

National Institute of
Allergy and
Infectious Diseases



Fiscal Year 2018 Fact Book



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
National Institute of Allergy and Infectious Diseases



NIAID Mission

The mission of the National Institute of Allergy and Infectious Diseases is to conduct and support basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases.

(Cover) This image was taken from the NIH Twitter account, as part of their #ThisIsNIH series.

All images are courtesy of the National Institute of Allergy and Infectious Diseases.

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Letter From the Director

The National Institute of Allergy and Infectious Diseases (NIAID) conducts and supports basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases. Through our broad basic research portfolio, NIAID continues to expand the understanding of pathogen biology and host responses to microbes, and of the mechanisms of normal immune system function and dysfunction that underlie allergy, asthma, autoimmune disease, and transplant rejection. With NIAID support, scientists also design, develop, and test new diagnostics, treatments, and vaccines that can be deployed to protect and treat people worldwide.

In fiscal year (FY) 2018, NIAID continued to lead fundamental research efforts to enhance responses to emerging public health threats. Preparedness for infectious disease threats that require a rapid response, such as the 2018 outbreaks of Ebola virus disease in the Democratic Republic of the Congo (DRC) and Lassa fever in Nigeria, can save countless lives and may even stop a disease outbreak from developing into a pandemic. In this regard, NIAID is supporting research evaluating monoclonal antibodies (mAbs)—antibodies that precisely bind to a single target—to treat important infectious diseases. mAbs could serve as first-line interventions to prevent or slow outbreaks, especially while vaccines are being developed. During the 2018 Ebola outbreaks, the DRC approved the compassionate use of several experimental therapies, including ZMapp, a cocktail of three mAbs targeting Zaire Ebola virus, and mAb114. NIAID researchers originally isolated mAb114 from a human survivor of the 1995 Ebola outbreak in the DRC.

Each year, seasonal influenza causes 12,000 to 79,000 deaths and 140,000 to 960,000 hospitalizations in the United States. Seasonal influenza vaccines must be updated yearly and have suboptimal efficacy rates ranging from 10 percent to 60 percent. NIAID supports a broad research program to improve seasonal influenza vaccines, including the use of adjuvants that may



NIAID Director Anthony S. Fauci, M.D. Credit: NIAID

enhance and broaden protection against diverse influenza strains. Along with improving seasonal influenza vaccine approaches, the Institute also is working toward a “universal” influenza vaccine that could provide robust, long-lasting protection against multiple strains of influenza, including emerging strains that could cause a global pandemic. In support of this goal, NIAID-funded researchers demonstrated that a unique, multi-domain antibody derived from llamas showed promise in protecting against multiple influenza strains. In 2019, NIAID will establish the Collaborative Influenza Vaccine Innovation Centers (CIVICs)—a multidisciplinary program to support the research and development of promising new influenza vaccine candidates. NIAID also is planning a cohort study in infants to examine how initial and repeated exposures to influenza viruses shape immunity to future influenza exposures and vaccines. These studies will inform the design of universal influenza vaccine strategies.

Tuberculosis (TB) remains the leading infectious cause of death and is among the top ten causes of death worldwide. Although drug-sensitive (DS) TB is treatable, curative therapy typically requires a cumbersome six-month, four-drug regimen with substantial toxicities. Inadequate treatment can lead to multidrug-resistant TB (MDR-TB) resistant to the two most effective anti-TB drugs, rifampin (RIF) and isoniazid (INH), and also to extensively drug-resistant TB (XDR-TB), which is resistant to many additional TB drugs. In 2018, to help reduce the burden of this devastating disease and support the World Health Organization (WHO) goal of ending the TB epidemic by 2035, NIAID developed the NIAID Strategic Plan for Tuberculosis Research.

The plan outlines a multipronged effort to address fundamental TB research questions and to stimulate the clinical translation of promising diagnostic, therapeutic, and vaccine candidates. NIAID presented key elements of the plan at the United Nations General Assembly High-Level Meeting on Ending TB in September 2018.

Since AIDS was first described in the early 1980s, a sustained NIAID research effort has helped transform the lives of people living with HIV. Lifesaving antiretroviral therapy (ART) has led to marked reductions in deaths and illness due to HIV and its associated coinfections, comorbidities, and other complications. Today, ART can provide a near-normal life expectancy by reducing the levels of HIV in a person's body to undetectable levels. People on ART with undetectable viral levels have improved health and also do not transmit virus to their uninfected sexual partners. Additionally, pre-exposure prophylaxis (PrEP) is a highly effective strategy whereby people at risk of HIV infection take a daily antiretroviral pill to prevent the acquisition of HIV. The challenge of taking HIV medicines every day limits the efficacy of this approach, so NIAID is assessing longer-acting therapies for HIV prevention, including injectable drugs and mAbs, that might require doing once a month or even less frequently.

In addition to infectious health threats, diseases and conditions related to the immune system affect millions of Americans. NIAID is the lead Institute at the National Institutes of Health for research on food allergies, which affect approximately 6 percent of children and 4 percent of adults in the United States. In a recent study, NIAID-funded investigators found that red meat allergies are linked to a bite from the lone star tick, which can induce an allergic response against a sugar molecule called alpha-gal, found in most mammalian meat. In June 2018, NIAID held a scientific agenda-setting workshop on the prevention and treatment of alpha-gal allergy that identified research priorities in this field. NIAID also has continued to build on the transformational Learning Early About Peanut (LEAP) study, which changed clinical practice guidelines for the prevention of peanut allergy,

by expanding clinical research capacity to improve diagnosis and speed the development of prevention and treatment strategies for other food allergies. NIAID-supported researchers also provided groundbreaking evidence that oral immunotherapy (OIT)—repeated exposures to small, increasing amounts of an allergen—may be effective in treating allergy to single foods, such as peanut or egg.

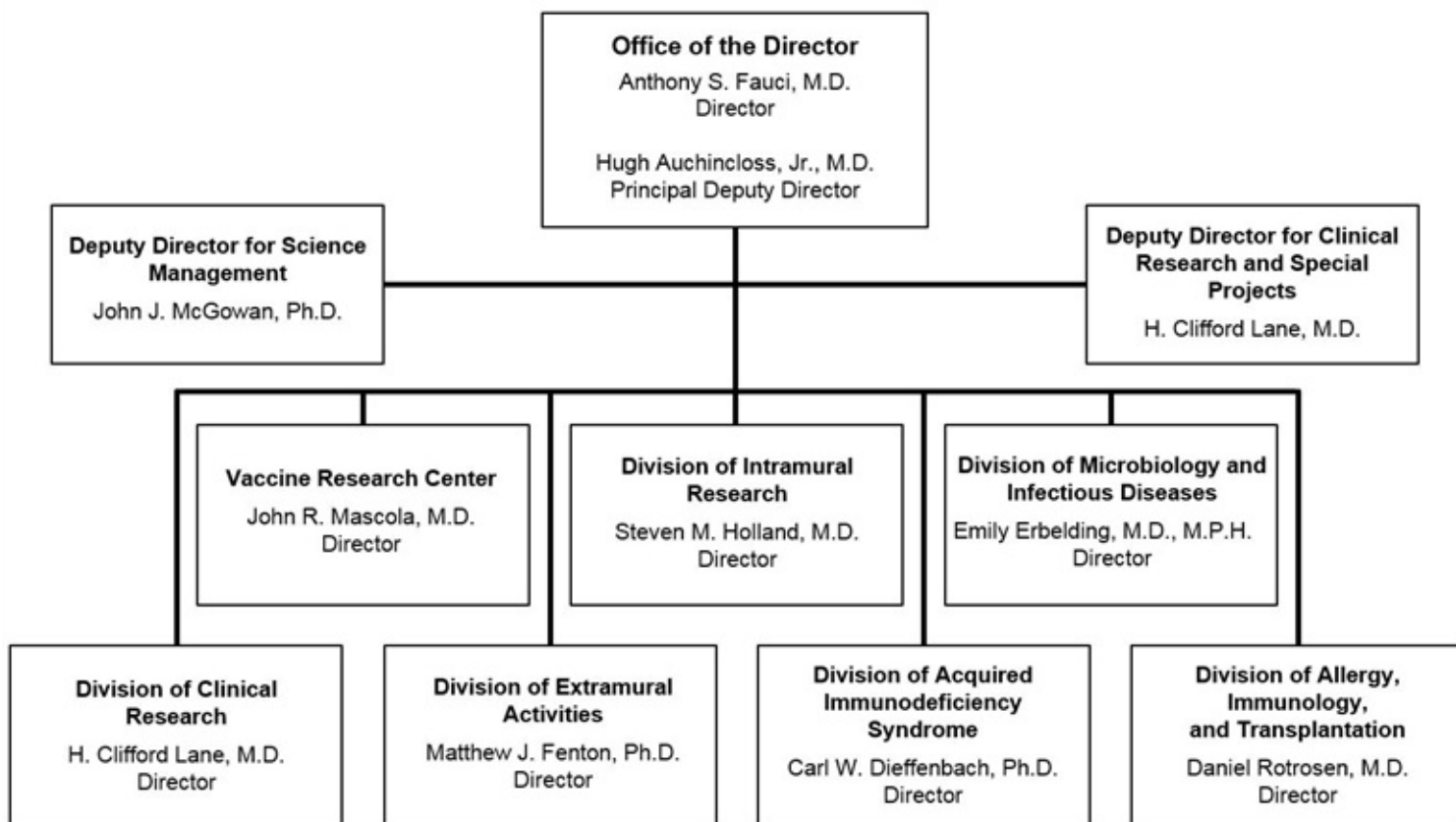
This FY 2018 Fact Book summarizes the financial policies and mechanisms that enable the Institute to support research and research training activities critical to advancing the NIAID mission. With basic and applied research, the Institute will continue to advance the development of vaccines, therapeutics, and diagnostics to improve health and save lives worldwide.

Anthony S. Fauci, M.D.

Director, National Institute of Allergy and Infectious Diseases
National Institutes of Health

Organizational Overview

National Institute of Allergy and Infectious Diseases



Additional information about NIAID's organizational structure can be found at: <https://www.niaid.nih.gov/about/niaid-organization>

NIAID—A Year in Review

NIAID was appropriated \$5.3 billion in FY 2018. The appropriation enabled continuing research efforts to better understand, identify, treat, and ultimately prevent infectious, immunologic, and allergic diseases and to develop new therapies, vaccines, and diagnostic tests.

NIAID's primary commitment is to scientific studies proposed by researchers (considered investigator-initiated or unsolicited research) who work in universities, medical schools, and other research institutions across the United States and abroad, with an appropriate balance for NIAID research areas identified as high priority by NIAID.

The *Fact Book* summarizes how FY 2018 funding was distributed among NIAID research programs and funding mechanisms, provides comparisons with prior year allocations, and outlines the funding policies influencing grant awards.

Budget Highlights

- NIAID received \$5.3 billion in appropriated funds, an increase of \$357 million over FY 2017's operating level.
- NIAID distributed funds across the three mission areas: Biodefense and Emerging Infectious Diseases (BioD), 38.9 percent; HIV/AIDS, 32.0 percent; and Infectious and Immunologic Diseases (IID), 29.1 percent.
- Approximately 80.8 percent of the total NIAID budget was awarded to the extramural research community. This includes 59.9 percent to Research Project Grants (RPGs), 17.6 percent to Research and Development (R&D) contracts, 0.7 percent to Research Centers, 1.4 percent to Other Research, and 1.1 percent to Training. The remaining 19.2 percent supported Intramural Research (12.9 percent) and Research Management Support (6.3 percent).
- NIAID increased funding for RPGs by \$254 million over FY 2017, allowing the Institute to fund a total of 4,690 RPGs in FY 2018.

- Approximately 23 percent of competing R01 awards were made to new investigators, defined as principal investigators (PIs) who have not previously competed successfully as a PI for a significant NIH independent research award.
- NIAID's success rate for competing RPGs was 22.9 percent, a rate higher than the overall NIH success rate of 20.9 percent.
- NIAID supported 1,435 international projects in 125 countries, totaling approximately \$704 million.

Financial Management Plan

- Renewal Grants: Capped at 20 percent—applicants could request up to 20 percent more than the funding level of the previous grant.
- Noncompeting Awards: Funded at fully committed levels.
- Competing Applications: Awarded without programmatic reductions.
- Selective pay: NIAID set aside \$9 million (\$3 million for each extramural program division). Note: Investigators cannot apply for selective pay funding but are nominated by NIAID program officers from the pool of meritorious R01 applications.
- R56 Bridge awards: NIAID set aside \$18 million (\$6 million for each extramural program division). Note: Investigators cannot apply for R56 Bridge awards but are nominated by NIAID program officers from the pool of meritorious R01 applications.

NIAID Budget History

NIAID Obligation History

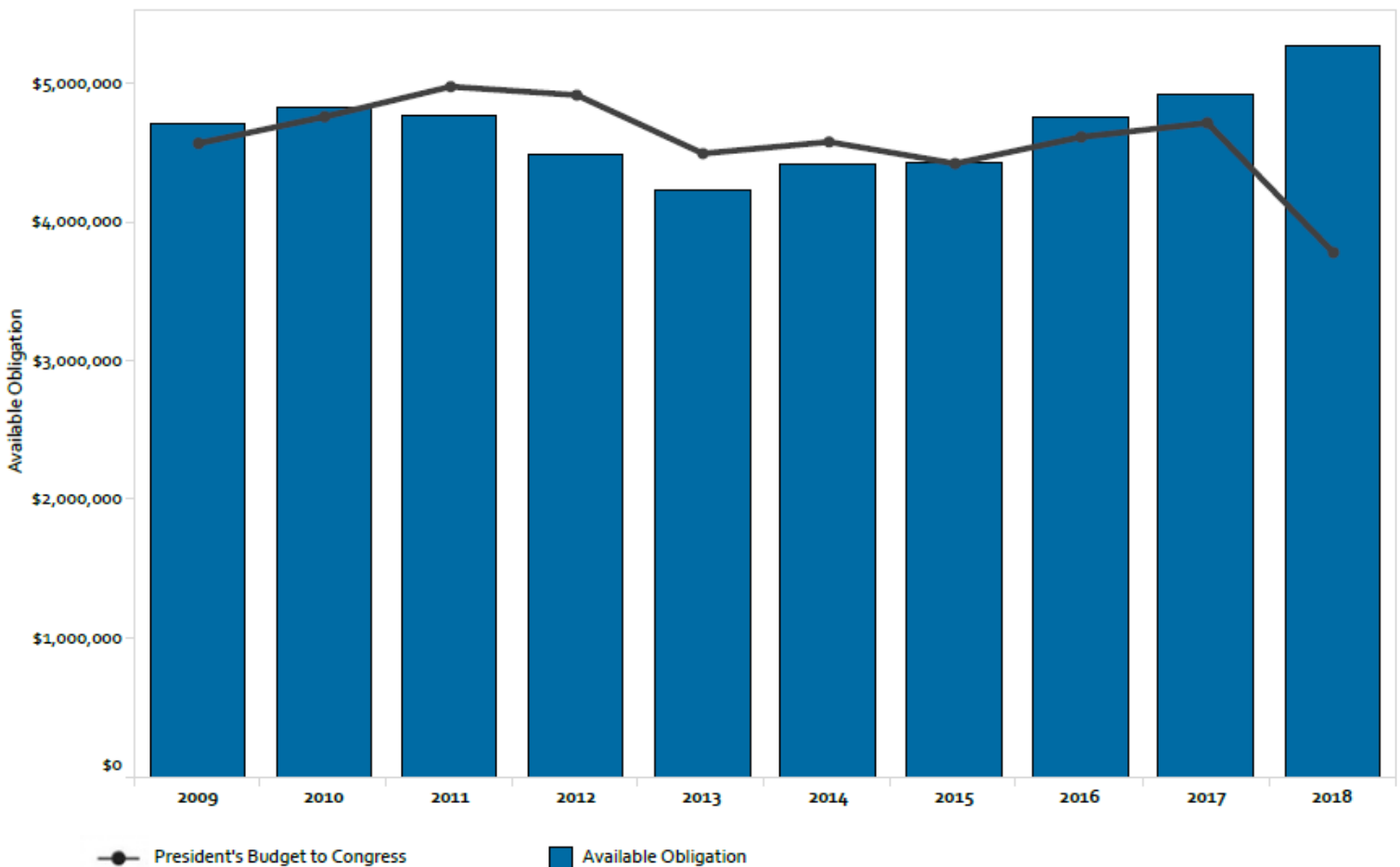
Funding (Dollars in Thousands)

Fiscal Year	President's Budget to Congress	Available Obligation *
2009 ^{1,2}	\$4,568,778	\$4,701,456
2010 ^{1,2}	\$4,760,295	\$4,816,055
2011 ¹	\$4,977,070	\$4,768,181
2012	\$4,915,970	\$4,482,369
2013	\$4,495,307	\$4,230,067
2014	\$4,578,813	\$4,401,185
2015 ³	\$4,423,357	\$4,417,529
2016 ³	\$4,614,779	\$4,749,884
2017	\$4,715,697	\$4,905,708
2018	\$3,782,670	\$5,262,397

* Available Obligations as reported in NIAID's annual Congressional Justification, Amounts Available for Obligation table
 1 FY 2009–FY 2011 include pass through funding (\$300 million, \$300 million and \$297 million respectively) for the Global Fund to Fight AIDS, Tuberculosis and Malaria
 2 FY 2009–FY 2010 exclude American Recovery and Reinvestment Act funds
 3 FY 2015–FY 2016 exclude supplemental Ebola funding of \$238 million

NIAID Budget History

Funding (Dollars in Thousands)



NIAID Funding by Mission

Funding for NIAID falls into three missions:

- Biodefense and Emerging Infectious Diseases (BioD)
- HIV/AIDS
- Infectious and Immunologic Diseases (IID)

NIAID Actual Obligations* by Mission Funding (Dollars in Thousands)

Fiscal Year	BioD	HIV/AIDS	IID	Total
2009 ^{1,2}	\$1,640,728	\$1,541,074	\$1,519,654	\$4,701,456
2010 ^{1,2}	\$1,679,215	\$1,577,322	\$1,559,518	\$4,816,055
2011 ¹	\$1,664,854	\$1,563,349	\$1,539,978	\$4,768,181
2012	\$1,665,546	\$1,572,973	\$1,247,950	\$4,486,469
2013	\$1,572,008	\$1,481,621	\$1,181,465	\$4,235,094
2014	\$1,614,295	\$1,563,878	\$1,223,012	\$4,401,185
2015 ³	\$1,610,560	\$1,586,804	\$1,220,165	\$4,417,529
2016 ³	\$1,773,671	\$1,663,823	\$1,312,389	\$4,749,884
2017	\$1,842,236	\$1,673,531	\$1,389,941	\$4,905,708
2018	\$2,046,438	\$1,684,054	\$1,531,813	\$5,262,306

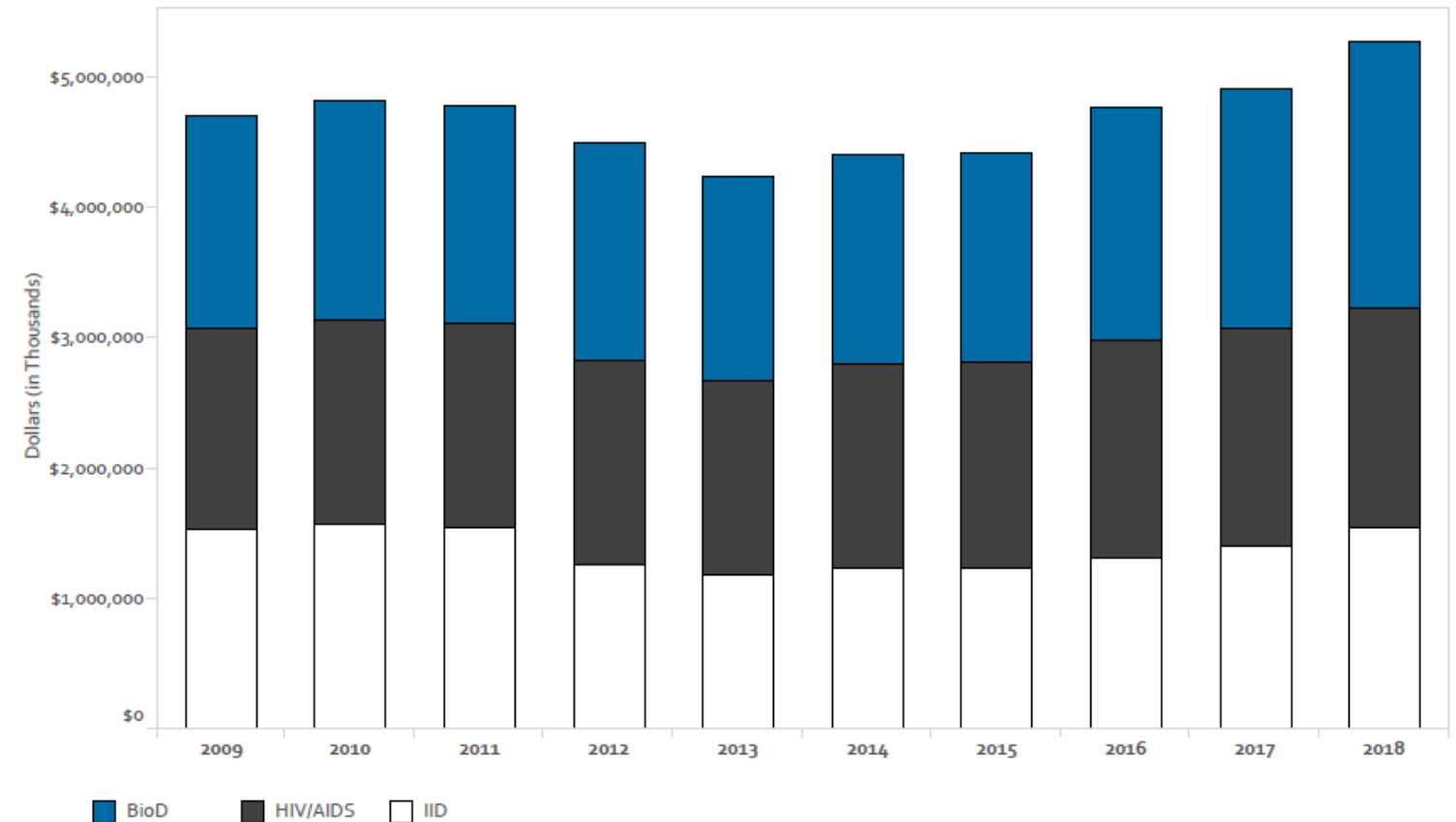
*Actual Obligation as reported in NIAID’s annual Congressional Justification, Budget Mechanism table

1 FY 2009–FY 2011 include pass through funding (\$300 million, \$300 million and \$297 million respectively) for the Global Fund to Fight AIDS, Tuberculosis and Malaria

2 FY 2009–FY 2010 exclude American Recovery and Reinvestment Act funds

3 FY 2015–FY 2016 exclude supplemental Ebola funding of \$238 million

NIAID Actual Obligations by Mission Funding (Dollars in Thousands)



NIAID Funding by Budget Mechanism

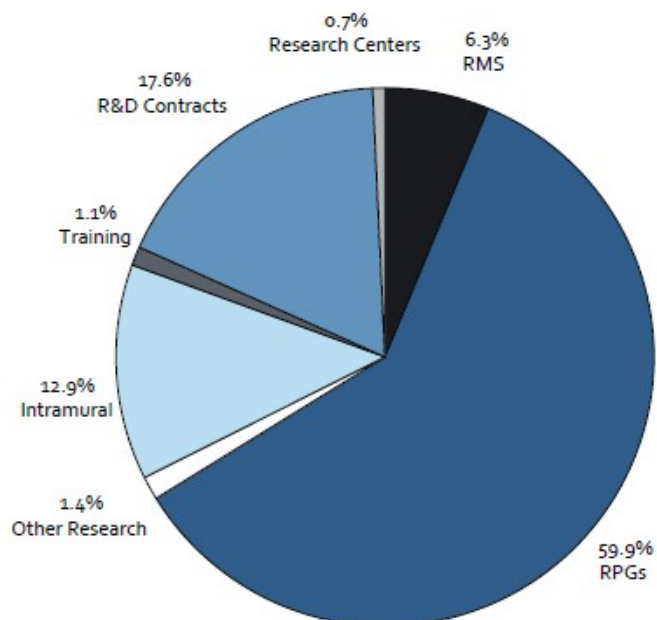
NIAID Funding by Budget Mechanism Funding (Dollars in Thousands)

	2016		2017		2018	
	Dollars	% of Total	Dollars	% of Total	Dollars	% of Total
Extramural Research Activities						
Research Project Grants (RPGs)						
Noncompeting	\$1,990,979		\$2,171,367		\$2,404,453	
Competing	\$671,035		\$584,150		\$609,008	
Subtotal, RPGs	\$2,662,014		\$2,755,516		\$3,013,461	
SBIR/STTR ¹	\$131,713		\$145,257		\$140,879	
Total Funding for RPGs	\$2,793,727	58.8%	\$2,900,773	59.1%	\$3,154,340	59.9%
Research Centers	\$37,995	0.8%	\$40,328	0.8%	\$38,115	0.7%
Other Research	\$70,552	1.5%	\$68,720	1.4%	\$74,130	1.4%
Training	\$57,124	1.2%	\$57,097	1.2%	\$59,575	1.1%
R&D Contracts	\$870,998	18.3%	\$897,339	18.3%	\$925,027	17.6%
Subtotal, Extramural	\$3,830,396	80.6%	\$3,964,257	80.8%	\$4,251,187	80.8%
Intramural	\$619,929	13.1%	\$630,641	12.9%	\$681,363	12.9%
Research Management and Support (RMS)	\$299,559	6.3%	\$310,809	6.3%	\$329,797	6.3%
NIAID Total	\$4,749,884	100.0%	\$4,905,708	100.0%	\$5,262,347	100.0%

Reflects actual obligations .

¹ SBIR/STTR programs are congressionally mandated.

NIAID Funding by Budget Mechanism: FY 2018



NIAID Research Project Grant Success Rate

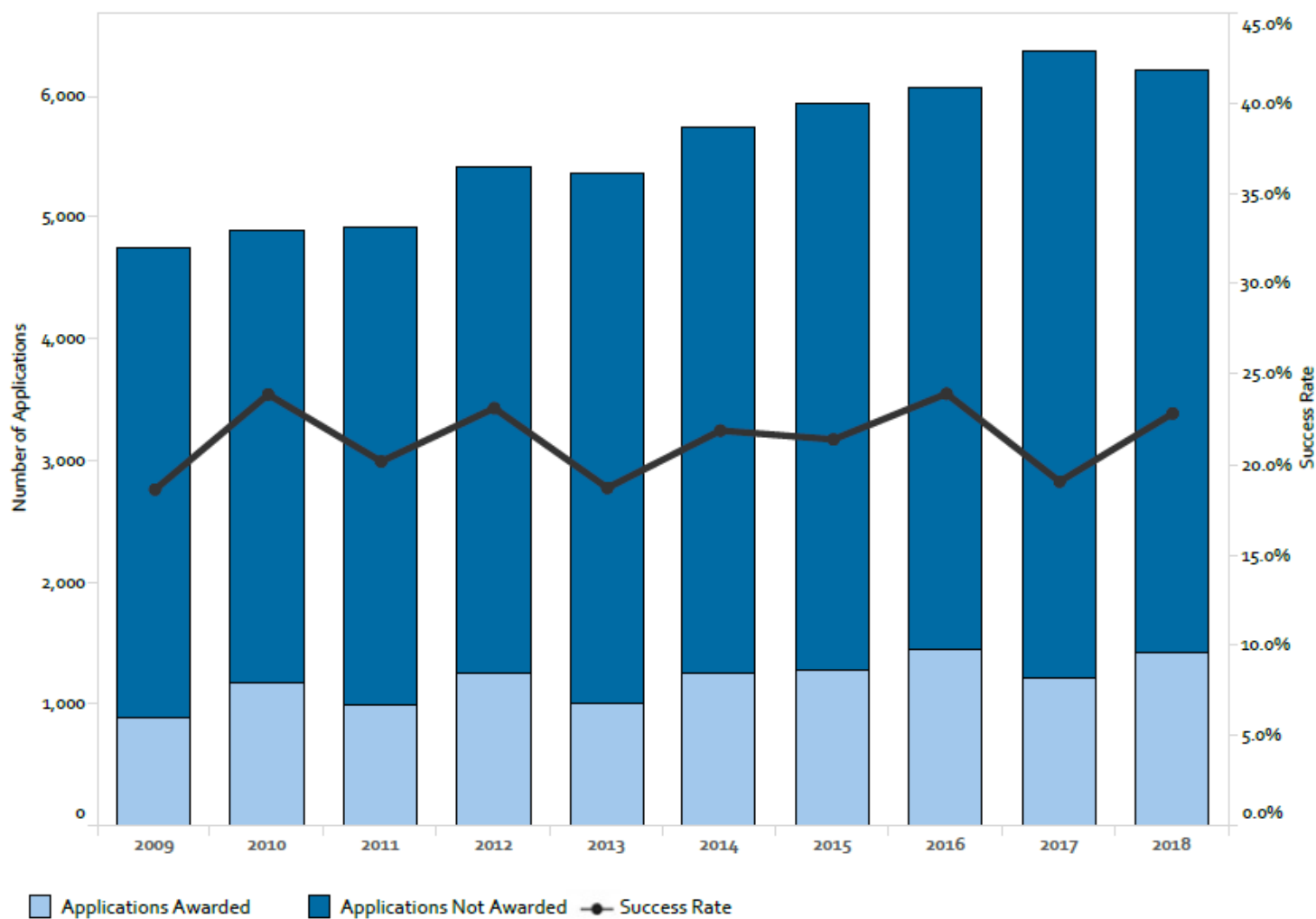
NIAID RPG Success Rate

Fiscal Year	Applications Awarded	Applications Reviewed	Success Rate
2009	887	4,749	18.7%
2010	1,170	4,889	23.9%
2011	994	4,914	20.2%
2012	1,255	5,416	23.2%
2013	1,007	5,367	18.8%
2014	1,257	5,731	21.9%
2015	1,272	5,932	21.4%
2016	1,452	6,058	24.0%
2017	1,216	6,363	19.1%
2018	1,420	6,207	22.9%

Success rates are defined as the percentage of reviewed grant applications that receive funding. They are computed on a fiscal year basis and include applications that are peer reviewed and either scored or un-scored by an Initial Review Group.

For more information, visit: https://report.nih.gov/success_rates/Success_ByIC.cfm

NIAID RPG Success Rate



NIAID Research Project Grant Applications/Awards Per Percentile

NIAID fosters innovation by using paylines and selective pay awards to fund the best projects while maintaining portfolio balance and flexibility.

Below is a histogram of the investigator-initiated R01 applications received in FY 2018 sorted by percentile score. The chart shows applications received through the 68th percentile. All applications that scored within the payline were funded except for those that were canceled for issues such as concerns over human subjects or principal investigator (PI) retirements.

FY 2018 Applications/Awards Per Percentile: Unsolicited R01/R37/R56

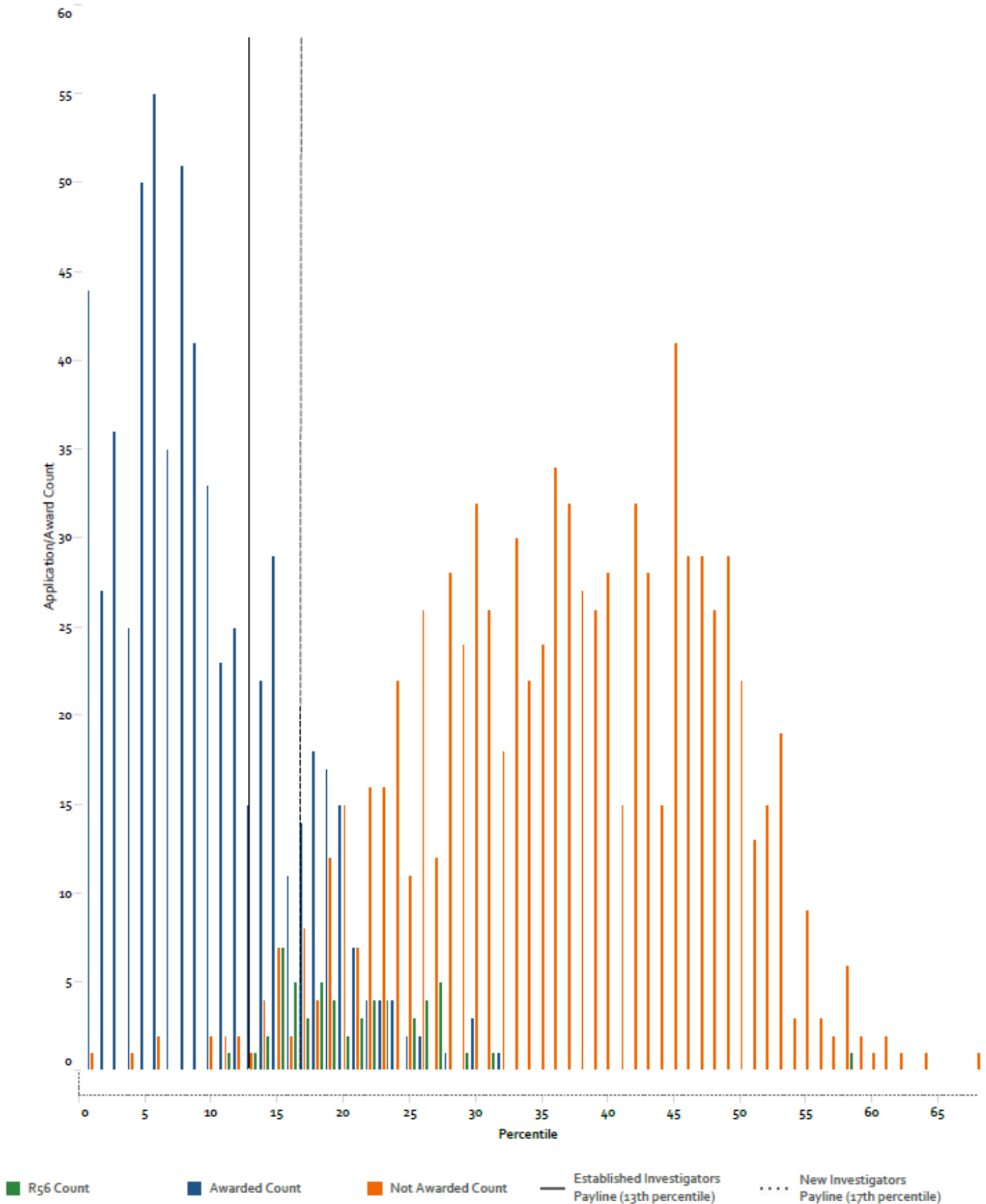
Percentile	Awarded Count	Not Awarded Count	R56 Count
1	44	1	0
2	27	0	0
3	36	0	0
4	25	1	0
5	50	0	0
6	55	2	0
7	35	0	0
8	51	0	0
9	41	0	0
10	33	2	0
11	23	2	0
12	25	2	1
13	15	1	0
14	22	4	1
15	29	7	2
16	11	2	7
17	14	8	5
18	18	4	3
19	17	12	5
20	15	15	4
21	7	7	2
22	4	16	3
23	4	16	4
24	4	22	4
25	2	11	0
26	2	26	3
27	0	12	4
28	1	28	5
29	0	24	0
30	3	32	1
31	0	26	0
32	1	18	1
33	0	30	0
34	0	22	0
35	0	24	0
36	0	34	0

NIAID Research Project Grant Applications/Awards Per Percentile

Percentile	Awarded Count	Not Awarded Count	R56 Count
37	0	32	0
38	0	27	0
39	0	26	0
40	0	28	0
41	0	15	0
42	0	32	0
43	0	28	0
44	0	15	0
45	0	41	0
46	0	29	0
47	0	29	0
48	0	26	0
49	0	29	0
50	0	22	0
51	0	13	0
52	0	15	0
53	0	19	0
54	0	3	0
55	0	9	0
56	0	3	0
57	0	2	0
58	0	6	0
59	0	2	1
60	0	1	0
61	0	2	0
62	0	1	0
63	0	0	0
64	0	1	0
65	0	0	0
66	0	0	0
67	0	0	0
68	0	1	0

NIAID Research Project Grant Applications/Awards Per Percentile

FY 2018 Applications/Awards Per Percentile: Unsolicited R01/R37/R56



NIAID-Supported National Research Service Awards

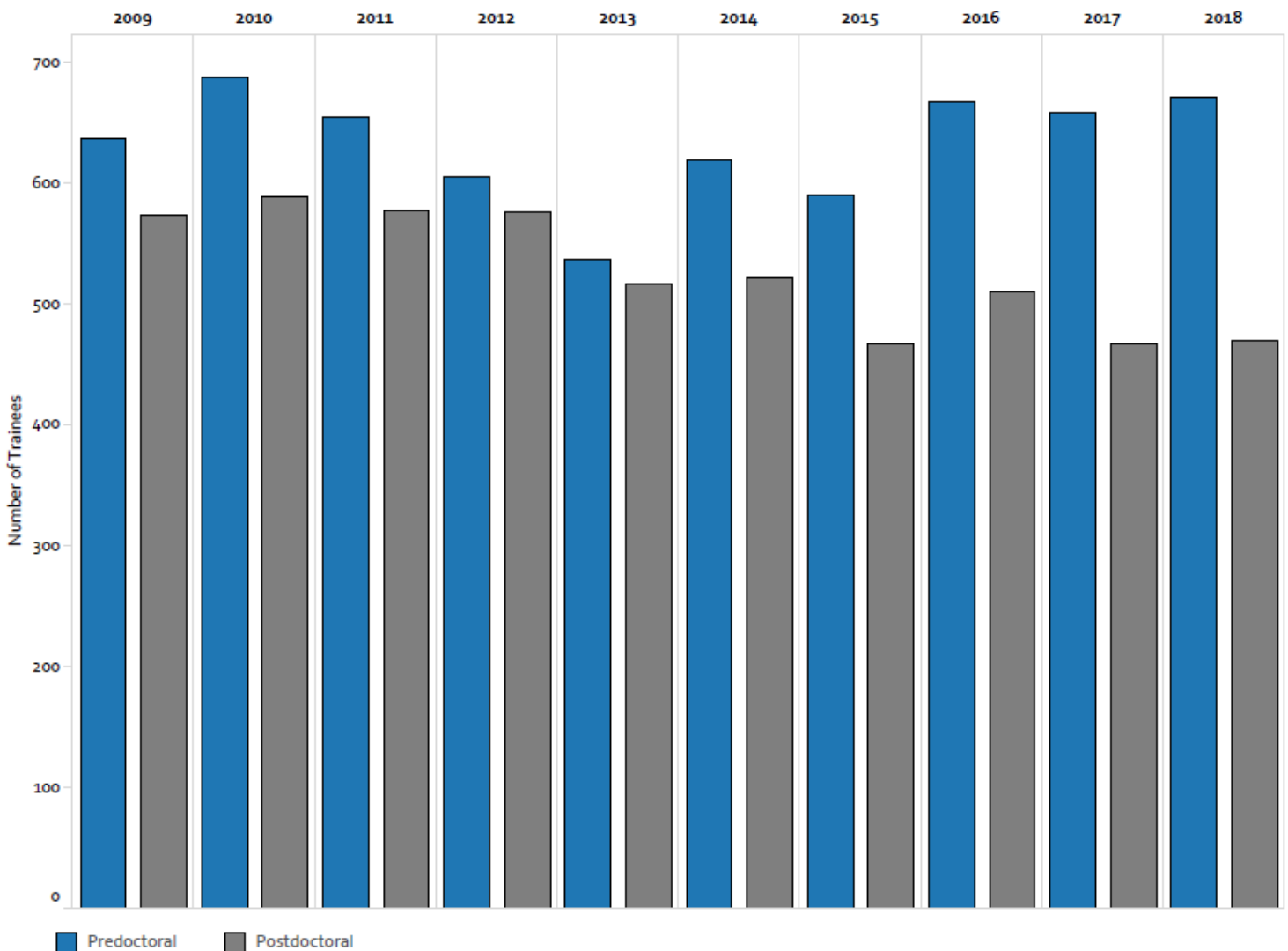
The Ruth L. Kirschstein National Research Service Award (NRSA) supports the training of biomedical, behavioral, and clinical researchers through individual pre and postdoctoral fellowships, and institutional research training grants.

NIAID-Supported National Research Service Awards by Fiscal Year

Trainee	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Postdoctoral	573	589	577	576	516	521	468	511	467	470
Predocctoral	637	687	654	605	537	619	590	666	658	670
Total	1,210	1,276	1,231	1,181	1,053	1,140	1,058	1,177	1,125	1,140

National Research Service Awards include the following activity codes: T32, T35, F30, F31, and F32.

NIAID-Supported National Research Service Awards by Fiscal Year

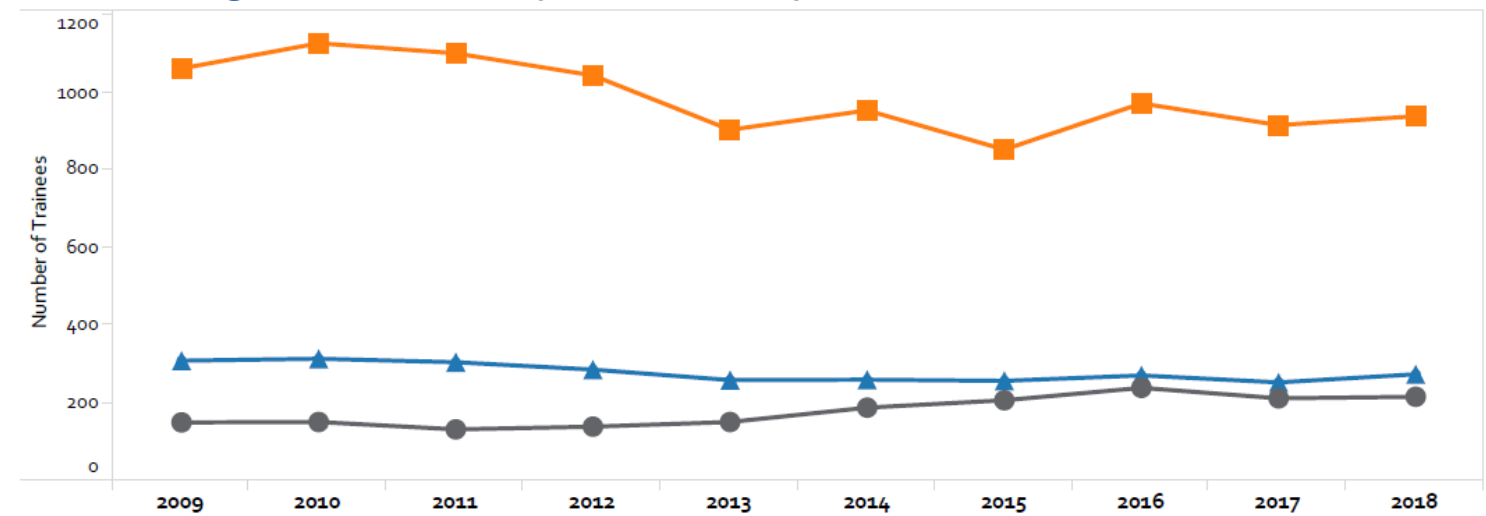


NIAID Training and Career Development Awards by Mechanism: Funding (Dollars in Thousands)

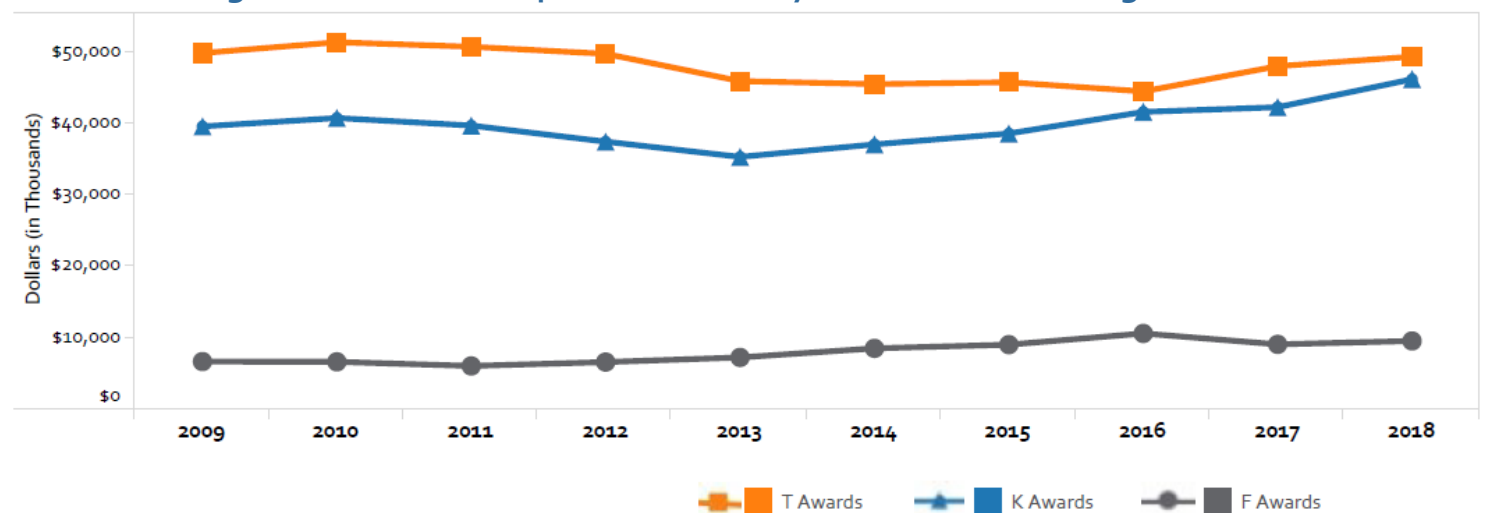
Fiscal Year	F Awards		K Awards		T Awards	
	Number of Training Positions	Dollars	Number of Training Positions	Dollars	Number of Training Positions	Dollars
2009	149	\$6,674	308	\$39,587	1,061	\$49,857
2010	150	\$6,635	313	\$40,763	1,126	\$51,365
2011	131	\$6,059	304	\$39,707	1,100	\$50,738
2012	138	\$6,602	285	\$37,453	1,043	\$49,748
2013	150	\$7,251	258	\$35,322	903	\$45,928
2014	187	\$8,522	259	\$37,071	953	\$45,507
2015	206	\$9,041	256	\$38,594	852	\$45,768
2016	238	\$10,608	270	\$41,613	971	\$44,485
2017	211	\$9,081	252	\$42,278	915	\$48,016
2018	215	\$9,555	273	\$46,186	938	\$49,351

For additional information on training, career development, and fellowship awards, visit: <http://grants.nih.gov/training/extramural.html>

NIAID Training and Career Development Awards by Mechanism: Number of Trainees



NIAID Training and Career Development Awards by Mechanism: Funding



NIAID Funding for Selected Pathogens, Diseases, and Conditions

Pathogens, Diseases, and Conditions: FY 2018 Funding (Dollars in Thousands)

Pathogens, Diseases and Conditions	
Allergic Rhinitis (Hay Fever)*	\$3,922
Anthrax*	\$36,122
Arthritis*	\$24,038
Asthma*	\$88,739
Autoimmune Disease*	\$226,107
Cholera	\$19,940
Dengue	\$55,283
Diabetes*	\$25,267
Digestive Diseases*	\$425,716
Ebola**	\$134,421
Emerging Infectious Diseases*	\$2,261,608
Food Allergies*	\$49,629
Fungal diseases	\$98,193
Hepatitis - C*	\$43,698
Hepatitis*	\$152,706
HIV/AIDS*	\$1,684,054
Infectious Diseases*	\$3,819,120
Inflammatory Bowel Disease*	\$27,363
Influenza*	\$290,026
Lupus*	\$50,255
Lyme Disease*	\$27,419
Malaria*	\$167,985
Multiple Sclerosis*	\$31,912
Parasitic diseases	\$344,611
Pediatric AIDS*	\$51,353
Pediatric Research*	\$388,764
Pneumonia & Influenza*	\$373,433
Primary Immune Deficiency Diseases	\$62,723
Staphylococcus aureus	\$69,090
Tropical medicine	\$705,796
Tuberculosis*	\$352,445
Vector-Borne Diseases*	\$523,960

Other Research	
Antimicrobial Resistance*	\$424,186
Biodefense*	\$2,046,438
Chemical Countermeasures Research**	\$49,190
Immune Tolerance	\$234,980
Prevention*	\$2,019,880
Radiological/Nuclear Research**	\$47,993
Stem Cell Research*	\$88,612
Topical Microbicides*	\$78,039
Transplantation*	\$183,388
Vaccine Related (AIDS)*	\$513,852

* Represents topics and funding levels reported using the NIH Research, Condition, and Disease Categorization (RCDC) process.

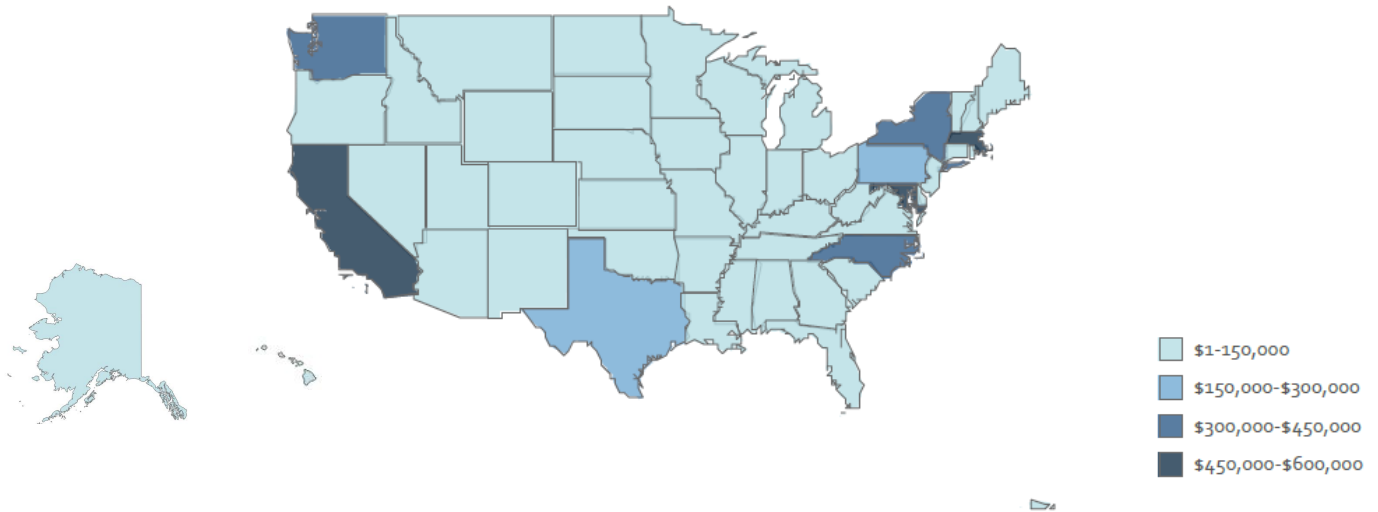
** NIAID coordinates/manages these programs on behalf of NIH.

For more information on RCDC funding, visit:
http://report.nih.gov/categorical_spending.aspx

NIAID Extramural Research Funding by U.S. States and Territories

Funding by U.S. States and Territories: FY 2018

Funding (Dollars in Thousands)



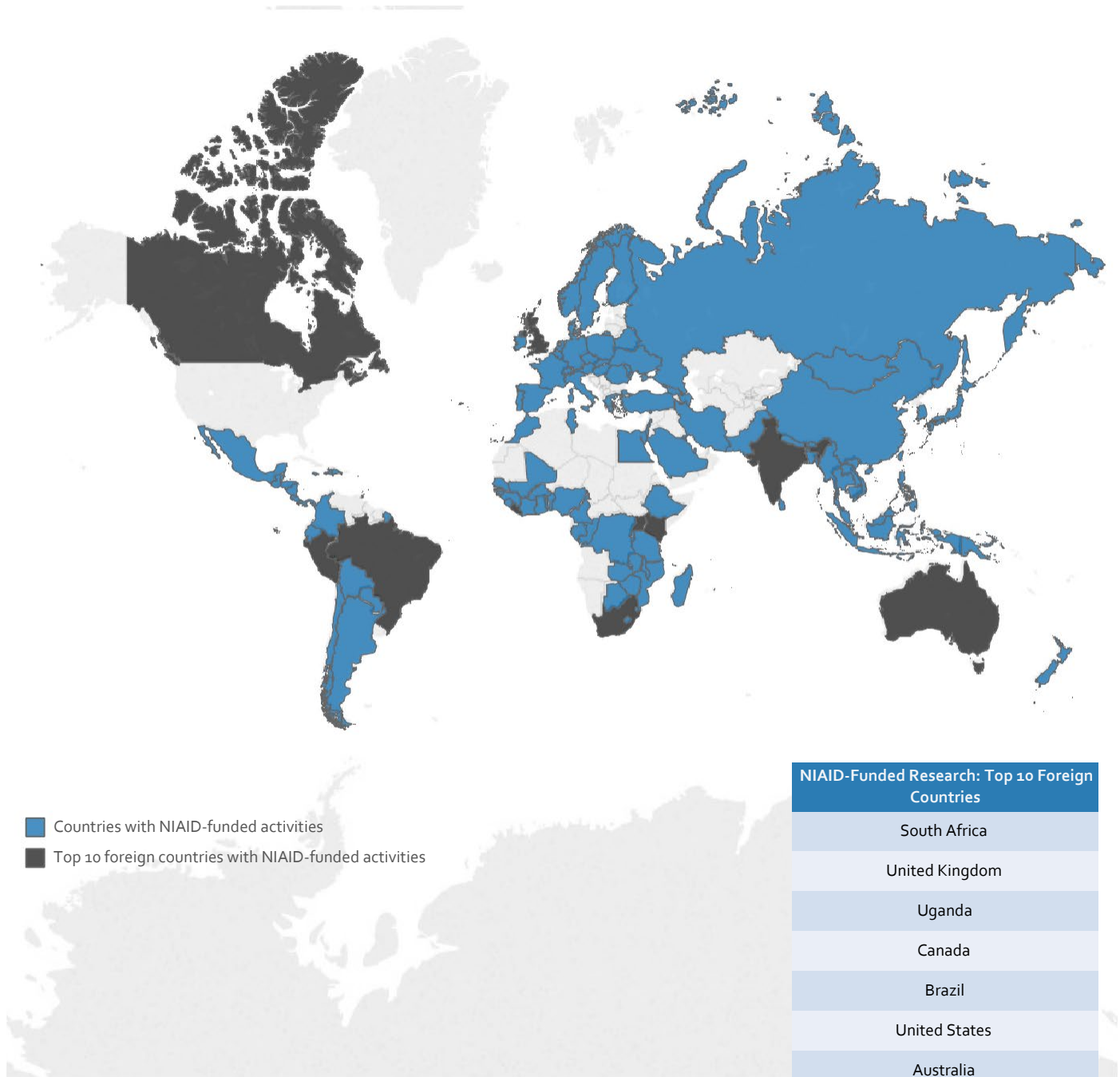
State	Funding (Dollars in Thousands)
Alabama	\$58,599
Alaska	\$369
Arizona	\$18,963
Arkansas	\$4,421
California	\$531,401
Colorado	\$57,316
Connecticut	\$60,803
Delaware	\$107
District of Columbia	\$61,664
Florida	\$65,374
Georgia	\$132,625
Hawaii	\$18,132
Idaho	\$1,136
Illinois	\$103,890
Indiana	\$34,636
Iowa	\$24,134
Kansas	\$14,889
Kentucky	\$17,517
Louisiana	\$31,659
Maine	\$4,701
Maryland	\$525,422
Massachusetts	\$466,865
Michigan	\$51,700
Minnesota	\$39,278
Mississippi	\$1,752
Missouri	\$79,304
Montana	\$20,720

State	Funding (Dollars in Thousands)
Nebraska	\$14,185
Nevada	\$2,861
New Hampshire	\$14,204
New Jersey	\$37,408
New Mexico	\$13,330
New York	\$362,352
North Carolina	\$344,631
North Dakota	\$2,121
Ohio	\$96,267
Oklahoma	\$14,780
Oregon	\$34,751
Pennsylvania	\$237,261
Puerto Rico	\$3,639
Rhode Island	\$14,732
South Carolina	\$14,031
South Dakota	\$1,542
Tennessee	\$94,878
Texas	\$172,201
Utah	\$26,807
Vermont	\$3,606
Virginia	\$74,956
Washington	\$360,096
West Virginia	\$322
Wisconsin	\$64,264
Wyoming	\$1,028

Grand Total	\$4,433,630
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NIAID International Research Funding

Global Health Research at NIAID: FY 2018 Funding (Dollars in Thousands)



NIAID-Funded Research: Top 10 Foreign Countries	
South Africa	
United Kingdom	
Uganda	
Canada	
Brazil	
United States	
Australia	
Kenya	
India	
Liberia	

For more information on NIAID's role in global research, visit:
<https://www.niaid.nih.gov/research/global-research>



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
National Institute of Allergy and Infectious Diseases