental Pathways and Autism Spectrum Disorders	12.420	W81XWH-17-1-0566		88,143	191,249
DEFINING THE RÔLE OF THE 5- HT4 RECEPTOR IN THE BRAIN, BEHAVIOR AND GUT ABNORMALITIES RESULTING FROM IN UTERO SSRI EXPOSURE	12.420	W81XWH-17-1-0167		0	180,960
Striatal cholinergic interneuron ablation dystonia model	12.420	W81XWH-17-1-0209		0	177,686

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Role of Tumor infiltrating B cells in breast cancer metastasis.	12.420	W81XWH-17-1-0055		0	168,875
Cardiomyocyte Chirality Defects in Congenital Heart Disease	12.420	W81XWH-17-1-0112		0	168,710
Integrative Device for Treating Rotator Cuff Tendon Injuries	12.420	W81XWH-15-1-0685		0	156,877
Identification of master transcriptional regulators of neuroendocrine differentiation in prostate cancer	12.420	W81XWH-18-1-0424		0	153,980
The role of activation induced cytidine deaminase in pesticide-related lymphomagenesis	12.420	W81XWH-18-1-0394		0	152,090
Study of Spinal Muscular Atrophy in a Human Neuromuscular Junction Three-Dimensional Optogenetic Model	12.420	W81XWH1810095		0	133,803
TBI-Induced Formation of Toxic Tau and Its Biochemical Similarities to Tau in AD Brains	12.420	W81XWH-15-1-0550		28,905	125,416
Immune privilege of the hematopoietic stem cell niche in the bone marrow shields metastatic prostate cancer from immunity	12.420	W81XWH-18-10191		0	119,759
Development of a Novel Approach to Regenerate Functional Lungs	12.420	W81XWH-17-1-0139		0	114,373
Neural Crest Origin of TSC Tumors	12.420	W81XWH-18-1-0077		0	102,515
Impaired mTOR-Macroautophagy and Neurocognitive Deficits in Tuberous Sclerosis Complex	12.420	W81XWH-16-1-0263		0	101,636
Apathy and Negative Symptoms in Alzheimer s Disease: Investigation of the Proline*COMT Interaction for Symptom Targeting to Positively Impact Quality of Life	12.420	W81XWH-18-1-0285		0	96,230
Mitochondrial dysfunction and disease progression	12.420	W81XWH-15-1-0450		31,687	95,002
Molecular mechanisms underlying the epileptogenesis and seizure progression in Tuberous Sclerosis Complex 1 deficient mouse models	12.420	W81XWH-15-1-0112		0	80,374
Role of Tumor-Infiltrating B Cells in Breast Cancer Metastasis	12.420	W81XWH-17-1-0056		0	72,168
Targeting MEK5 Enhances Radiosensitivity of Human Prostate Cancer and Impairs Tumor Associated Angiogenesis	12.420	W81XWH-15-1-0296		0	65,740
Topical Application of Tranexamic Acid to Reduce Blood Loss During Spine Surgery	12.420	W81XWH-14-2-0177		0	59,598
TBI-Induced Formation of Toxic Tau and Its Biochemical Similarities to Tau in AD Brains	12.420	W81XWH-15-1-0550		0	41,205
Physical Telerehabilitation in Patients with Multiple Sclerosis with Significant Mobility Impairment	12.420	W81XWH-16-1-0704		0	37,346
Electric Field Stimulation Enhances Healing of Post-Traumatic Osteoarthritic Cartilage	12.420	W81XWH-14-1-0591		0	23,640

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Targeting Mitochondrial Metabolism as a Key Vulnerability in Artemisinin-Resistant Plasmodium falciparum Malaria	12.420	W81XWH-19-1-0086		0	(Includes Subrecipients) 20,695
Characterization of Epigenetic Regulatory Drivers of Prostate Cancer Metastasis	12.420	W81XWH-16-01-0243		0	13,345
Programmable Probiotics as Primary and Metastatic Breast Cancer Therapeutics	12.420	W81XWH-17-1-0356		0	11,241
Physical Telerehabilitation in Patients with Multiple Sclerosis with Significant Mobility Impairment	12.420	W81XWH-16-1-0704		0	8,723
TBI-Induced Formation of Toxic Tau and Its Biochemical Similarities to Tau in AD Brains	12.420	W81XWH-15-1-0550		0	3,777
Prebiotic Inulin to Limit Antimicrobial Resistant Infections During Critical Illness: A Phase II Clinical Trial	12.420	W81XWH-19-1-0287		0	2,346
Electric Field Stimulation Enhances Healing of Post-Traumatic Osteoarthritic Cartilage	12.420	W81XWH-14-1-0591		0	493
Establishment of donor Chimerism Using Allogeneic Bone Marrow with AMP Cell Co-infusion	12.420	W81XWH-15-1-0234		0	396
Columbia SMA project: 4-AP as a potential SMA therapeutic agent and biological mechanisms of action	12.420	W81XWH-11-1-0753		0	-13
Identification of master regulators of advanced and castrate-resistant prostrate cancer under treatment with Abiraterone.	12.420	W81XWH-13-1-0422		0	-81
Stationary Digital Tomosynthesis System for Early Detection of Breast	12.420	W81XWH-10-1-0008		0	-177
Transcriptome Annotation of Infectious Agents host Species using High Throughput Genomic Data	12.420	W81XWH-13-2-0029		0	-388
Therapeutic Targeting of Notch in Ovarian Cancer	12.420	W81XWH-09-1-0408		0	-469
Proteomic Mapping of the Immune Response to Gluten in Children with Autism	12.420	W81XWH-14-1-0293		0	-479
Molecular mechanisms underlying the epileptogenesis and seizure progression in Tuberous Sclerosis Complex 1 deficient mouse models	12.420	W81XWH-15-1-0112		0	-80,374
				\$317,686	\$6,874,467
Basic Scientific Research					
Imaging how a neuron computes	12.431	W911NF-12-1-0594		230,961	575,446
Descriptive, Injunctive, and Sacred Norms	12.431	W911NF-18-1-0091		0	269,276
A Symbiotic Agent-Based Network Platform Linking Expert Knowledge and Machine Learning for Systemic Risk Mitigation	12.431	W911NF1910013		129,931	218,067

#### The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

ederal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Building Efficient Fuzzers using Automata Learning	12.431	W911NF1810326		0	(Includes Subrecipients) 147,787
Intent Switching and Co-Adaption of Man and Machine in a Closed-Loop Brain Computer Interface (8.4 Neurophysiology and Cognitive Neuroscience)	12.431	W911NF-16-1-0507		0	145,660
Phase Transitions and Elusive Electronic States In Correlated Oxides	12.431	W911NF-17-1-0543		0	141,032
Distributed High Performance Algorithms for Mobile Ad Hoc Networks	12.431	W911NF-16-1-0259		96,396	121,544
Characterizing and Enhancing Biological Corrosion of Metals	12.431	W911NF1810239		0	121,013
Imaging how a neuron computes	12.431	W911NF-12-1-0594		0	118,114
Development of Chip-Based Optical Parametric Oscillators for Coherent Computing and Quantum Random Number Generation	12.431	W911NF-17-1-0016		0	111,318
Imaging how a neuron computes	12.431	W911NF-12-1-0594		0	97,146
Imaging how a neuron computes	12.431	W911NF-12-1-0594		0	94,464
Imaging how a neuron computes	12.431	W911NF-12-1-0594		0	78,260
Development of Chip-Based Optical Parametric Oscillators for Coherent Computing and Quantum Random Number Generation	12.431	W911NF-17-1-0016		0	55,945
Imaging how a neuron computes	12.431	W911NF-12-1-0594		0	53,905
Phase field modeling of ice-segregation induced fracture and thawing plasticity in frozen geomaterials with unfrozen water.	12.431	W911NF1820306		0	25,838
Developing accelerated learning models in GIFT for medical military and civilian training	12.431	W911NF1820097		0	25,282
Understanding hydro-mechanical coupling mechanism of wetted granular matters beyond the pendular regime	12.431	W911NF-15-1-0581		0	13,148
Conference Support: Dendritic Computation	12.431	W911NF1810131		0	9,353
Conference Support: Dendritic Computation	12.431	W911NF1810131		0	5,913
The role of ApoE in Alzheimer disease and in traumatic brain injury	12.431	W911NF-15-1-0169		0	2,902
Phase field modeling of ice-segregation induced fracture and thawing plasticity in frozen geomaterials with unfrozen water.	12.431	W911NF1820306		0	1,875
				\$457,288	\$2,433,288

For year ended June 30, 2019

ederal Grantor / Pass-through Grantor	CFDA	Drain et No	Door through Contract Number	0	R&D Cluster
edetai Grantoi / Pass-unough Grantoi	CFDA	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Air Force Defense Research Sciences Program					
Artificial Atoms, Molecules, and Solids: Multiple Functions and Emergent Properties	12.800	FA9550-18-1-0020		0	776,076
Characterizing Neural Code From a Minimum-Description-Length Perespective	12.800	FA9550-15-1-0439		69,494	280,394
Polaritonic Metamaterials Based on Van Der WAALS Heteostructures	12.800	FA9550-15-1-0478		0	214,204
New Functionally in van der Waals Helterostructures	12.800	FA9550-16-1-0601		0	204,688
Foundations of Neuroinformation Processing Phase and Spike Processing Machines	12.800	FA9550-16-1-0410		0	165,631
Rational Design of Composite Solid Electrolyte for Structural Energy Storage	12.800	FA9550-18-1-0410		0	161,519
Spoken Indicators of Trust Across Cultures	12.800	FA9550-18-1-0039		0	153,427
Fundamental Studies of Microresonator-Based Parametric Frequency Combs	12.800	FA9550-15-1-0303		0	145,035
Artificial Atoms, Molecules, and Solids: Multiple Functions and Emergent Properties	12.800	FA9550-18-1-0020		0	121,904
Apparatus for Laser Cooling, Trapping, and Discussion of BaH molecules	12.800	FA9550-17-1-0441		0	105,914
Artificial Atoms, Molecules, and Solids: Multiple Functions and Emergent Properties	12.800	FA9550-18-1-0020		0	98,053
Particle Tracking for analysis of Exosomes and other subcellular compartments for Research in TBI, PD and AD	12.800	DAF OSR FA9550-18-1-0441		0	94,940
Intelligent Learning	12.800	FA9550-15-1-0502		59,906	85,372
Thermoelectric Phenomena in Quasi-One-Dimentional Metals	12.800	FA9550-19-1-0156		35,537	82,833
Thermoelectric Phenomena in Quasi-One-Dimensional Metals	12.800	FA9550-18-1-0063		12,887	82,155
Fundamental Studies of Microresonator-Based Parametric Frequency Combs	12.800	FA9550-15-1-0303		0	75,224
(YIP) Modeling the High-Rate Responses of Wetted Granular Materials Across Scales and the Third-Party Replicable Validation Exercises Utilizing 3D Printers	12.800	FA9550-17-1-0169		0	60,956
				\$177,824	\$2,908,325

Research and Technology Development

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
THUNDER: Tolerant Hosts Using Novel Drug-Enhanced Resilience	12.910	HR0011-17-2-0009		232,065	1,256,142
The Virome of Manhattan: A Testbed for Radically Advancing Understanding and Forecast of Viral Respiratory Infections	12.910	W911NF-16-2-0035		26,565	1,108,520
The Virome of Manhattan: A Testbed for Radically Advancing Understanding and Forecast of Viral Respiratory Infections	12.910	W911NF-16-2-0035		0	526,868
Development and Application of Silicon-Chip-Based Mid-Infrared Frequency Combs	12.910	W31P4Q-16-1-0002		496,510	496,510
PULSE: Phased-array Ultrasound for Electroceuticals	12.910	HR0011-15-2-0054		1,217	493,869
Real-Time Control of Network Physical Structures to Bypass Complexity: Optimization, Stochastics an Structure Recognition	d 12.910	N660011824028		36,887	482,960
Auto-generative Neural Networks for Lifelong Learning	12.910	HR0011-18-2-0020		0	443,293
High-Performance Parametric RF Integrated Non-Reciprocal Circulators (HIPERION)	12.910	HR0011-17-2-0007		128,124	441,138
PULSE: Phased-array Ultrasound for Electroceuticals	12.910	HR0011-15-2-0054		0	299,803
SOAS: Interactive design compiler based on simultaneous optimization and simulation	12.910	HR0011-17-2-0014		0	293,816
Multifunctional Glass for Augmented Reality	12.910	HR00111720034		0	244,940
Resistant and scalable storage using semi-synthetic DNA	12.910	D17AP00027		0	243,589
Multifunctional Glass for Augmented Reality	12.910	HR00111720034		224,281	224,281
ENGINEERING PROTOTROPHY IN MAMMALIAN CELLS	12.910	HR0011-17-2-0041		191,483	216,705
Multifunctional Glass for Augmented Reality	12.910	HR00111720034		0	215,502
Scalable Millimeter-wave Arrays based on Dual-Use 3D Heterogeneous Architectures	12.910	DARPA-FA86501617644		0	212,941
A Multimodal Oral Non-viral CRISPR-Cas Medical Countermeasure to Enhance Ionizing Radiation Resilience and Survival	12.910	HR0011-19-2-0009		0	209,430
PULSE: Phased-array Ultrasound for Electroceuticals	12.910	HR0011-15-2-0054		0	205,331
Reproducible and Scalable Bayesian Modeling for Next-Generation Social Sciences	12.910	D17AC00001		0	197,401
Densely Packed 2D Photonic Phased Array	12.910	FA8650-18-1-7815		0	178,233

For year ended June 30, 2019

,					R&D Cluster
Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
SEEM: Inferring Sentiment bElief pErspective and eMothin for Low Resource Languages	12.910	HR0011-15-2-0041		13,041	177,284
Reproducible and Scalable Bayesian Modeling for Next-Generation Social Sciences	12.910	D17AC00001		0	168,240
Multifunctional Glass for Augmented Reality	12.910	HR00111720034		0	167,923
Multifunctional Arrays based on Scalable Single-wire-interfaces, Antenna-cointegration and Linearization (MASSALa)	12.910	FA8650-19-1-7998		29,380	165,224
Development and Application of Silicon-Chip-Based Mid-Infrared Frequency Combs	12.910	W31P4Q-16-1-0002		0	133,309
Multifunctional Glass for Augmented Reality	12.910	HR00111720034		0	108,121
A Multimodal Oral Non-viral CRISPR-Cas Medical Countermeasure to Enhance Ionizing Radiation Resilience and Survival	12.910	HR0011-19-2-0009		0	106,105
SEEM: Inferring Sentiment bElief pErspective and eMothin for Low Resource Languages	12.910	HR0011-15-2-0041		0	102,685
A Multimodal Oral Non-viral CRISPR-Cas Medical Countermeasure to Enhance Ionizing Radiation Resilience and Survival	12.910	HR0011-19-2-0009		0	71,159
SEEM: Inferring Sentiment bElief pErspective and eMothin for Low Resource Languages	12.910	HR0011-15-2-0041		0	63,907
SEEM: Inferring Sentiment bElief pErspective and eMothin for Low Resource Languages	12.910	HR0011-15-2-0041		16,869	47,341
A Multimodal Oral Non-viral CRISPR-Cas Medical Countermeasure to Enhance Ionizing Radiation Resilience and Survival	12.910	HR0011-19-2-0009		0	44,528
Multifunctional Glass for Augmented Reality	12.910	HR00111720034		0	40,619
Development and Application of Silicon-Chip-Based Mid-Infrared Frequency Combs	12.910	W31P4Q-16-1-0002		0	37,604
High-Performance Parametric RF Integrated Non-Reciprocal Circulators (HIPERION)	12.910	HR0011-17-2-0007		0	15,571
Multifunctional Glass for Augmented Reality	12.910	HR00111720034		0	14,312
Reproducible and Scalable Bayesian Modeling for Next-Generation Social Sciences	12.910	D17AC00001		0	7,785
Superbroadband Achromatic Metasurface Lenses	12.910	HR0011-17-2-0017		0	3,054
Metasurface-Based Spatial Light Modulators	12.910	D15AP00111		0	1,162
DARPA SEED: Development of Ultraflow Power Supercontinuum Platform Based on Silicon Nitride	12.910	N66001-16-1-4055		0	-1

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
				\$1,396,422	\$9,467,204
Total Direct Award Programs				\$7,338,424	\$37,153,585
Pass-through Awards					
Defense Advanced Research Projects Agency					
IBIS: Implantable bioluminescence interface for an all-optical neuroprosthesis to the visual cortex	12	JBPL 285-B Phase II	N66001-17-C-4012	0	742,234
Éngineered Living Materials	12	ECODES CU16-2615	DARPA-BAA-16-50	0	419,631
Building blocks and Search Improvements for Automated Machine Learning Model Selection	12	KEYW 50001964	W911NF-16-C-0005	0	334,615
Fast Electric Grid Communication Network Isolation and Restoration (PHOENIX)	12	BAE 941140	DARPA CU16-0568	0	306,392
Democratizing DDos Defenses Using Secure Indirection Networks	12	GMU E203809-01	HR0011-16-C-0055	0	240,933
EPOCHS: Efficient Programmability of Cognitive Heterogeneous Systems	12	IBM CW2912424	HR0011-18-C-0122	0	238,428
Engineered Living Materials	12	ECODES CU16-2615	DARPA-BAA-16-50	0	204,094
Chip-Scale Optical Planar LADAR Architecture (COPLA)	12	TREX S20100	DARPA-BAA-16-13	0	156,043
Pathways to Recruitment: Identifying and Comparing Social Indicators of Gang Violence and Recruitment in a Chicago Twitter Data Set with ISIS Engagement Using Qualitative Analysis and Natural Language	12	USC-PO55630053	FA8750-14-C-0240	0	131,102
EPOCHS: Efficient Programmability of Cognitive Heterogeneous Systems	12	IBM CW2912424	HR0011-18-C-0122	0	89,807
Machine-Intelligence for Advance Notification of Threats and Energy-Grid Survivable Situational Awareness (MANTESSA)	12	ACS PO-0008887	FA8750-16-C-0054	0	70,584
Machine-Intelligence for Advance Notification of Threats and Energy-Grid Survivable Situational Awareness (MANTESSA)	12	ACS PO-0008887	FA8750-16-C-0054	0	57,310
Heterogeneously Integrated Optical Synthesizer (H-iOS)	12	UCB 00009636	HR0011-15-C-0057	0	55,289
Machine-Intelligence for Advance Notification of Threats and Energy-Grid Survivable Situational Awareness (MANTESSA)	12	ACS PO-0008887	FA8750-16-C-0054	0	38,115
Integrated Power Management for Novel Compute	12	CEI HR0011-18-3-0011	HR001117S0056	0	19,991
Chip-Scale Optical Planar LADAR Architecture (COPLA)	12	TREX S20100	DARPA-BAA-16-13	0	13,155

For year ended Julie 30, 2019					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Pathways to Recruitment: Identifying and Comparing Social Indicators of Gang Violence and Recruitment in a Chicago Twitter Data Set with ISIS Engagement Using Qualitative Analysis and Natural Language	12	USC-PO55630053	FA8750-14-C-0240	0	12,214
Heterogeneously Integrated Optical Synthesizer (H-iOS)	12	UCB 00009636	HR0011-15-C-0057	0	8,970
CONCEAL: Cryptographic Obfuscation of CodE and ALgorithms	12	IBM 4915012804	W911NF-15-C-0236	0	6,822
CONCEAL: Cryptographic ObfuscatioN of CodE and ALgorithms	12	IBM 4915012804	W911NF-15-C-0236	0	3,840
Magnetic Optical and Acoustic Neural Access (MOANA) System	12	RICEUNIV R1A262	N6600119C4020	0	1,290
Domain-specific Insight Graphs	12	USC-PO55630053	FA8750-14-C-0240	0	231
Broad Operational Language Translation (BOLT)	12	IBM 4913003303	DARPA-BAA-11-40	0	-1
IBIS: Implantable bioluminescence interface for an all-optical neuroprosthesis to the visual cortex	12	JBPL 285-B Phase II	N66001-17-C-4012	0	-25,887
efense Threat Reduction Agency					
Determination and Understanding of Quantitative Infectious Dose for Ebola Virus	12	UTMB 17-031	HDTRA1-17-C-0009	0	1,011,334
Department of Defense					
Columbia Entrepreneurship, Innovation, and Design Support for MD5 Staff	12	CMI2 1904-01-012-01	47QTCA18D00DK	0	67,616
Long Term Potentiation Deficits after Repetitive Primary Blast	12	SURVICE S17-095006	DOTC-17-01-INIT0086/OTA 2014-3	0	63,750
Anticipatory Analytics for Environmental Stressors Phase 2	12	ISCI W912HZ19C0005-SC-01	W912HZ19C0005	0	59,832
STTR: Particulate Composite Mixing Processes	12	GEMI FFP-2016-CU-0401	FA9550-16-C-0018	0	7,089
Multicenter Randomized Trial of Everolimus in Pediatric Heart Transplantation	12	CHMCB CU17-3614	W81XWH-17-1-0532	0	3,483
Department of the Air Force					
3D nondestructive imaging techniques for mesoscale damage analysis	12	ALT-2017CU-001	FA8651-14-C-0045	0	95,476
A Brain Computer Interface for a New Approach to Hearing Aid Design	12	MIT 7000410874	DAF CU17-3727	0	43,437

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Department of the Air Force, Air Force Research Laboratory					
Alteration Detection & Provenance Tracking (In Visual Imagery, Scenes, Media) (ADAPT (IVISM))	12	KITWARE K001892-00-S03	FA8750-16-C-0166	0	201,825
Identification of Eigenstrain Modeling Best Practices and Error Quantification	12	UDAYTON RSC17056	FA8650-12-D-3212/0009	0	57,999
Conventionalized Orthography and Morphological Research	12	BATC 21770.003.02.01	FA8650-11-C-6160	0	16,849
Develop physics-based damage, oxidation, and coupled mechanical oxidation models	12	UTC PSA-1205265 PO2603158	FA8650-13C-5213	0	240
Department of the Army, Army Research Office					
Fundamentally New Methods of Fabrication (SuperVan)	12	BBN PO4201804852/SLIN 0002	W911NF-18-C-0044	0	145,393
Abelian Bridge to Non-Abelian Anyons in Ultra-Cold Atoms and Graphene	12	UCSB KK1813	W911NF-17-1-0323	0	125,358
Fundamentally New Methods of Fabrication (SuperVan)	12	BBN PO4201804852/SLIN 0002	W911NF-18-C-0044	0	36,337
DEPARTMENT OF THE NAVY					
Energy Efficient, Non-Silicon Digital Signal Processing (DSP)	12	HYPRES HYP-N68335-18-C-0654	NAVY CU18-0788	0	44,535
Columbia University Participation in Low-Power Broadband Superconducting Digitizer for Frequency-Multiplexed Imaging Array	12	HYPRES CU17-2838	NAVY CU17-2838	0	3,592
Intelligence Advanced Research Projects Activity					
Reverse Engineering Neocortical Intelligence	12	BCM PO700000428	D16PC0000	0	106,365
Sparse Heterogeneous Representations and Domain Adaptive Matching for Unconstrained Face Recognition	12	UMD 21444-Z9885004	IARPA 2014-1407 1600012	0	97,506
Janus Program Transition Research on Optimized Algorithms	12	UMARY Z3893-Z9335202	IARPA 2019-022600002	0	58,738
Sparse Heterogeneous Representations and Domain Adaptive Matching for Unconstrained Face Recognition	12	UMD 21444-Z9885004	IARPA 2014-1407 1600012	0	23,076
Cortical Architecture and Algorithms for Machine Listening	12	HARVARD 167937-5093338	D16PC0008	0	18,368

**National Security Agency** 

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Contribution to ACS Modeling, Simulation & Emulation Project	12	BAHI S900741BAH	FA8075 14 D 0002	0	80,786
Contribution to ACS Modeling, Simulation & Emulation Project	12	BAHI S900741BAH	FA8075 14 D 0002	0	47,402
Contribution to ACS Modeling, Simulation & Emulation Project	12	BAHI S900741BAH	FA8075 14 D 0002	0	31,844
Contribution to ACS Modeling, Simulation & Emulation Project	12	BAHI S900741BAH	FA8075 14 D 0002	0	31,000
Office of Naval Research					
Fast and Flexible Differential Equation Model Fitting with Application to Pharmacometrics	12	METRUM CU16-2364	N00014-16-P-2039	0	256,358
Enhancements to YOLO Cyber-Resilience Techniques	12	CMU 17-00491-SUB-00	FA8702-15-D-0002	0	144,858
Enhancements to YOLO Cyber-Resilience Techniques	12	CMU 17-00491-SUB-00	FA8702-15-D-0002	0	40,577
				\$0	\$6,046,225
Basic and Applied Scientific Research					
ABIDES: Adaptive Blnary DEbloating and Security	12.300	SIT 2102747-02	N00014-17-1-2788	0	267,761
Carbon-based Hierarchically Integrated Synthetic Electronics (CHISEL)	12.300	UCB 00009293	N00014-16-1-2921	0	125,526
Next Generation Time-of-Flight Imaging	12.300	UWIMAD 696K662	N00014-16-1-2995	0	87,071
				\$0	\$480,358
Scientific Research - Combating Weapons of Mass Destruction					
Investigation of Radiation Resistance Mechanisms in Melanized Fungi	12.351	USASK CU17-1613	HDTRA1-15-0058	0	60,455
Exogenous regulation of acute lung injury	12.351	CM00002024-00	HDTRA11810049	0	40,900
				\$0	\$101,355
Military Medical Research and Development					
Direct 3D Printing of Integrated Electro Mechanical Systems	12.420	IMOD P.O.#444/0729085	DOD CU15-3453	0	73,488

Federal Grantor / Pass-through Grantor	CFDA	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures (Includes Subrecipients)
Direct 3D Printing of Integrated Electro Mechanical Systems	12.420	IMOD P.O.#444/0729085	DOD CU15-3453	0	(includes Subrecipients) 57,672
Investigation of the NMDA Antagonist Ketamine as a Treatment for Tinnitus	12.420	RFMH 26965	W81XWH1810221	0	53,540
Novel targeted therapies for inflammatory breast cancer	12.420	ISMMS 0258-0901-4609	W81XWH-16-1-0461	0	37,096
LAM Pilot study with Imatinib Mesylate (LAMP-1)	12.420	MUSC14-051	W81XWH-14-1-0132	0	28,579
Prostate Cancer Clinical Consortium Clinical Research Site: TargetedTherapies	12.420	CUMC 180737	W81XWH1820032	0	28,500
Novel targeted therapies for inflammatory breast cancer	12.420	ISMMS 0258-0901-4609	W81XWH-16-1-0461	0	26,103
RAGE/Diaph1, Diabetes, and Kidney Disease: Mechanisms and Novel Therapeutic Strategies	12.420	NYUMC 17-AO-00-007334-01	W81XWH-17-1-0201	0	17,402
RAGE/Diaph1, Diabetes, and Kidney Disease: Mechanisms and Novel Therapeutic Strategies	12.420	NYUMC 17-AO-00-007334-01	W81XWH-17-1-0201	0	11,296
Whole Exome Analysis of Early Onset Alzheimer's Disease	12.420	UMIAMI SPC-000132	W81XWH1210013	0	11,138
CDK5- A Novel Role in Prostate Cancer Immunotherapy	12.420	JH 2003391776	W81XWH-15-1-0670	0	11,137
RAGE/Diaph1, Diabetes, and Kidney Disease: Mechanisms and Novel Therapeutic Strategies	12.420	NYUMC 17-A0-00-007334-01	W81XWH-17-1-0201	0	9,457
Beta-Blockers for the Prevention of Acute Exacerbations of COPD	12.420	CUMC 15040499	W81XWH-15-1 -0705	0	9,398
Association of Post traumatic Stress Disorder and Heart Disease in Women Veterans: Examining Risk Factors and Effects of Pharmacotherapy on Clinical Outcomes .	12.420	UCLA 1564 G WA504	W81XWH1810725	0	7,967
RAGE/Diaph1, Diabetes, and Kidney Disease: Mechanisms and Novel Therapeutic Strategies	12.420	NYUMC 17-A0-00-007334-01	W81XWH-17-1-0201	0	7,200
Beta-Blockers for the Prevention of Acute Exacerbations of COPD	12.420	CUMC 15040499	W81XWH-15-1 -0705	0	4,794
Beta-Blockers for the Prevention of Acute Exacerbations of COPD	12.420	CUMC 15040499	W81XWH-15-1 -0705	0	4,769
Effects of Traumatic Brain Injury (TBI) and Post Traumatic Stress Disorder (PTSD) on Alzheimer s Disease (AD) in Veterans Using Imaging and Biomarkers in the AD Neuroimaging Initiative (ADNI) (DoD)	12.420	USC 69091938	W81XWH-12-2-0012	0	636
Effects of Traumatic Brain Injury and Post-Traumatic Stress Disorder on Alzheimer s Disease (AD) in Veterans with Mild Cognitive Impairment (MC) using the Alzheimer s disease neuroimaging initiative (	12.420	USC 78227300	W81XWH-13-1-0259	0	11
c-jun-N-Terminal Kinase (JNK) for the treatment of amyotrophic lateral sclerosis	12.420	SRI 5-21306	W81XWH-12-1-0431	0	-11,363
				\$0	\$388,820

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

,					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Basic Scientific Research					
Multiscale Integration of Neural, Social, and Network Theory to Understand and Predict Transitions from Illness to Wellness: A Proof of Concept with Mindfulness, Hypnosis and Alcohol Use Disorders	12.431	UPENN 574211	W911NF1810244	0	304,862
Fractional PDEs for Conservation Laws and Beyond: Theory, Numerics and Applications	12.431	BROWN 00000825	W911NF1510562	0	224,500
Bio-inspired Design of Adaptive Catalysis Center	12.431	UUTAH10034220-04	W911NF-14-1-0263	0	182,287
Towards a Multi-Scale Theory on Coupled Human Mobility and Environmental Change	12.431	UFLRDA UFDSP00012221	W911NF1810267	0	108,366
Physical behavior of layered superatomic crystals	12.431	CMU 1130214-394149	W911NF-17-1-0397	0	79,733
Multivariate Heavy Tail Phenomena: Modeling, Diagnostics, and Applications in Tactical Operations	12.431	CU 66220-9900	W911NF-12-1-0385	0	58,485
Towards a Multi-Scale Theory on Coupled Human Mobility and Environmental Change	12.431	UFLRDA UFDSP00012221	W911NF1810267	0	43,278
Scalable Coherent Photonic Array on a Silicon Platform	12.431	TREX S20104	FA8650-19-C-1002	0	23,964
Scalable Coherent Photonic Array on a Silicon Platform	12.431	TREX S20104	FA8650-19-C-1002	0	12,719
Decentralized Methods for Multi-Agent Problems Over Networks	12.431	PSU 5667-CU-USARL-0298	W911NF-17-1-0298	0	-12,068
				\$0	\$1,026,126
Basic, Applied, and Advanced Research in Science and Engineering					
Constructing Mutually-derived Situational Awareness via EEG-informed Graph Based Transductive Inference	12.630	APX02-N004	W911-NF-10-2-0022	0	402,463
Climate-informed Estimation of Hydrologic Extremes for Robust Adaptation to Non-s	12.630	16-009040 A 00	W912HQ-15-C-0052	0	96,966
Constructing Mutually-derived Situational Awareness via EEG-informed Graph Based Transductive Inference	12.630	APX02-N004	W911-NF-10-2-0022	0	7,591
				\$0	\$507,020
Air Force Defense Research Sciences Program					
Active Metasurfaces for Advanced Wavefront Engineering and Waveguiding	12.800	HARVARD-123885-5079402	FA9550-14-1-0389	0	235,659
Magnet-Free Non-Reciprocal Metamaterials Based on Spatio-Temporal Modulation	12.800	RFCUNY CM00001529-00	FA9550-18-1-0379	0	229,096

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Functional Testing Development for Automated Scaled Manufacturing	12.800	RFSUNY CU15-1693	FA8650-15-2-5220	0	(Includes Subrecipients) 206,121
Very High Speed Digital Data and Communication Links	12.800	RFSUNY CU16-1030	AFOSR CU16-1030	0	189,075
MURI Center for Material Failure Prediction through peridynamics	12.800	UOARIZONA-PO225829	FA9550-14-1-0073	0	186,873
Harnessing Strong-Field Mid-Infrared (IR) Lasers: Designer Beams of Relativistic Particles and THz-to-X-ray Light	12.800	UCB 1553896	FA9550-16-1-0121	0	182,669
Functional Testing Development for Automated Scaled Manufacturing	12.800	RFSUNY CU15-1693	FA8650-15-2-5220	0	117,913
TAP Process Development 2018 (Rochester HUB)	12.800	RFSUNY CU18-1149	AFOST CU18-1149	0	99,807
Magnet-Free Non-Reciprocal Metamaterials Based on Spatio-Temporal Modulation	12.800	RFCUNY CM00001529-00	FA9550-18-1-0379	0	56,927
Compact CMOS-Compatible Opitcal Transceiver	12.800	PSI SC-1920-001	FA9550-16-C-0042	0	1,484
Hydrogen Storage via Functionalizad Nanoporous Materials	12.800	UTEXAS FA9550-12-1-0159-03	FA9550-12-1-0159	0	102
Functional Testing Development for Automated Scaled Manufacturing	12.800	RFSUNY CU15-1693	FA8650-15-2-5220	0	-4,991
				\$0	\$1,500,735
Research and Technology Development					
Generating Alternatives for Interpretation and Analysis (GAIA)	12.910	USC 98328001	FA8750-18-2-0014	0	469,464
DECADES: Deeply-Customized Accelerator-Oriented Data Supply Systems Synthesis	12.910	PU SUB0000254	FA8650-18-2-7862	0	258,061
Generating Alternatives for Interpretation and Analysis (GAIA)	12.910	USC 98328001	FA8750-18-2-0014	0	168,043
Continual Learning Across Synapses, Circuits, and Brain Areas	12.910	BRI 7000000603	HR0011-18-2-0025	0	134,396
Chip-Scale Optical Planar LADAR Architecture (COPLA)	12.910	JASR 703-02	FA8650-19-C-7916	0	114,533
Automated System for Knowledge-based Continuous Organic Synthesis (ASKCOS)	12.910	MIT 57100004124	W911NF-16-2-0023	0	99,585
Chip-Scale Optical Planar LADAR Architecture (COPLA)	12.910	JASR 703-02	FA8650-19-C-7916	0	75,010
Diamond Micro-Combs and Applications	12.910	HARVARD 123926-5097294	W31P4Q-15-1-0013	0	24,806

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Memory Enhancement with Modeling, electrophysiology, and simulation (MEMES)	12.910	UPENN 564000/569456	N66001-14-2-4032	0	2,782
ŻeD: Zero-Knowledge Discovery Using Data Smashing	12.910	UCHICA FP064753-A	FA8750-17-2-0124	0	-75,406
				\$0	\$1,271,274
Total Pass-through Programs				\$0	\$11,321,913
Total: Department of Defense				\$7,338,424	\$48,475,498
Department of Commerce					
Direct Awards					
National Oceanic & Atmospheric Administration/Department of Commerce					
Rolling Deck to Repository (R2R0 Catalog Services for the NOAA Fleet a prototype	11	NEEH3000-14-00627		0	52
				\$0	\$52
Climate and Atmospheric Research					
IRAP: Integrating Climate Information and Decision Processes for regional Climate Resilience	11.431	NA13OAR4310184		508,557	662,028
Supporting Regional Implementation of Integrated Climate Resilience: Consortium for Climate Risk in the Urban Northeast Phase II	11.431	NA15OAR4310147		514,422	656,700
The Relationship of Tropical Cyclones to MJO and ENSO in the \$2S Database	11.431	NA16OAR4310079		0	163,408
Interpolation of Subsurface Ocean Properties and Indices of Climate Variability	11.431	NA17OAR4310156		0	145,119
Drought Onset and Termination across North America: Mechanisms and Predictability	11.431	NA17OAR4310126		0	137,123
Biosphere-atmosphere regulations of droughts assessed using microwave and solar-induced fluorescence observations and improved plant water stress representation	11.431	NA17OAR4310127		0	136,527
Madden Julian Oscillation - the Maritime Continent barrier and seamless verification	11.431	NA16OAR4310076		0	91,146
Weather-Type Based Cross-Timescale Diagnostics of CMIP6-Era Models	11.431	NA18OAR4310275		0	90,521
Testing, Refinement and Demonstration of Probabilistic Multi-Model, Calibrated Subseasonal Global Forecast Products	11.431	NA18OAR4310295		0	77,056

ederal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster <u>Total Expenditures</u>
The Relationship of Tropical Cyclones to MJO and ENSO in the S2S Database	11.431	NA16OAR4310079		0	(Includes Subrecipients) 60,888
The Development of Climate-Informed Decision-Support Tools for the Prevention and Control of Aedes-Borne Diseases in the US and Transboundary Regions	11.431	NA18OAR4310339		0	43,226
Process Oriented Diagnostics of Tropical Cyclones in Climate Models	11.431	NA15OAR4310095		0	40,75
Developing a Real-Time Multi-Model Sub-seasonal Predictive Capability	11.431	NA16OAR4310145		0	33,956
Supporting Regional Implementation of Integrated Climate Resilience: Consortium for Climate Risk in the Urban Northeast Phase II	11.431	NA15OAR4310147		0	31,30
Supporting Regional Implementation of Integrated Climate Resilience: Consortium for Climate Risk in the Urban Northeast Phase II	11.431	NA15OAR4310147		0	31,080
Evaluating How Dry Deposition Influences Eastern U.S. Ozone. Aerosols, and Precursors: Mean Contributions, Uncertainties, and Spatio-Temporal Variability From Weather, Regional Climate, and Land Use	11.431	NA14OAR4310133		0	31,003
Madden Julian Oscillation - the Maritime Continent barrier and seamless verification	11.431	NA16OAR4310076		0	16,026
The Dynamical Machanisms and Potential Predictability of Indian and Pacific Ocean Influences on Seasonal North American Draught	11.431	NA14OAR4310232		0	15,27
Developing a Real-Time Multi-Model Sub-seasonal Predictive Capability	11.431	NA16OAR4310145		0	6,083
Supporting Regional Implementation of Integrated Climate Resilience: Consortium for Climate Risk in the Urban Northeast Phase II	11.431	NA15OAR4310147		0	2,038
				\$1,022,979	\$2,471,259
pplied Meteorological Research					
Development and Evaluation of New Statistical Calibration Methods for Multi-Model Ensemble Week 3-4 Probabilistic Forecasts	11.468	NA18NWS4680067		0	131,433
Weather regime diagnostic tools for sub-monthly ensemble forecasts	11.468	NA16NWS4680014		0	38,246
Development and Evaluation of New Statistical Calibration Methods for Multi-Model Ensemble Week 3-4 Probabilistic Forecasts	11.468	NA18NWS4680067		0	30,876
Weather regime diagnostic tools for sub-monthly ensemble forecasts	11.468	NA16NWS4680014		0	26,895
				\$0	\$227,450
enter for Sponsored Coastal Ocean Research Coastal Ocean Program					
Resolving the Effects of Resource Availability, Predation and Competition on Brown Tide Dynamics using Metatranscriptomics	11.478	NA15NOS4780199		0	59,803

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
				\$0	\$59,803
Measurement and Engineering Research and Standards					
Experimentally-driven mapping of QoS-to-QoE for Mission-Critical Voice	11.609	70NANB19H003		0	5,879
				\$0	\$5,879
Science, Technology, Business and/or Education Outreach					
FY 2018 Summer Undergraduate Research Fellowship MML, CNST	11.620	70NANB18H062		0	14,119
				\$0	\$14,119
Total Direct Award Programs				\$1,022,979	\$2,778,562
Pass-through Awards					
National Oceanic & Atmospheric Administration/Department of Commerce					
High-resolution Shipboard Measurements of Phytoplankton Functional Types, Size Classes and Photosynthetic Competency in Support of SUOMI-VIIRS Ocean Color Observations	11	GSTI SA18-CUNY01	ST-1330-17-CQ-0050	0	83,200
NOAA-ISC Telepresence Support	11	URI 043117/0006278	WC133R17SU0143	0	5,824
High-resolution Shipboard Measurements of Phytoplankton Functional Types, Size Classes and Photosynthetic Competency in Support of SUOMI-VIIRS Ocean Color Observations	11	GSTI SA14-CUNYC01-002-002	DG133E-10-CQ-0034	0	-617
				\$0	\$88,407
Ocean Exploration					
Data Services for E/V Nautilus	11.011	OET 60110-2	NA17OAR0110336	0	42,447
				\$0	\$42,447
Climate and Atmospheric Research					
Weddell Sea Moorings	11.431	UCAR SUBAWD001040	NA18OAR4310253B	0	99,841
Monitoring the Indonesian Throughflow in Makassar Strait	11.431	UCAR SUBAWD000430	NA16OAR4310253	0	62,724
Monitoring the Indonesian Throughflow and Weddell Sea Deep and Bottom Water Outflow	11.431	UCAR SUBAWD000363	NA160AR4310253	0	47,169

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
From Precipitation Thresholds Identification to Planning Helping Communities Plan and Adapt to Future Extreme Events	11.431	UCONN 126959	NA16OAR4310124	0	21,504
Integrating Seasonal and Sub-Seasonal Climate Information into Public Health Contexts: Co-Producing Decision Support Applications in Puerto Rico and Dominica	11.431	UA 470206	NA18OAR4310338	0	10,49
From Precipitation Thresholds Identification to Planning Helping Communities Plan and Adapt to Future Extreme Events	11.431	UCONN 126959	NA16OAR4310124	0	898
Monitoring the Indonesian Throughflow and Weddell Sea Deep and Bottom Water Outflow	11.431	UCAR No. Z14-13996	NA11OAR4310213	0	-63
				\$0	\$242,561
National Oceanic and Atmospheric Administration (NOAA) Cooperative Institu	ıtes				
Surface Water pCO2 measurements from Ships	11.432	UMIAMI SPC-000138	NA15OAR4320064	0	232,200
Continuation of the North American Multi-Model Ensemble (NMME)	11.432	UMIAMI SPC-000885	NA15OAR4320064	0	21,209
Sub X Continuation	11.432	UMIAMI SPC-000884	NA15OAR4320064	0	18,470
				\$0	\$271,879
Total Pass-through Programs				\$0	\$645,294
Total: Department of Commerce				\$1,022,979	\$3,423,856

#### **Department of Education**

#### **Direct Awards**

National Resource Centers Program for Foreign Language and Area Studies or Foreign Language and International Studies Program and Foreign Language and Area Studies Fellowship Program

Foreign Language and Area Studies Fellowships	84.015	P015B140115-17	105,845	110,845
Columbia South Asia Institute: National Resource Centers	84.015	P015A180034 - 19	0	108,401
CU-NYU Latin American & Caribbean Studies Consortium Project	84.015	P015A180149 - 19	54,121	84,511
Columbia South Asia Institute: National Resource Centers	84.015	P015A180034 - 19	0	40,996
National Resource Centers	84.015	P015A140110-17	0	31,377

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
National Resource Centers	84.015	P015A140115-17		16,316	(Includes Subrecipients) 23,841
Columbia South Asia Institute: National Resource Centers	84.015	P015A180034 - 19		0	20,766
Columbia South Asia Institute: National Resource Centers	84.015	P015A180034 - 19		0	17,309
National Resource Center	84.015	P015A140111-17		0	15,693
Foreign Language and Area Studies Fellowships	84.015	P015B140108-17		0	15,641
CU-NYU Latin American & Caribbean Studies Consortium Project	84.015	P015A180149 - 19		0	14,089
National Resource Centers	84.015	P015A140115-17		0	9,126
National Resource Center	84.015	P015A140111-17		0	7,950
Columbia South Asia Institute: National Resource Centers	84.015	P015A180034 - 19		0	7,317
ĆU-NYU Latin American & Caribbean Studies Consortium Project	84.015	P015A180149 - 19		0	6,230
National Resource Centers	84.015	P015A140115-17		0	4,018
Foreign Language and Area Studies Fellowships	84.015	P015B140111-17		0	2,746
Foreign Language and Area Studies Fellowships	84.015	P015B140110-17		0	2,131
National Resource Centers	84.015	P015A140115-17		0	516
				\$176,282	\$523,503
Overseas Programs - Doctoral Dissertation Research Abroad					
FY2017 Fulbright-Hays Doctoral Dissertation Research Abroad	84.022	P022A170038		0	36,880
FY2018 Fulbright-Hays Doctoral Dissertation Research Abroad	84.022	P022A180045		0	24,342
				\$0	\$61,222

**Education Research, Development and Dissemination** 

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Learning from Errors	84.305	R305A150467-17		0	343,16
Solving Difficult Bayesian Computation Problems in Education Research Using STAN	84.305	DE R305D140059-16		32,951	32,95
				\$32,951	\$376,110
Total Direct Award Programs				\$209,233	\$960,84
Total: Department of Education				\$209,233	\$960,84
Department of Agriculture					
Direct Awards					
Agricultural Research Basic and Applied Research					
Harnessing natural cariation in the ability of the Asian citrus psylid to transmit Liberibacter for the development of novel HLB	10.001	USDA 59-8062-6-012		0	65,49
				\$0	\$65,490
International Forestry Programs					
Puerto Rico Forest Disturbance and Regrowth Data Collection	10.684	USFS 19-DG-11132762-045		0	7,12
				\$0	\$7,128
Total Direct Award Programs				\$0	\$72,618
Pass-through Awards					
1890 Institution Capacity Building Grants					
A Modeling Approach in Climate Change and Natural Resource Education	10.216	SUAMC OSP-02-8300-2016-0016	USDA 2017-38821-26444	0	7,86
				\$0	\$7,86°
Consumer Data and Nutrition Research				·	, ,,,
Intergenerational transmission of food insecurity and the role of food assistance programs in					
moderating the transmission of food insecurity across generations	10.253	UKRF 3200000900-17-239	58-4000-6-0059-R	0	13,81
				\$0	\$13,81

Agriculture and Food Research Initiative (AFRI)

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Nitrogen Transformations in Aquaponic Systems	10.310	RCUH MA1020	2013-67019-21376	0	-1
				\$0	\$-1
Total Pass-through Programs				\$0	\$21,675
Total: Department of Agriculture				\$0	\$94,293
Department of Homeland Security					
Direct Awards					
State and Local Homeland Security National Training Program					
Addressing Gaps in Housing Disaster Recovery: A Training Program for the Whole Community	97.005	EMW-2017-CA-00043-S01		0	361,586
Economic Recovery from Disasters Training Program	97.005	EMW-2016-CA-00123-S01		0	297,594
				\$0	\$659,180
Total Direct Award Programs				\$0	\$659,180
Pass-through Awards					
Centers for Homeland Security					
Center of Excellence for Emerging and Zoonotic Animal Disease (CEEZAD)	97.061	KSUNI S11045.06	2010-ST-061-AG0001	0	-778
				\$0	\$-778
Total Pass-through Programs				\$0	\$-778
Total: Department of Homeland Security				<u>\$0</u>	\$658,402
Department of Interior					
Direct Awards					
U.S. GEOLOGICAL SURVEY/DEPARTMENT OF THEINTERIOR					
Boron Isotope Analyses in Benthic Foraminifera Shells	15	140G0118P0314		0	13,860
Measurement of Tritum, Helium, Neon, 3He/4He and Noble Gases in Ground Water Samples	15	USGS G15PC00070		0	64

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
				\$0	\$13,924
Water Desalination Research and Development					
Improved Energy Efficiency of Electrodialysis Desalination and Separation:Development of Percolating Network Nanocomposite Ion-Exchange Membranes for High Conductivity	15.506	DIBR R16AC00124		0	26,252
				\$0	\$26,252
Earthquake Hazards Program Assistance					
Operation of the Lamont Cooperative Seismographic Network and the Northeastern United States Earthquake Data Center	15.807	USGS G15AC00045		0	198,410
Operation of the Lamont Cooperative Seismographic Network and the Northeastern United States Earthquake Data Center	15.807	USGS G15AC00045		0	91,328
Operation of the Lamont Cooperative Seismographic Network and the Northeastern United States Earthquake Data Center	15.807	USGS G15AC00045		0	30,106
				\$0	\$319,844
U.S. Geological Survey Research and Data Collection					
A Guide to Natural Hazards Communication	15.808	USGS G15AC00449		0	5,601
				\$0	\$5,601
Total Direct Award Programs				\$0	\$365,621
Pass-through Awards					
Department of the Interior					
Creation of Operationally Realistic 3D Environment (CORE3D)	15	KITWARE K002037-00-S01	D17PC00286	0	134,393
				\$0	\$134,393
Earthquake Hazards Program Assistance					
SCEC5 Year 2 Research Collaboration at Columbia University	15.807	USC 104658436	G17AC00047	0	30,000
				\$0	\$30,000
National and Regional Climate Adaptation Science Centers					
A Proposal to the Department of the Interior to Establish the Northeast Climate Science Center	15.820	UMASS 12-007036 D 15	G12AC00001	0	67,633

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
Examining the Mechanisms of Species Responses to Climate Change: Are there Biological Thresholds?	15.820	UMASS 17-009638 B 02	G16AC00256	0	(Includes Subrecipients) 16,781
A Proposal to the Department of the Interior to Establish the Northeast Climate Science Center	15.820	UMASS 12-007036 D 15	G12AC00001	0	11,792
Examining the Mechanisms of Species Responses to Climate Change: Are there Biological Thresholds?	15.820	UMASS 17-009638 B 02	G16AC00256	0	4,717
				\$0	\$100,923
Cooperative Research and Training Programs – Resources of the National Pa	ark System				
Metrics for general circulation model biases in extratropical cyclone clouds and precipitation: evaluating their skill and identifying processes to be improved	15.945	RFCUNY 49300A	NA15OAR4310094	0	34,020
				\$0	\$34,020
Total Pass-through Programs				\$0	\$299,336
Total: Department of Interior				<b>\$0</b>	\$664,957
Department of Justice					
Pass-through Awards					
National Institute of Justice Research, Evaluation, and Development Project	Grants				
Space-time study of youth and school violence	16.560	UPENN 565802	2014-CK-BX-0008	0	57,583
				\$0	\$57,583
Total Pass-through Programs				\$0	\$57,583
Total: Department of Justice				<u> </u>	<b>\$57,583</b>
Department of State					
Pass-through Awards					
International Programs to Support Democracy, Human Rights and Labor					
CASEDATA Initiative: Coordinating Approaches to Systematize & Expand Digital Rights Datasets And Taxonomies to Enhance Advocacy	19.345	SMEX DRL176-18-102	DS S-LMAQM-18-GR-2092	0	24,810
				\$0	\$24,810
Total Pass-through Programs				\$0	\$24,810
Total: Department of State				\$0	\$24,810

For year ended June 30, 2019

- 01 year ended suite 50, 2015					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Department of Transportation					
Pass-through Awards					
Highway Research and Development Program					
Inspection and Evaluation of Suspension Bridge Cables	20.200	MM CU18-2437	DTFH61-13-H-00024	0	23,378
				\$0	\$23,378
Iniversity Transportation Centers Program					
Center for Advanced Infrastructure and Transportation (CAIT) Regional UTC Consortium	20.701	RUTGER PO 966112/PID#824227	7 DOT 69A3551847102	0	57,388
				\$0	\$57,388
otal Pass-through Programs				\$0	\$80,766
Total: Department of Transportation				\$0	\$80,766
Department of Veterans Affairs					
Direct Awards					
Department of Veterans Affairs					
Neuronal Subtype Specific Epigenetic Regulation in Schizophrenia	64	DVAMC CU16-3298		0	3,807
Neuronal Subtype Specific Epigenetic Regulation in Schizophrenia	64	DVAMC CU16-3298		0	3,026
JAMES J PETERS VA MEDICAL CENTER					
Neuroinflammatory and Epigenetic Mechanisms of Blood-Brain Barrier Compromise in Suicide	64	JJPVA 36C24E18D0058		0	62,494
				\$0	\$69,327
Total Direct Award Programs				\$0	\$69,327
Total: Department of Veterans Affairs				\$0	\$69,327

**Dept. of HousingUrban Development** 

**Direct Awards** 

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subraginianta	R&D Cluster  Total Expenditures
r Cacrai Granioi / 1 ass anough Granioi	CFDA	<u>FTOJECT NO</u>	rass-tillough Contract Number	<u>Subrecipients</u>	(Includes Subrecipients)
General Research and Technology Activity					
Understanding the Market for Reverse Mortgages	14.506	HUD RP-14-NY-002		0	-85,600
					ф. от coo
				\$0	\$-85,600
Fransformation Initiative: Rental Assistance Demonstration Small Research G	rant Progra	am			
Examining the Impact of Rental Assistance Demonstration on Children Living in Public Housing Communities	14.535	HUD H-21666CA		0	-2,999
				\$0	\$-2,999
Healthy Homes Technical Studies Grants					
Smoke-Free Living: Evaluating Compliance and Refining Enforcement of Smoke-free Housing Policy in Low-Income Multiple Unit Housing	14.906	NYHHU0034-16		35,471	130,672
Urban fungal exposure, sensitization and asthma among a low-income population	14.906	NYHHUOO42-18		0	126,299
Fungal Exposure in N.Y.C. Low-Income Housing Pre-and Post- Intervention	14.906	NYHHU0030-15		42,741	109,251
				\$78,212	\$366,222
Total Direct Award Programs				\$78,212	\$277,623
Total: Dept. of HousingUrban Development				\$78,212	\$277,623
Environmental Protection Agency					
Direct Awards					
Science To Achieve Results (STAR) Research Program					
Quantifying Risks From Changing U.S. PM2.5 Distributions Due to Climate Variability and Warming with Large Multi-Model Ensembles and High-Reolution Donscaling	66.509	EPA RD-83587801-5		83,748	219,182
The Columbia Center for Children s Environmental Health	66.509	EPA 83615401		0	154,946
The Columbia Center for Children's Environmental Health	66.509	EPA 83615401		0	149,299
The Columbia Center for Children's Environmental Health	66.509	EPA 83615401		0	102,178

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients
The Columbia Center for Children s Environmental Health	66.509	EPA 83615401		19,425	72,40
The Columbia Center for Children's Environmental Health	66.509	EPA 83615401		0	32,12
				\$176,022	\$802,980
Science To Achieve Results (STAR) Fellowship Program					
Alternative Stable States in Nitrogen Fixer Abundance	66.514	EPA 91781501		0	18,96
				\$0	\$18,960
Total Direct Award Programs				\$176,022	\$821,940
Pass-through Awards					
Science To Achieve Results (STAR) Research Program					
The Multi-Ethnic Study of Atherosclerosis and Air Pollution (MESA Air): Next Stage	66.509	UWSC10109	838300001-0	0	56,51
				\$0	\$56,514
Office of Research and Development Consolidated Research/Training/Fello	wships				
Assessing Adverse Health Effects of Long-Term Exposure to Low Levels of Ambient Air Pollution	66.511	HARVARD 114500-5104310	EPA 83467701	0	49,11:
				\$0	\$49,112
Total Pass-through Programs				<u>\$0</u>	\$105,626
Total: Environmental Protection Agency				\$176,022	\$927,566
Federal Government					
Direct Awards					
Department of Treasury					
IPA Agreement	21	DT CU16-0793		0	-
				\$0	\$-
Total Direct Award Programs				\$0	\$-^
Total: Federal Government				\$0	\$-*

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Japan US Friendship Commission					
Direct Awards					
Japan-U.S. Friendship Commission Grants					
2018-2019 Japan-US Friendship Commission Prize for the Translation of Japanese Literature	90.300	JAPUS 18-23		0	7,254
2018-2019 Japan-US Friendship Commission Prize for the Translation of Japanese Literature	90.300	JAPUS 18-23		0	3,000
2016 -2017 The Japan-U.S. Friendship Commission Prize for the Translation of Japanese Literature	90.300	JAPUS 16-28		0	-99
The Japan-U.S. Friendship Commission Prize for the Translation of Japanese Literature	90.300	JAPUS 17-17		0	-1,312
				\$0	\$8,843
Total Direct Award Programs				\$0	\$8,843
Total: Japan US Friendship Commission				<u>\$0</u>	\$8,843
Nat. Endowment for the ArtsHumanities					
Direct Awards					
Promotion of the Humanities Fellowships and Stipends					
The Comedians of the King: Opera-Comique and the Bourbon Monarchy on the Eve of Revolution	45.160	NEH FEL-258019-18		0	28,925
				\$0	\$28,925
Promotion of the Humanities Research					
Craft Techniques and Knowledge Systems in a 16th-Century Artist's Manuscript: An Open-Access Critical Edition and Translation	45.161	NEH RQ-249842-16		0	92,758
Relocating Heart Disease in the Tropics: Race, and Modernization in Post-Independence India	45.161	RZ-51759-14		4,706	12,815
				\$4,706	\$105,573
National Leadership Grants					
Reverse Engineering the Image Library: the feasibility of using deep learning to identify significance in a 35mm slide collection	45.312	IMLS LG-89-17-0218-17		0	8,613

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	R&D Cluster  Total Expenditures
				<del></del>	(Includes Subrecipients) \$8,613
Total Direct Award Programs				\$4,706	\$143,111
Pass-through Awards					
Promotion of the Humanities Office of Digital Humanities					
Humanities CORE	45.169	MLA CU16-0295	HD-250665	0	36,244
Analyzing Large-Scale Data for Patterns in Jazz	45.169	UIL 087569-16852	HJ-253587-17	0	17,913
				\$0	\$54,157
Total Pass-through Programs				\$0	\$54,157
Total: Nat. Endowment for the ArtsHumanities				\$4,706	\$197,268
National Archives and Records Administration					
Direct Awards					
National Historical Publications and Records Grants					
The Selected Papers of John Jay, Year 15 (2018-2019)	89.003	NHPRC PE-100308-18		0	89,697
The Selected Papers of John Jay, Year 14 (2017-2018)	89.003	NHPRC PE-100093-17		0	33,326
				\$0	\$123,023
Total Direct Award Programs				\$0	\$123,023
Total: National Archives and Records Administration				\$0	\$123,023
Nuclear Regulatory Commission					
Direct Awards					
U.S. Nuclear Regulatory Commission Scholarship and Fellowship Program	1				
Faculty Development Program in Probabilistic Low-D	77.008	NRC-HQ-84-16-G-0013		0	198,994
				\$0	\$198,994
Total Direct Award Programs				<del></del>	\$198,994

For year ended June 30, 2019

<u> </u>					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Total: Nuclear Regulatory Commission				<u> </u>	\$198,994
Other Agencies / Gov't					
irect Awards					
ONSUMER FINANCIAL PROTECTION BUREAU					
Consumer Financial Protection Bureau-Mobility	99	CFPB CU14-3714		0	-4
ANSAS STATE UNIVERSITY					
Immunogens of high impact livestock pathogens	99	KSU-1048		0	51,531
				\$0	\$51,527
otal Direct Award Programs				\$0	\$51,527
ass-through Awards					
mall Business Development Centers					
SBDC-RFSUNY FY2018	59.037	RFSUNY 82763	SBA1142365	0	277,721
The New York Small Business Development Center (NY SBDC)	59.037	RFSUNY 79337	SBA1142365	0	64,762
				\$0	\$342,483
EDERAL EMERGENCY MANAGEMENT AGENCY					
The New York City Panel on Climate Change: Mapping and Measuring Risk	97.045	NYCOEM CU17-0642	EMN-2016-CA-00002-S01	0	43,620
				\$0	\$43,620
otal Pass-through Programs				\$0	\$386,103
otal: Other Agencies / Gov't				\$0	\$437,630

**Social Secuirty Administration** 

Pass-through Awards

**Social Security Administration/DHHS** 

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Early Intervention Mental Health Demonstration Study	96	WESTAT 6464-S02	SS001660014	0	115,054
				\$0	\$115,054
Total Pass-through Programs				\$0	\$115,054
Total: Social Secuirty Administration				<b>\$0</b>	\$115,054
United States Agency for International Dvlpt.					
Direct Awards					
USAID Foreign Assistance for Programs Overseas					
Combination Intervention Strategy For Linkage And Retention - Mozambique (NY)	98.001	AID-OAA-A-12-00027		0	-6,110
				\$0	\$-6,110
Total Direct Award Programs				\$0	\$-6,110
Pass-through Awards					
U.S. Agency for International Development					
SERVIR for USAID West Africa	98	TETRARD 1865-Columbia-001	AID-OAA-I-13-00058	0	127,210
West Africa Biodiversity and Climate Change	98	TETRAARD 1861-CIESIN-000-001	AID-OAA-I-13-0058	0	80,722
Improving Climate Services for Resilient Development (CSRD) in Colombia	98	CIAT C-136-16	USAID CU16-3371	0	72,689
Climate Data and Information for Resilient Development	98	CIAT C-048-18	AID CU18-2896	0	54,954
SERVIR Amazonia	98	CIAT C-018-19	AID CU18-2597	0	26,652
USAID Municipal Waste Recycling Program Proposed SOW for CSUD Earth Institute	98	DIG CU16-1664	USAID CU16-1664	0	-1,670
				\$0	\$360,557
USAID Foreign Assistance for Programs Overseas					
PREDICT-2 Davis	98.001	UCD 201403200-09	AID-OAA-A-14-00102	0	545,903

For year ended June 30, 2019

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Predict 2	98.001	ECOHA PREDICT 2	AID CU15-0064	0	463,561
Predict 2	98.001	ECOHA PREDICT 2	AID CU15-0064	0	461,989
PREDICT-2 Davis	98.001	UCD 201403200-09	AID-OAA-A-14-00102	0	340,425
Elucidation of Genetic Markets to Detect P. falciparum Resistance to MMV-Supported Antimalarials (Enabling Technologies)	98.001	MMV CU09-1816	AID CU09-1816	0	332,285
Simplification of Linkage to and Delivery of Antiretroviral Therapy in USAID-PEPFAR Supported Programs	98.001	WHC D1509970	AID-OAA-A-15-0069	0	298,775
Developing Acute Care and Emergency Referral Systems	98.001	CATHOLICRS CU 18-2493	7200AA18CA00051	0	213,439
Simplification of Linkage to and Delivery of Antiretroviral Therapy in USAID-PEPFAR Supported Programs	98.001	WHC D1509970	AID-OAA-A-15-0069	0	148,166
Climate Services for Agriculture-Rwanda	98.001	CIAT C-165-15	USAID CU15-3757	0	127,911
Simplification of Linkage to and Delivery of Antiretroviral Therapy in USAID-PEPFAR Supported Programs	98.001	WHC D1509970	AID-OAA-A-15-0069	0	120,516
Toward a Learning Agenda: Generating knowledge and evidence for CIS design and implementation	98.001	MERCY IRI-COLUMBIA CISRI 32946	6 AID-OAA-A-16-0072	0	101,455
Climate Services for Resilient Development (CSRD) in South Asia and Bangladesh	98.001	CIMMYT CU17-2016	USAID CU17-2016	0	100,130
CHPS+FP: An innovative and scalable intervention for increasing contraceptive use in Ghana	98.001	FY16-CR06-6017	AID-641-A-14000002	57,084	57,084
Climate Services for Africa	98.001	CIAT C-009-16	USAID CU16-0337	0	52,264
Simplification of Linkage to and Delivery of Antiretroviral Therapy in USAID-PEPFAR Supported Programs	98.001	WHC D1509970	AID-OAA-A-15-0069	0	50,139
Simplification of Linkage to and Delivery of Antiretroviral Therapy in USAID-PEPFAR Supported Programs	98.001	WHC D1509970	AID-OAA-A-15-0069	0	43,503
Understanding the Mechanism of Arsenic and Fluoride and Reducing Exposure by Targeting Low Arsenic and Fluoride Aquifers in Rural Punjab, Pakistan	98.001	NAS 2000006111	ESP-A-00-05-00001-00	0	32,781
Simplification of Linkage to and Delivery of Antiretroviral Therapy in USAID-PEPFAR Supported Programs	98.001	WHC D1509970	AID-OAA-A-15-0069	0	31,221
Assessing Sustainability and Effectiveness of Climate Information Services in Africa (CIS)	98.001	WINRK 6776-17-AM-01	AID-OAA-A-16-00056	0	12,383
Predict 2	98.001	ECOHA PREDICT 2	AID CU15-0064	0	-928
PREDICT-2 Davis	98.001	UCD 201403200-09	AID-OAA-A-14-00102	0	-1,236

					R&D Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Integrated HIV/AIDS Program (IHAP)	98.001	AID.2179-01542564-PAL	AID-660-A-17-00001	0	-1,890
				\$57,084	\$3,529,876
Global Development Alliance					
Satellite Technologies, Innovative and Smart Financing for Food Security (SATISFy)	98.011	IFPRI 2016X375.CUN	AID-OAA-A-14-00022	0	-5
				\$0	\$-5
Total Pass-through Programs				\$57,084	\$3,890,428
Total: United States Agency for International Dvlpt.				\$57,084	\$3,884,318
Total: Research & Development Cluster				\$103,628,603	\$746,164,959

#### The Trustees of Columbia University in the City of New York

#### Schedule of Expenditures of Federal Awards

				Student F	inancial Aid Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Student Financial Assistance Cluster					
Department of Health & Human Services					
Direct Awards					
Health Professions Student Loans, Including Primary Care Loans/	Loans for Disadvantag	ed Students			
Health Professionals	93.342			0	10,138,777
				\$0	\$10,138,777
Nursing Student Loans					
Nursing Students	93.364			0	1,100,399
				\$0	\$1,100,399
Total Direct Award Programs				\$0	\$11,239,176
Total: <b>Department of Health &amp; Human Services</b> (Excludin	g NIH)			<u>\$0</u>	\$11,239,176
Department of Education					
Direct Awards					
Federal Supplemental Educational Opportunity Grants					
Federal Supplemental Education Opportunity Grant(FSEOG) 2016-2017	84.007	P007A182737		0	1,117,634
				\$0	\$1,117,634
Federal Work-Study Program					
Federal Work Study 2018-2019	84.033	P033A182737		0	7,289,142
				\$0	\$7,289,142
Federal Perkins Loan Program					
Federal Perkins Loans	84.038			0	50,686,881

Tor year ended suite 50, 2015				Student F	inancial Aid Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
				\$0	\$50,686,881
Federal Pell Grant Program					
Federal Pell Grant Program 2017-2018	84.063	P063P181840		0	9,995,171
				\$0	\$9,995,171
Federal Direct Student Loans					
Federal Direct Loan Program 2019/2020	84.268	P268K201840		0	291,099,004
				\$0	\$291,099,004
Total Direct Award Programs				\$0	\$360,187,832
Total: Department of Education				\$0	\$360,187,832
Total: Student Financial Assistance Cluster				\$0	\$371,427,008

For year ended June 30, 2019

Total: Child Care & Development Fund Cluster

Tor year ended Julie 30, 2013				Child Care De	evelopment Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures (Includes Subrecipients)
Child Care & Development Fund Cluster					
Department of Health & Human Services					
Direct Awards					
Child Care and Development Block Grant					
Child Care and Early Education Research Connections - ACF	93.575	90YE0143-05-03		554,495	865,518
Child Care and Early Education Research Connections - ACF	93.575	90YE0143-05-03		0	-2,146
				\$554,495	\$863,372
Total Direct Award Programs				\$554,495	\$863,372
Total: Department of Health & Human Services (Exclud	ling NIH)			\$554.495	\$863,372

\$554,495

\$863,372

For year ended June 30, 2019

<u> </u>					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Global Aids					
Department of Health & Human Services					
Direct Awards					
Global AIDS					
Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique under PEPFAR	93.067	5NU2GGH001944-04-00		0	18,597,676
Community-Based HIV Services for Key Populations and Adolescent Girls and Young Women	93.067	5NU2GGH001941-04-00		212,366	13,562,277
Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique under PEPFAR	93.067	5NU2GGH001944-04-00		0	8,194,596
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	8,123,792
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	8,115,582
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	7,823,696
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		3,001,348	7,775,889
Increase Access to Comprehensive HIV/AIDS Prevention, Care and Treatment Services in the Democratic Republic of Congo under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001351-05-00		386,721	7,435,668
Implementation of Programs for the Prevention, Care and Treatment of HIV/AIDS in the Republic of Cote d Ivoire under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	6NU2GGH002015-02-05		928,184	6,822,756
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		687,914	5,636,333
Éthiopia Technical Assistance 1036 (NY)	93.067	6NU2GGH001036-05-05		399,564	5,543,064
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		3,420,156	5,533,437
Community-Based HIV Services for Key Populations and Adolescent Girls and Young Women	93.067	5NU2GGH001941-04-00		307,324	4,599,491
Technical Assistance to Ethiopia s Federal Ministry of Health and Regional Health Bureaus in Comprehensive HIV/AIDS Programming and Direct Site-Level Support in the Four Emerging Regions under PEPFAR	93.067	5NU2GGH002156-02-00		37,976	4,117,856
Śwaziland - Quality-Assured (NY)	93.067	5NU2GGH001433-05-00		136,867	3,942,334
Increase Access to Comprehensive HIV/AIDS Prevention, Care and Treatment Services in the Democratic Republic of Congo under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001351-05-00		506,953	3,191,288

For year ended June 30, 2019

					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
South Sudan Scale-Up (NY)	93.067	5NU2GGH001335-05-00		0	2,832,656
Community-Based HIV Services for Key Populations and Adolescent Girls and Young Women	93.067	5NU2GGH001941-04-00		126,925	2,657,906
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	2,367,895
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	2,112,578
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	2,016,529
Swaziland HIV/TB Lab (NY)	93.067	5NU2GGH001307-05-00		0	1,991,077
Supporting the Provision of High Quality, Comprehensive, and Sustainable HIV Services in National Teaching and Referral Hospitals in the Republic of Kenya under PEPFAR	93.067	5NU2GGH001952-04-00		554,497	1,844,678
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		990,929	1,679,594
Technical Assistance to National Health Information Systems and Health Workforce Development of the Federal Democratic Republic of Ethiopia under the President's Emergency Plan for AIDS Relief (PEPFA	93.067	5NU2GGH002090-03-00		330	1,372,510
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	1,362,323
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-18		0	1,349,854
GH13-1368 Global Technical Assistance - CAR COP - NY	93.067	6NU2GGH000994-05-18		0	1,212,525
Technical Assistance to National Health Information Systems and Health Workforce Development of the Federal Democratic Republic of Ethiopia under the President's Emergency Plan for AIDS Relief (PEPFA	93.067	5NU2GGH002090-03-00		42,827	1,152,719
Supporting the Provision of High Quality, Comprehensive, and Sustainable HIV Services in National Teaching and Referral Hospitals in the Republic of Kenya under PEPFAR	93.067	5NU2GGH001952-04-00		443,552	1,064,685
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	959,543
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	912,036
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	878,454
Swaziland - Quality-Assured (NY)	93.067	5NU2GGH001433-05-00		0	852,070
Strengthening Epidemiology and Strategic Information in the Republic of Zimbabwe under the President s Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001939-04-00		0	828,638
HIV-Focused Population Surveys in Countries Supported Under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002173-02-00		0	813,869

For year ended June 30, 2019

					Global Aids
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique under PEPFAR	93.067	5NU2GGH001944-04-00		0	766,498
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		442,573	766,063
Public Health Surveillance of Recent HIV Infection and Response under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH002171-02-00		32,248	761,825
GH13-1368 Global Technical Assistance - CAR COP - NY	93.067	6NU2GGH000994-05-18		0	702,024
GH13-1368 Global Technical Assistance - CAR COP - NY	93.067	6NU2GGH000994-05-18		0	692,540
Strengthening Strategic Information Activities in the Kingdom of Lesotho under PEPFAR (NY)	93.067	6NU2GGH001128-05-06		0	676,436
Strengthening National Epidemiology and Research Capacity to Improve Health Outcomes in the Kingdom of Swaziland under the President's Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	5NU2GGH001271-05-00		0	643,935
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	569,993
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		126,828	546,039
Technical Assistance to Ethiopia's Federal Ministry of Health and Regional Health Bureaus in Comprehensive HIV/AIDS Programming and Direct Site-Level Support in the Four Emerging Regions under PEPFAR	93.067	5NU2GGH002156-02-00		0	539,373
Implementation of Programs for the Prevention, Care and Treatment of HIV/AIDS in the Republic of Cote d Ivoire under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	6NU2GGH002015-02-05		0	527,029
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	501,943
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	456,169
Increase Access to Comprehensive HIV/AIDS Prevention, Care and Treatment Services in the Democratic Republic of Congo under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001351-05-00		0	438,177
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	431,081
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	412,178
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-18		0	393,212
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	340,779
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	332,301
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	307,004
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For year ended June 30, 2019

					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	297,873
Strengthening Epidemiology and Strategic Information in the Republic of Zimbabwe under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001939-04-00		0	248,041
Community-Based HIV Services for Key Populations and Adolescent Girls and Young Women	93.067	5NU2GGH001941-04-00		0	237,333
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	224,327
HIV-Focused Population Surveys in Countries Supported Under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002173-02-00		0	219,147
Supporting the Provision of High Quality, Comprehensive, and Sustainable HIV Services in National Teaching and Referral Hospitals in the Republic of Kenya under PEPFAR	93.067	5NU2GGH001952-04-00		0	215,080
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	208,796
South Sudan Scale-Up (NY)	93.067	5NU2GGH001335-05-00		0	208,054
Lesotho, Provide Miner-friendly SErvices for Integrated TB/HIV Care (PROMISE)	93.067	5U01GH002115-04-00		0	206,697
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	206,216
Swaziland HIV/TB Lab (NY)	93.067	5NU2GGH001307-05-00		0	204,613
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	200,344
Strengthening National Epidemiology and Research Capacity to Improve Health Outcomes in the Kingdom of Swaziland under the President's Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	5NU2GGH001271-05-00		0	191,953
Ethiopia Technical Assistance 1036 (NY)	93.067	6NU2GGH001036-05-05		0	186,086
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	177,475
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	175,340
GH13-1368 Global Technical Assistance - CAR COP - NY	93.067	6NU2GGH000994-05-18		0	175,104
Technical Assistance Program Area #2 1194 (NY)	93.067	6NU2GGH001194-05-06		0	172,925
Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique under PEPFAR	93.067	5NU2GGH001944-04-00		0	172,431
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	155,849

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					Global Aids
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	155,719
Supporting Sustainable Surveillance Systems Among Key Populations (KP) and Support the Government of Zambia to Improve HIV-related Services for KP under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002056-03-00		0	153,363
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	147,211
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	145,911
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	145,395
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	136,848
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	131,439
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	129,801
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	126,489
Lesotho, Provide Miner-friendly SErvices for Integrated TB/HIV Care (PROMISE)	93.067	5U01GH002115-04-00		7,934	125,844
HIV-Focused Population Surveys in Countries Supported Under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002173-02-00		0	117,239
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	114,814
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	113,376
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	112,429
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	109,909
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	109,532
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	107,455
ĜH13-1368 Ĝlobal Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	105,080
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	104,742
Supporting Sustainable Surveillance Systems Among Key Populations (KP) and Support the Government of Zambia to Improve HIV-related Services for KP under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002056-03-00		0	103,492

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					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	102,030
Increase Access to Comprehensive HIV/AIDS Prevention, Care and Treatment Services in the Democratic Republic of Congo under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001351-05-00		0	101,556
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	100,499
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	99,905
Public Health Surveillance of Recent HIV Infection and Response under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH002171-02-00		0	99,047
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	98,609
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	97,750
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	96,698
Technical Assistance Program Area #2 1194 (NY)	93.067	6NU2GGH001194-05-06		0	89,940
Strengthening Epidemiology and Strategic Information in the Republic of Zimbabwe under the President s Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001939-04-00		0	89,391
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	89,261
HIV-Focused Population Surveys in Countries Supported Under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002173-02-00		0	84,133
Technical Assistance to National Health Information Systems and Health Workforce Development of the Federal Democratic Republic of Ethiopia under the President's Emergency Plan for AIDS Relief (PEPFA	93.067	5NU2GGH002090-03-00		0	82,078
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	81,496
Community-Based HIV Services for Key Populations and Adolescent Girls and Young Women	93.067	5NU2GGH001941-04-00		0	79,529
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	78,480
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	78,290
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	75,659
HIV-Focused Population Surveys in Countries Supported Under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002173-02-00		0	74,079
Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique under PEPFAR	93.067	5NU2GGH001944-04-00		0	73,840

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					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	67,810
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	67,643
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	67,581
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	62,732
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	61,131
Supporting the Provision of High Quality, Comprehensive, and Sustainable HIV Services in National Teaching and Referral Hospitals in the Republic of Kenya under PEPFAR	93.067	5NU2GGH001952-04-00		0	60,476
Lesotho, Provide Miner-friendly SErvices for Integrated TB/HIV Care (PROMISE)	93.067	5U01GH002115-04-00		17,181	60,229
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	57,975
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	57,720
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	57,551
Lesotho, Provide Miner-friendly SErvices for Integrated TB/HIV Care (PROMISE)	93.067	5U01GH002115-04-00		0	56,433
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	56,210
Technical Assistance Program Area #2 1194 (NY)	93.067	6NU2GGH001194-05-06		0	53,754
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	51,915
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	51,910
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	50,442
Technical Assistance to National Health Information Systems and Health Workforce Development of the Federal Democratic Republic of Ethiopia under the President's Emergency Plan for AIDS Relief (PEPFA	93.067	5NU2GGH002090-03-00		0	49,906
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	47,763
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	46,803
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	46,264

For year ended June 30, 2019

					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	45,374
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	43,582
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	43,475
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	43,179
Strengthening Epidemiology and Strategic Information in the Republic of Zimbabwe under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001939-04-00		0	42,668
Strengthening National Epidemiology and Research Capacity to Improve Health Outcomes in the Kingdom of Swaziland under the President's Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	5NU2GGH001271-05-00		0	41,863
GH13-1368 HQ Global Technical Assistance	93.067	6NU2GGH000994-05-11		0	41,521
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	36,734
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	35,418
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		34,394	34,394
Supporting Sustainable Surveillance Systems Among Key Populations (KP) and Support the Government of Zambia to Improve HIV-related Services for KP under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002056-03-00		0	34,394
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	33,025
HIV-Focused Population Surveys in Countries Supported Under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002173-02-00		0	31,218
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	30,780
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	30,071
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	28,980
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	27,907
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	27,245
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	25,064
Strengthening Strategic Information Activities in the Kingdom of Lesotho under PEPFAR (NY)	93.067	6NU2GGH001128-05-06		0	22,928

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					Global Aids
Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	22,811
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		22,811	22,811
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	21,257
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		21,257	21,257
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	20,544
HIV-Focused Population Surveys in Countries Supported Under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002173-02-00		0	17,850
Public Health Surveillance of Recent HIV Infection and Response under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH002171-02-00		0	17,133
Supporting Sustainable Surveillance Systems Among Key Populations (KP) and Support the Government of Zambia to Improve HIV-related Services for KP under the President's Emergency Plan for AIDS Relief	93.067	5NU2GGH002056-03-00		0	16,991
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	14,447
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	13,944
Technical Assistance Program Area #2 1194 (NY)	93.067	6NU2GGH001194-05-06		0	13,564
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	13,029
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	12,436
Strengthening Epidemiology and Strategic Information in the Republic of Zimbabwe under the President s Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH001939-04-00		0	11,860
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	11,793
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	9,777
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	8,372
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	8,160
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	8,096
Technical Assistance Program Area #2 1194 (NY)	93.067	6NU2GGH001194-05-06		0	7,876

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					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	7,726
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	6,510
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	5,892
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	5,872
Swaziland - Quality-Assured (NY)	93.067	5NU2GGH001433-05-00		0	5,394
Public Health Surveillance of Recent HIV Infection and Response under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH002171-02-00		0	5,127
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	4,423
Public Health Surveillance of Recent HIV Infection and Response under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH002171-02-00		0	4,158
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	3,791
Technical Assistance Program Area #2 1194 (NY)	93.067	6NU2GGH001194-05-06		0	3,651
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	2,403
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	2,307
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	1,565
Public Health Surveillance of Recent HIV Infection and Response under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH002171-02-00		0	1,127
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	1,033
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	120
Public Health Surveillance of Recent HIV Infection and Response under the President's Emergency Plan for AIDS Relief (PEPFAR)	93.067	5NU2GGH002171-02-00		0	110
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	32
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-29
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-38

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					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-53
Strengthening Strategic Information Activities in the Kingdom of Lesotho under PEPFAR (NY)	93.067	6NU2GGH001128-05-06		0	-67
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-84
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-139
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-206
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-296
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-424
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-574
Technical Assistance Program Area #2 1194 (NY)	93.067	6NU2GGH001194-05-06		0	-614
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-846
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-881
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		-881	-881
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-1,419
MŽ Technical Assistance 0424 (NY)	93.067	6NU2GGH000424-05-06		0	-1,558
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-1,821
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-1,884
Building Mozambican Capacity - NY	93.067	5U2GPS002756-05		0	-2,634
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-2,713
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-3,117
Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique under PEPFAR	of 93.067	5NU2GGH001944-04-00		0	-3,572

Federal Grantor / Pass-through Grantor	CFDA	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Global Aids  Total Expenditures
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	(Includes Subrecipients) -4,140
GH13-1368 Global Technical Assistance - NY	93.067	6NU2GGH000994-05-18		0	-4,757
South Sudan Scale-Up (NY)	93.067	5NU2GGH001335-05-00		0	-4,980
Supporting Sustainable Implementation of HIV and TB Services for Epidemic Control in the Republic of Mozambique under PEPFAR	93.067	5NU2GGH001944-04-00		0	-5,199
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-9,426
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-13,730
Strengthening National Epidemiology and Research Capacity to Improve Health Outcomes in the Kingdom of Swaziland under the President's Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	5NU2GGH001271-05-00		0	-15,043
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		-20,760	-20,760
Śwaziland HIV/TB Lab (NY)	93.067	5NU2GGH001307-05-00		0	-20,760
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-31,935
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-34,847
Ethiopia Technical Assistance 1036 (NY)	93.067	6NU2GGH001036-05-05		0	-36,215
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		-36,215	-36,215
Strengthening National Epidemiology and Research Capacity to Improve Health Outcomes in the Kingdom of Swaziland under the President's Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	5NU2GGH001271-05-00		0	-135,738
Population-based Impact Assessments in Resource-Constrained Settings under the Presidents Emergency Plan for AIDS Relief (PEPFAR) - NY	93.067	6NU2GGH001226-05-04		0	-675,154
				\$12,831,803	\$169,549,083
Total Direct Award Programs				\$12,831,803	\$169,549,083
Pass-through Awards					
Global AIDS					
Transition of Angola INLS Aggregate Database to DHIS2	93.067	INLS CU 18-2450	6NU2GGH001918-02	0	47,166

					Global Aids
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Total Expenditures (Includes Subrecipients)
Delivering Comprehensive Services to Achieve HIV Epidemic Control in Subnational Units in Nigeria under PEPFAR	93.067	CHIP CU18-3934	U2GGH002097-01	0	39,826
Transition of Angola INLS Aggregate Database to DHIS2	93.067	INLS CU 18-2450	6NU2GGH001918-02	0	26,565
				\$0	\$113,557
Total Pass-through Programs				\$0	\$113,557
Total: <b>Department of Health &amp; Human Services</b> (Excluding NIH)				\$12,831,803	\$169,662,640
Total: Global Aids				\$12,831,803	\$169,662,640

					TRIO Cluster
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
TRIO Cluster					
Department of Education					
Direct Awards					
TRIO Talent Search					
CCO DDC Talent Search	84.044	DE-P044A160893		0	384,824
				\$0	\$384,824
TRIO Upward Bound					
TRIO Upward Bound Program	84.047	P047A170670-19		0	878,867
				\$0	\$878,867
Total Direct Award Programs				\$0	\$1,263,691
Total: Department of Education				\$0	\$1,263,691
Total: TRIO Cluster			-	\$0	\$1,263,691

					Other Programs
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Other Programs					
Department of Health & Human Services					
Direct Awards					
Centers for Disease Control and Prevention/DHHS					
TB Building and Strengthening Infection Control Strategies	93	CDC#14IPA1417004		0	179,258
TB Building and Strengthening Infection Control Strategies	93	CDC#14IPA1417004		0	156,228
				\$0	\$335,486
Food and Drug Administration Research					
2018 OHDSI Symposium	93.103	1R13FD006470-01		0	85,000
				\$0	\$85,000
Emergency Medical Services for Children					
EMSC NETWORK DEVELOPMENT DEMONSTRATION PROJECT (NDDP)	93.127	6U03MC00007 -18- 02		205,926	449,644
ÉMSC NETWORK DEVELOPMENT DEMONSTRATION PROJECT (NDDP)	93.127	6U03MC00007 -18- 02		179,413	226,306
				\$385,339	\$675,950
HIV-Related Training and Technical Assistance					
AIDS Education and Training Centers Program	93.145	5U10HA29291-04-00		1,257,503	3,096,249
AIDS Education and Training Centers Program	93.145	5U10HA29291-04-00		1,006,825	1,169,087
				\$2,264,328	\$4,265,336
Substance Abuse and Mental Health Services Projects of Regional ar	nd National Significa	ance			
Training Medical and Dental Students in SBIRT	93.243	6H79TI025937-03M003		73,110	84,810
				\$73,110	\$84,810

# The Trustees of Columbia University in the City of New York Schedule of Expenditures of Federal Awards For year ended June 30, 2019

					Other Programs
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	<u>Project No</u>	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Health Systems Strengthening and HIV/AIDS Prevention, Care and	Treatment under the F	President's Emergency	Plan for AIDS Relief		
Resilient and Responsive Health Systems Initiative	93.266	6UH6HA30739-03-02		182,296	2,091,926
Resilient and Responsive Health Systems Initiative (RRHS)	93.266	6UH6HA30740-03-05		121,879	930,450
Resilient and Responsive Health Systems Initiative	93.266	6UH6HA30739-03-02		0	589,580
Resilient and Responsive Health Systems Initiative (RRHS)	93.266	6UH6HA30740-03-05		0	497,953
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	344,143
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	267,669
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	197,695
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	197,323
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	137,621
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		10,688	131,566
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	121,153
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	118,223
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		25,709	112,423
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	102,519
Resilient and Responsive Health Systems Initiative	93.266	6UH6HA30739-03-02		0	93,293
Resilient and Responsive Health Systems Initiative (RRHS)	93.266	6UH6HA30740-03-05		0	85,263
Resilient and Responsive Health Systems Initiative (RRHS)	93.266	6UH6HA30740-03-05		0	82,001
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	76,689

For year ended June 30, 2019

					Other Programs
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	<u>Total Expenditures</u> (Includes Subrecipients)
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	74,735
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	67,328
Resilient and Responsive Health Systems Initiative	93.266	6UH6HA30739-03-02		0	67,219
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		31,251	66,204
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	66,143
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	59,071
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	58,710
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	57,592
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	53,477
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	44,310
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	41,860
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	41,501
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	40,930
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		21,535	38,010
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	37,156
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	35,703
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	32,275
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	29,270
Optimizing Momentum - Toward Sustainable Epidemic Control	93.266	6UJ7HA31180-02-04		0	29,002
Quality Improvement Capacity for Impact Project - Ken COP16 - NY	93.266	5U1NHA28555-05-00		0	24,584

<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures
93.266	6UJ7HA31180-02-04		8,681	(Includes Subrecipients) 23,30
93.266	6UJ7HA31180-02-04		0	13,21:
93.266	6UJ7HA31180-02-04		0	11,53
93.266	6UJ7HA31180-02-04		0	10,64
93.266	5U1NHA28555-05-00		0	10,24
93.266	5U1NHA28555-05-00		0	9,55
93.266	5U1NHA28555-05-00		0	8,50
93.266	5U1NHA28555-05-00		0	36
93.266	6U92HA127772-08-26		0	-41
93.266	6U92HA127772-08-20		0	-53
93.266	5U1NHA28555-05-00		0	-5,24
93.266	6U92HA127772-08-20		0	-5,390
93.266	6U92HA127772-08-20		0	-5,970
93.266	5U1NHA28555-05-00		0	-20,51
93.266	6U92HA127772-08-26		0	-30,50
93.266	6U92HA127772-08-20		0	-107,22
			\$402,039	\$7,054,123
n Activities				
93.269	5U01GH001644-05-00		0	64,03
93.269	5U01GH001644-05-00		0	56,50
	93.266  93.266  93.266  93.266  93.266  93.266  93.266  93.266  93.266  93.266  93.266  93.266  93.266  93.266	93.266 6UJ7HA31180-02-04  93.266 6UJ7HA31180-02-04  93.266 6UJ7HA31180-02-04  93.266 5U1NHA28555-05-00  93.266 5U1NHA28555-05-00  93.266 5U1NHA28555-05-00  93.266 6U92HA127772-08-26  93.266 6U92HA127772-08-20   93.266 6UJ7HA31180-02-04  93.266 6UJ7HA31180-02-04  93.266 5UJNHA28555-05-00  93.266 5UJNHA28555-05-00  93.266 5UJNHA28555-05-00  93.266 5UJNHA28555-05-00  93.266 6U92HA127772-08-26  93.266 6U92HA127772-08-20   93.266 6UJ7HA31180-02-04 0 93.266 6UJ7HA31180-02-04 0 93.266 5UJNHA28555-05-00 0 93.266 6U92HA127772-08-26 0 93.266 6U92HA127772-08-20 0		

					Other Programs
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
				\$0	\$120,542
rotecting and Improving Health Globally: Building and Strengt	thening Public Health Imp	act, Systems, Capacity	and Security		
Ebola Emergency Response in Sierra Leone	93.318	6NU19GH001581-03-06		0	1,625,374
Ébola Émergency Response in Sierra Leone	93.318	6NU19GH001581-03-06		0	459,025
Ébola Émergency Response in Sierra Leone	93.318	6NU19GH001581-03-06		0	227,475
Ébola Emergency Response in Sierra Leone	93.318	6NU19GH001581-03-06		0	81,492
Ébola Émergency Response in Sierra Leone	93.318	6NU19GH001581-03-06		0	67,473
Ébola Emergency Response in Sierra Leone	93.318	6NU19GH001581-03-06		0	49,137
				\$0	\$2,509,976
ublic Health Training Centers Program					
Affordable Care Act (ACA) Public Health Training Centers	93.516	4UB6HP27878-04-06		86,023	166,087
Áffordable Care Act (ÁCA) Public Health Training Centers	93.516	4UB6HP27878-04-06		0	30,948
		•••••		\$86,023	\$197,035
Early Head Start	00.000	000110040 00 04		2	4 004 407
Éarly Head Start	93.600	02CH3042-06-01		0	1,904,127
Early Read Start	93.600	02CH3042-06-01		0	456,770
Early Head Start	93.600	02CH3042-06-01		0	351,254
Early Head Start	93.600	02CH3042-06-01		0	87,763
Head Start	93.600	02CH3022-06-02		0	2,044
Head Start	93.600	02CH3022-06-02		0	631

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Other Programs  Total Expenditures (Includes Subrecipients)
Head Start	93.600	02CH3022-06-02		0	(moidaes oubreoipiems)
Head Start	93.600	02CH3022-06-02		0	-
Éarly Head Start	93.600	02CH3042-06-01		0	-4,41
				\$0	\$2,798,17
Grants for Primary Care Training and Enhancement					
Primary Care Training and Enhancement	93.884	5T0BHP29302 -05- 00		0	257,65
Primary Care Training and Enhancement	93.884	5T0BHP29302 -05- 00		0	98
				\$0	\$258,64
Ryan White HIV/AIDS Dental Reimbursement and Community Based	Dental Partnership	Grants			
Dental Care for Hard-to-Reach HIV/AIDS Populations in Harlem & South Bronx	93.924	6H65HA00014-16-02		44,644	44,76
Dental Care for Hard-to-Reach HIV/AIDS Populations in Harlem & South Bronx	93.924	6H65HA00014-16-02		0	-15
				\$44,644	\$44,61
HIV Demonstration, Research, Public and Professional Education Pro	ojects				
PRESIDENTIAL EXPANSION PROJECT FOR AIDS RELIEF - RWANDA OFF	93.941	5 U62 PS223540-08		0	-15,82
				\$0	\$-15,823
Total Direct Award Programs				\$3,255,483	\$18,413,872
Pass-through Awards					
Centers for Disease Control and Prevention/DHHS					
Human Resources for Health, Rwanda	93	MHRW CU14-1787	CDC CU14-1787	0	-6,50
Office of Research Integrity/DHHS					
Project for Scholarly Integrity in Graduate Education	93	CGS PO #100	ORI CU09-0904	0	8,82

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Other Programs  Total Expenditures
	<u>5. 5</u>	<u></u>	- add through dominatively	<u> </u>	(Includes Subrecipients) \$2,322
				ΨΟ	Ψ2,022
HIV-Related Training and Technical Assistance					
AETC National Coordinating Resource Center	93.145	RUTGER 0681	5U1OH28686-04-00	0	19,471
				\$0	\$19,471
Health Careers Opportunity Program					
Health Careers Opportunity Program	93.822	ISMMS 0253-6641-4609	1D18HP29036-01-00	0	73,134
Health Careers Opportunity Program	93.822	ISMMS 0253-6641-4609	1D18HP29036-01-00	0	33,109
				\$0	\$106,243
HIV Prevention Activities Non-Governmental Organization Based					
Comprehensive High-Impact HIV Prevention Projects for Community- Based Organizations	93.939	ASCNYC CU161123	U65PS004743	0	96,867
Comprehensive High-Impact HIV Prevention Projects for Community- Based Organizations	93.939	ASCNYC CU161123	U65PS004743	0	87,553
				\$0	\$184,420
Total Pass-through Programs				\$0	\$312,456
Total: Department of Health & Human Services (Excluding NIH)	)			\$3,255,483	\$18,726,328
State / City Government					
Pass-through Awards					
Maternal and Child Health Services Block Grant to the States					
(Rape Crisis) Enough is Enough	93.994	DOH01-C33377GG-3450000	HRSA CU18-3003	0	40,138
NYSDOH Preventive Dental Services Program	93.994	SDH C027547	HRSA	0	-10
NÝSDOH Preventive Dental Services Program	93.994	SDH C027547	HRSA	0	-19

93.994 93.994	Project No SDH C027547 SDH C027547	Pass-through Contract Number  HRSA  HRSA	Subrecipients 0	Total Expenditures (Includes Subrecipients) -1,348
93.994	SDH C027547	HRSA		
			0	-8,459
			\$0	\$30,071
			\$0	\$30,071
			\$0	\$30,071
43.001	80NSSC18K1592		0	21,899
43.001	80NSSC18K1592		0	4,340
43.001	NNX15AP01H		0	2,645
			\$0	\$28,884
43.012	NNX16AM79H		0	9,649
			\$0	\$9,649
			\$0	\$38,533
			<u>\$0</u>	\$38,533
12.300	N00014-19-1-2002		0	36,404
_	43.001 43.001 43.012	43.001 80NSSC18K1592  43.001 NNX15AP01H  43.012 NNX16AM79H	43.001 80NSSC18K1592  43.001 NNX15AP01H  43.012 NNX16AM79H	43.001 80NSSC18K1592 0  43.001 NNX15AP01H 0  \$0  43.012 NNX16AM79H 0  \$0  \$0  \$0  \$0  \$0  \$0  \$0

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Other Programs  Total Expenditures
VIII World On server On what fine I Machania 7/00/40 7/07/40	<u> CI DA</u>	<u>i Toject No</u>	ass-tillough Contract Number	Subrecipients	(Includes Subrecipients)
XIII World Congress Computational Mechanics 7/22/18 - 7/27/18	12.300	N00014-18-1-2607		0	5,000
Hacking for Defense at Columbia University	12.300	N00014-19-1-2002		0	2,430
				\$0	\$43,834
Air Force Defense Research Sciences Program					
XIII World Congress Computational Mechanics 7/22/18 - 7/27/18	12.800	FA9550-18-1-0482		0	10,000
				\$0	\$10,000
Total Direct Award Programs				\$0	\$53,834
Total: Department of Defense				<u>\$0</u>	\$53,834
Department of Commerce					
Direct Awards					
Science, Technology, Business and/or Education Outreach					
XIII World Congress Computational Mechanics	11.620	60NANB17D314		0	15,000
				\$0	\$15,000
Total Direct Award Programs				<b>\$0</b>	\$15,000
				\$0 \$0	\$15,000 \$15,000
Total: Department of Commerce					
Total: Department of Commerce Department of Education					
Total: Department of Commerce  Department of Education  Direct Awards  National Resource Centers Program for Foreign Language and Area Studio	es or Foreign L	.anguage and Internatio	onal Studies Program and Foreign		
Total Direct Award Programs  Total: Department of Commerce  Department of Education  Direct Awards  National Resource Centers Program for Foreign Language and Area Studie  Language and Area Studies Fellowship Program  FLAS: Middle East Institute, Columbia University, Title VI Proposal	es or Foreign L 84.015	anguage and Internation	onal Studies Program and Foreign		
Total: Department of Commerce  Department of Education  Direct Awards  National Resource Centers Program for Foreign Language and Area Studio Language and Area Studies Fellowship Program			onal Studies Program and Foreign	\$0	\$15,000

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Other Programs  Total Expenditures
Middle East Institute, Columbia University, Title VI Proposal	84.015	P015A180080 - 19		0	(Includes Subrecipients) 212,861
Title VI National Resource Center: Columbia Weatherhead East Asian Institute					212,001
Tue VI National Resource Center: Columbia Weatherhead East Asian Institute	84.015	P015A180086 - 19		0	53,026
Title VI National Resource Center: Columbia Weatherhead East Asian Institute	84.015	P015A180086 - 19		0	43,901
Title VI National Resource Center: Columbia Weatherhead East Asian Institute	84.015	P015A180086 - 19		0	31,207
Title VI National Resource Center: Columbia Weatherhead East Asian Institute	84.015	P015A180086 - 19		0	18,402
Middle East Institute, Columbia University, Title VI Proposal	84.015	P015A180080 - 19		0	10,043
Middle East Institute, Columbia University, Title VI Proposal	84.015	P015A180080 - 19		0	7,407
Title VI National Resource Center: Columbia Weatherhead East Asian Institute	84.015	P015A180086 - 19		0	1,080
				\$0	\$1,211,192
Total Direct Award Programs				\$0	\$1,211,192
Total: Department of Education				<u>\$0</u>	\$1,211,192
Department of Homeland Security					
Direct Awards					
State and Local Homeland Security National Training Program					
Enhancing Financial Literacy of Individuals and Businesses for Post-Disaster Recovery	97.005	EMW-2018-CA-00069-S01		0	197,571
Training Solutions: Transitioning Disaster Survivors from Temporary to Permanent Housing	97.005	EMW-2018-CA-00068-S01		0	180,628
				\$0	\$378,199
Total Direct Award Programs				\$0	\$378,199
Total: Department of Homeland Security				\$0	\$378,199

**Department of State** 

**Direct Awards** 

For year ended June 30, 2019

					Other Programs
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	Total Expenditures (Includes Subrecipients)
Professional and Cultural Exchange Programs - Special Professional and Co	ultural Progra	ams			
The Ngwang Choephel Fellows Program	19.012	S-ECAGD-17-GR-1095		0	89,892
The Ngwang Choephel Fellows Program: Tibet Small Business Training and Outreach Project, FY 2016	19.012	S-ECAGD-16-GR-1128		0	24,960
FY-18 - Ngwang Choephel Fellowship Program: Tibet	19.012	S-ECAGD-18-GR-0004		0	12,209
The Ngwang Choephel Fellows Program: Tibet Small Business Training and Outreach Project, FY 2016	19.012	S-ECAGD-16-GR-1128		0	3,133
FY-18 - Ngwang Choephel Fellowship Program: Tibet	19.012	S-ECAGD-18-GR-0004		0	2,250
The Ngwang Choephel Fellows Program	19.012	S-ECAGD-17-GR-1095		0	1,460
				\$0	\$133,904
nvesting in People in The Middle East and North Africa					
Fostering Entrepreneurship in Tunisian Higher Education	19.021	DS STS80018GR0029		0	27,267
Fostering Entreprenuership in Tunisia	19.021	DS STS80017GR0087		0	26,678
Fostering Entrepreneurship in Tunisian Higher Education	19.021	DS STS80018GR0029		0	25,899
Fostering Entrepreneurship in Tunisian Higher Education	19.021	DS STS80018GR0029		0	15,120
Fostering Entreprenuership in Tunisia	19.021	DS STS80017GR0087		0	12,299
Fostering Entreprenuership in Tunisia	19.021	DS STS80017GR0087		0	6,917
				\$0	\$114,180
Total Direct Award Programs				\$0	\$248,084
Total: Department of State				\$0	\$248,084

**Department of Veterans Affairs** 

**Direct Awards** 

**Department of Veterans Affairs** 

For year ended June 30, 2019

Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	Subrecipients	Other Programs  Total Expenditures
VISN 3 MIRECC				<u></u>	(Includes Subrecipients
VION 3 WINCEGO	64	DVAMC CU16-2032		0	38,77
VISN 5 MIRECC	64	VA245-17-C-0029		0	6,28
VISN 3 MIRECC	64	DVAMC CU16-2032		0	3,52
VISN 5 MIRECC	64	VA245-17-C-0029		0	2,00
AMES J PETERS VA MEDICAL CENTER					
DNA Methylation and inflammatory signatures associated with suicide	64	JJPVA CU17-1648		0	16,51
RCT of Group (	64	JJPVA CU18-3740		0	7,69
				\$0	\$74,79
otal Direct Award Programs				<b>\$0</b>	\$74,79
Total: Department of Veterans Affairs				\$0	\$74,79
Nat. Endowment for the ArtsHumanities					
Direct Awards					
Promotion of the Arts Grants to Organizations and Individuals					
2019 Conversations Concerts (Composer Portraits and Pop-Up Concerts)	45.024	NEA 1847140-31-19		0	30,00
				U	30,00
To support an artist residency program to improve the mental health of patients, mental health professionals, and the general public.	45.024	NEA 1830735-54-18		0	
	45.024	NEA 1830735-54-18			29,61
professionals, and the general public.				0	29,61
professionals, and the general public.				0	\$59,610 \$18,10
professionals, and the general public.  Promotion of the Humanities Teaching and Learning Resources and Curric	culum Develop	ment		\$0	\$59,610
professionals, and the general public.  Promotion of the Humanities Teaching and Learning Resources and Curric	culum Develop	ment		\$0	\$59,610 \$18,10

United States Agency for International Dvlpt.

For year ended June 30, 2019

					Other Programs
Federal Grantor / Pass-through Grantor	<u>CFDA</u>	Project No	Pass-through Contract Number	<u>Subrecipients</u>	<u>Total Expenditures</u> (Includes Subrecipients)
Direct Awards					1
USAID Foreign Assistance for Programs Overseas					
Malaria Diagnosis and Treatment Activity	98.001	72066318CA00005		138,719	3,085,403
Malaria Diagnosis and Treatment Activity	98.001	72066318CA00005		0	408,836
USAID/MSPH/ISCISA Management Education Partnership	98.001	AID-656-A17-00006		0	219,096
USAID/MSPH/ISCISA Management Education Partnership	98.001	AID-656-A17-00006		0	28,945
				\$138,719	\$3,742,280
Total Direct Award Programs				\$138,719	\$3,742,280
Pass-through Awards					
USAID Foreign Assistance for Programs Overseas					
A Global Scoping and Documenting of Effective Practices to Address Menstrual Hygiene Laundry, Disposal and Waste Management among Displaced Populations	98.001	IRC CU 18-3862	720FDA18GR00049	0	156,444
Technical Support to PEPFAR Programs in the Southern Africa Regin	98.001	TSP00ICAP16	AID-674-A-16-00003	0	10,318
Meeting Targets and Maintaining Epidemic Control	98.001	JHPIEGO 19-SBA-149	7200AA19CA00003	0	9,303
ÚŚAID/KENYA APHIAplus, Health Service Delivery Projects (NY)	98.001	JHPIEGO 11-SBA-014	AID CU10-2068	0	-7,342
				\$0	\$168,723
Total Pass-through Programs				\$0	\$168,723
Total: United States Agency for International Dvlpt.				\$138,719	\$3,911,003
Total: Other Programs				\$3,394,202	\$24,764,759
Total Federal Award Expenditures:				\$120,409,103	\$1,314,146,429

#### The Trustees of Columbia University in the City of New York

Notes to Summary Schedule of Expenditures of Federal Awards Year ended June 30, 2019

#### 1. Basis of Presentation

The accompanying Schedule of Expenditures of Federal Awards (the "Schedule") has been prepared in accordance with OMB Uniform Guidance. The purpose of the Schedule is to present a summary of those activities of The Trustees of Columbia University in the City of New York (the "University") for the year ended June 30, 2019, which have been financed by the U.S. Government ("Federal awards"). For purposes of the Schedule, Federal awards include all Federal assistance entered into directly between the University and the Federal government and also between the University and other primary recipients of Federal government funds (pass-through), recorded on the accrual basis of accounting. Negative amounts listed on the Schedule represent adjustments, in the normal course of business, to amounts included on the prior year's Schedule. In addition, amounts indicated in the schedule with zero expenditures, are reflective of actual expenditures transacted at less than \$1, which are rounded down in the context of the report. The project number on the Schedule represents the number assigned by the direct or originating sponsor, and when not available an alpha-numeric number is assigned by the University to manage sponsored project spending. The pass-through contract number on the Schedule represents the number assigned by the pass-through entity to the applicable program. CFDA numbers and pass-through numbers are provided when available.

### 2. Facility and Administrative Costs

The University elects not to use the 10% de minimis rate allowed under the Uniform Guidance. The University and the federal government operated under a provisional agreement that provided for facilities and administrative ("F&A") cost rates under federal grants and contracts through October 24, 2017. The provisional rates were based on the agreement that was in place through June 30, 2014. In the fall 2017, the University entered into a new agreement with the federal government which defines the rate at which the University can be reimbursed for F&A costs applicable to federal on-campus research effective July 1, 2018. This agreement will remain in place until such time a new agreement is reached. The following are the University F&A cost rates that were established as provisional rates:

All campuses, excluding Lamont-Doherty Earth Observatory	
On-campus	62.0 %
Off-campus	26.0
Off-campus modified	29.4
Lamont-Doherty Earth Observatory	
On-campus	54.0 %
Off-campus	26.0
Off-campus modified	29.4
Other sponsored activity	
On-campus	31.0 %
Off-campus	26.0

#### 3. Guaranteed Student Loan Programs

With respect to the Federal Direct Lending Program, the University is only responsible for the performance of certain administrative duties; therefore, the transactions and the balances of loans outstanding related to this program are not included in the University's consolidated financial statements. The schedule includes the amounts awarded to students during the year ended June 30, 2019. It is not practical to estimate the outstanding balance of loans under this program.

### The Trustees of Columbia University in the City of New York

Notes to Summary Schedule of Expenditures of Federal Awards Year ended June 30, 2019

#### 4. Student Loan Programs

The University is responsible for the oversight and management of the U.S. Department of Education's Federal Title IV Programs, which includes Federal Perkins Loan Program (CFDA # 84.038), as well as Health Resources and Services Administration (HRSA) Title VII and Title VIII loan programs funded by the Department of Health and Human Services. (amounts in thousands)

Federal Agency	Loan Program	Federal CFDA No.	Outstanding Principal Balance at June 30 ,2019		
Education	Perkins Loan	84.038	\$	41,390	
DHHS	Health Professionals	93.342		7,997	
DHHS	Nursing Students	93.364		780	
			\$	50,167	

The federally approved administrative cost allowed under the Title IV program for Federal Work study, Federal Perkins and Federal SEOG for the fiscal year ending June 30, 2019 was \$379 thousand. This expense was charged to the Federal Work Study Program. The administrative cost allowance is determined as a percentage of the total program expenditures. The formula permits administrative cost charges at 4.5% of the first \$5.5 million expended and 3% on expenditures over \$5.5 million.



# Report of Independent Auditors on Internal Control over Financial Reporting and on Compliance and Other Matters Based on an Audit of Financial Statements Performed in Accordance With Government Auditing Standards

To The Trustees of Columbia University in the City of New York

We have audited, in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issued by the Comptroller General of the United States, the consolidated financial statements of The Trustees of Columbia University in the City of New York and its subsidiaries (the "University"), which comprise the consolidated balance sheet as of June 30, 2019, and the related consolidated statements of activities and of cash flows for the year then ended, and the related notes to the financial statements, and have issued our report thereon dated October 8, 2019, which includes an emphasis of matter paragraph regarding the University's change in the manner in which it presents net assets and reports certain aspects of its financial statements as a not-for-profit entity in 2019 and the manner in which it accounts for net periodic benefit cost in 2019.

#### Internal Control Over Financial Reporting

In planning and performing our audit of the financial statements, we considered the University's internal control over financial reporting ("internal control") to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinion on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the University's internal control.

Accordingly, we do not express an opinion on the effectiveness of the University's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or a combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies. Given these limitations, during our audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.



#### **Compliance and Other Matters**

As part of obtaining reasonable assurance about whether the University's financial statements are free from material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit and, accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance or other matters that are required to be reported under *Government Auditing Standards*.

#### Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.

New York, New York

Pricewoterhouse Coopers LLP

October 8, 2019



# Report of Independent Auditors on Compliance with Requirements That Could Have a Direct and Material Effect on Each Major Program and on Internal Control Over Compliance in Accordance with the Uniform Guidance

To The Trustees of Columbia University in the City of New York

#### Report on Compliance for Each Major Federal Program

We have audited The Trustees of Columbia University in the City of New York and its subsidiaries' (the "University") compliance with the types of compliance requirements described in the *OMB Compliance Supplement* that could have a direct and material effect on each of the University's major federal programs for the year ended June 30, 2019. The University's major federal programs are identified in the summary of auditor's results section of the accompanying schedule of findings and questioned costs.

#### Management's Responsibility

Management is responsible for compliance with federal statutes, regulations and the terms and conditions of its federal awards applicable to its federal programs.

#### Auditors' Responsibility

Our responsibility is to express an opinion on compliance for each of the University's major federal programs based on our audit of the types of compliance requirements referred to above. We conducted our audit of compliance in accordance with auditing standards generally accepted in the United States of America; the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States; and the audit requirements of Title 2 U.S. *Code of Federal Regulations* Part 200, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards* (Uniform Guidance). Those standards and the Uniform Guidance require that we plan and perform the audit to obtain reasonable assurance about whether noncompliance with the types of compliance requirements referred to above that could have a direct and material effect on a major federal program occurred. An audit includes examining, on a test basis, evidence about the University's compliance with those requirements and performing such other procedures as we considered necessary in the circumstances.

We believe that our audit provides a reasonable basis for our opinion on compliance for each major federal program. However, our audit does not provide a legal determination of the University's compliance.

#### Opinion on Each Major Federal Program

In our opinion, the University complied, in all material respects, with the types of compliance requirements referred to above that could have a direct and material effect on each of its major federal programs for the year ended June 30, 2019.



#### Other Matters

The results of our auditing procedures disclosed instances of noncompliance, which are required to be reported in accordance with the Uniform Guidance and which are described in the accompanying schedule of findings and questioned costs as items 2019-001 and 2019-002. Our opinion on each major federal program is not modified with respect to these matters.

The University's response to the noncompliance findings identified in our audit is described in the accompanying schedule of findings and questioned costs. The University's response was not subjected to the auditing procedures applied in the audit of compliance and, accordingly, we express no opinion on the response.

#### Report on Internal Control Over Compliance

Management of the University is responsible for establishing and maintaining effective internal control over compliance with the types of compliance requirements referred to above. In planning and performing our audit of compliance, we considered the University's internal control over compliance with the types of requirements that could have a direct and material effect on each major federal program to determine the auditing procedures that are appropriate in the circumstances for the purpose of expressing an opinion on compliance for each major federal program and to test and report on internal control over compliance in accordance with the Uniform Guidance, but not for the purpose of expressing an opinion on the effectiveness of internal control over compliance. Accordingly, we do not express an opinion on the effectiveness of the University's internal control over compliance.

A deficiency in internal control over compliance exists when the design or operation of a control over compliance does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct, noncompliance with a type of compliance requirement of a federal program on a timely basis. A material weakness in internal control over compliance is a deficiency, or combination of deficiencies, in internal control over compliance, such that there is a reasonable possibility that material noncompliance with a type of compliance requirement of a federal program will not be prevented, or detected and corrected, on a timely basis. A significant deficiency in internal control over compliance is a deficiency, or a combination of deficiencies, in internal control over compliance with a type of compliance requirement of a federal program that is less severe than a material weakness in internal control over compliance, yet important enough to merit attention by those charged with governance.

Our consideration of internal control over compliance was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control over compliance that might be material weaknesses or significant deficiencies. We did not identify any deficiencies in internal control over compliance that we consider to be material weaknesses. However, material weaknesses may exist that have not been identified.

The purpose of this report on internal control over compliance is solely to describe the scope of our testing of internal control over compliance and the results of that testing based on the requirements of the Uniform Guidance. Accordingly, this report is not suitable for any other purpose.

New York, New York March 18, 2020

Pricewaterhouse Coopers LAP

### The Trustees of Columbia University in the City of New York Summary of Independent Auditors' Results Year Ended June 30, 2019

### Section I – Summary of Independent Auditors' Results

Financial Statements	
Type of report of independent auditors issued:	Unmodified
Internal control over financial reporting: Material weakness (es) identified?	YesX No
Significant deficiencies(s) identified that are not considered to be material weaknesses?	Yes X None reported
Noncompliance material to financial statements noted?	? Yes X No
Federal Awards	
Internal Control over major programs: Material weakness (es) identified?	YesXNo
Significant deficiencies(s) identified that are not consid to be material weaknesses	leredYesX None reported
Type of independent auditors' report issued on complia for major programs:	ance Unmodified
Any audit findings disclosed that are required to be reported in accordance with 2 CFR 200.516(a)?	XYes No
Identification of major programs:	
CFDA Number(s) Various 93.067 93.266  93.145 84.015	Name of Federal Program or Cluster Research & Development Cluster Global AIDS Health Systems Strengthening and HIV/AIDS Prevention, Care and Treatment under the President's Emergency Plan for AIDS Relief HIV-Related Training and Technical Assistance National Resource Centers Program for Foreign Language and Area Studies or Foreign Language and International Studies Program and Foreign Language and Area Studies Fellowship Program
Dollar threshold used to distinguish between Type A and Type B programs:	\$3,942,439
Auditee qualified as low-risk auditee?	X Yes No

# The Trustees of Columbia University in the City of New York Schedule of Findings and Questioned Costs

Year Ended June 30, 2019

#### Section II—Financial Statement Findings

As a result of our audit, no instances of noncompliance related to the financial statements that are required to be reported in accordance with *Government Auditing Standards* were identified.

Section III—Federal Award Findings and Questioned Costs

2019-001: Procurement

Federal Agency: Department of Health and Human Services - National Institutes of Health

**Program: Research and Development** 

CFDA #: 93.310

Award # 10T20D026556

Award Year: 3/24/2018 - 2/28/2023

#### Criteria

In accordance with 2 CFR sections 200.318, 200.319 and 200.320, a non-Federal entity must have history of procurement. These records are to include, but are not necessarily limited to, the following: rationale for the method of procurement, selection of contract type, contractor selection or rejection, and the basis for the contract price. Procurement by small purchase procedures (purchases in excess of \$10,000 but not more than the Simplified Acquisition Threshold) require price or rate quotations from an adequate number of qualified sources.

#### Condition

Of the 25 procurement transactions selected for testing, it was noted that one transaction in the amount of \$14,875 did not include documentation of price quotations from qualified vendors and the basis of the vendor selection.

#### Cause

The University's policy requires purchases of goods and services above \$10,000 but less than the Simplified Acquisition Threshold be supported by documented competitive price quotations. In the instance noted the University policy was not followed with respect to maintaining documentation of price quotations and the basis for selecting the vendor.

#### **Effect**

Documentation evidencing vendor price quotations and selection was not maintained as evidence that general procurement standards and University policy were followed.

#### Recommendation

We recommend the University continue to enforce its procurement policy to ensure that contemporaneous documentation of vendor pricing and selection is maintained, and that the University also continue training and communication of its policies and procedures.

#### **Management's Views and Corrective Action Plan**

Refer to Management's Views and Corrective Action Plan at the end of the report.

### The Trustees of Columbia University in the City of New York **Schedule of Findings and Questioned Costs**

Year Ended June 30, 2019

#### 2019-002: Period of Performance

Federal Agency: Department of Health & Human Services- Centers for Disease Control and

Prevention

**Program: Global Aids** 

CFDA #: 93.067

Award # 6NU2GGH001036-05-05

Award Year: 9/30/2013 - 9/29/2018

#### Criteria

In accordance with 22 CFR section 200.309, a non-Federal entity may charge to the Federal award only allowable costs incurred during the period of performance and any costs incurred before the Federal awarding agency or pass-through entity made the Federal award that were authorized by the Federal awarding agency or pass-through entity.

#### Condition

Of the 11 period of performance transactions selected for testing for this award, it was noted that one transaction in the amount of \$10,075 was outside the award's period of performance. The award's period of performance end date was 9/29/2018, whereas the cost charged to the award related to insurance coverage for federally-sponsored equipment covering the period 10/1/2018-12/31/2018.

#### Cause

The federally-sponsored equipment under the award was to be used for a new continuation project that was awarded in August 2018 with a project start date of 9/30/2018. The insurance coverage for the equipment lapsed on 9/30/2018, but to ensure no lapse in insurance coverage, the insurance premium payment on the renewal policy was required to be made by 9/29/2018 to cover the period 10/1/2018-12/31/2018. The insurance premium cost was charged to the original award which ended on 9/29/2018 and was not subsequently transferred to the new continuation award.

The award includes costs relating to a period outside the award's period of performance that should have been charged to the new continuation award in accordance with federal guidelines and the University's policy.

#### Recommendation

We recommend the University transfer the insurance premium cost from the original award to the continuation award and consider consulting with the grantor on executing the cost transfer. Additionally, the University should continue to enforce its period of performance policy and cost transfer procedures and continue the training and communication of its policies and procedures.

#### Management's Views and Corrective Action Plan

Refer to Management's Views and Corrective Action Plan at the end of the report.

### The Trustees of Columbia University in the City of New York Summary Schedule of Prior Audit Findings Year Ended June 30, 2019

There were no findings from prior years which require an update in this report.

### COLUMBIA UNIVERSITY

#### IN THE CITY OF NEW YORK

#### ANNE SULLIVAN

EXECUTIVE VICE PRESIDENT FOR FINANCE AND INFORMATION TECHNOLOGY

Management's Response and Corrective Action Plan Regarding the Uniform Guidance Audit Findings for the Year Ended June 30, 2019

#### 2019-001

Management acknowledges that contemporaneous documentation was not retained in this instance. The department initiating the transaction sought guidance from another department on appropriate vendors and pricing. This second department, having engaged vendors for similar advertising services, recommended the selected vendor. The recommendation was based on pricing research routinely performed and their experience with the vendor. However, the University's policy requires a more robust analysis as well as documentation, which the department incurring this expense did not develop. The audit finding presents an opportunity to enhance guidance and training and to expand our central review of documentation utilizing our existing purchase order process. Management will affect the change expanding purchases requiring purchase orders, and therefore a central review, and communicate with the University community by May 1, 2020. Central Procurement will enhance monitoring of compliance with the expanded purchase order policy upon effect.

#### 2019-002

Management acknowledges that the insurance premium cost was charged to a terminating award and was not subsequently transferred to the new continuation award by the financial staff in our Ethiopia office of ICAP, a center within the University's Mailman School of Public Health. Management agrees with the auditor's recommendation to continue training and enforce the period of performance requirements. While the insurance charge is allocable to the continuation award, due to the time that has elapsed, it has been transferred to non-federal sources in accordance with our cost transfer policy requirement.

The award under which the equipment was purchased ended on September 29, 2018, which is when the insurance coverage ceased. The new award was a continuation which would utilize the same insured equipment. A new policy was procured to mitigate any risk to the assets being uninsured and payment was due in advance of the new award's effective date. Since this due date preceded the new award, the Ethiopia staff member made an incorrect assessment as to the award that should bear this cost.

ICAP management has reviewed this instance and believes that the inadvertent posting was an isolated event. When this was detected, ICAP management took multiple steps to reinforce the existing policy. These included a broad communication to ICAP finance staff as well as a training session focused on the matter. In addition, management has met with the specific employee who understands the oversight error. ICAP management and MSPH management, working in coordination with the Controller's Office of the Medical Center, will initiate a review to further support that this instance was isolated. This review will be completed by April 30, 2020.

Responsible person contact name: Renotta Young, Controller's Office (212) 854-4684.

Anne R. Sullivan

Executive Vice President for Finance and

Information Technology, Finance