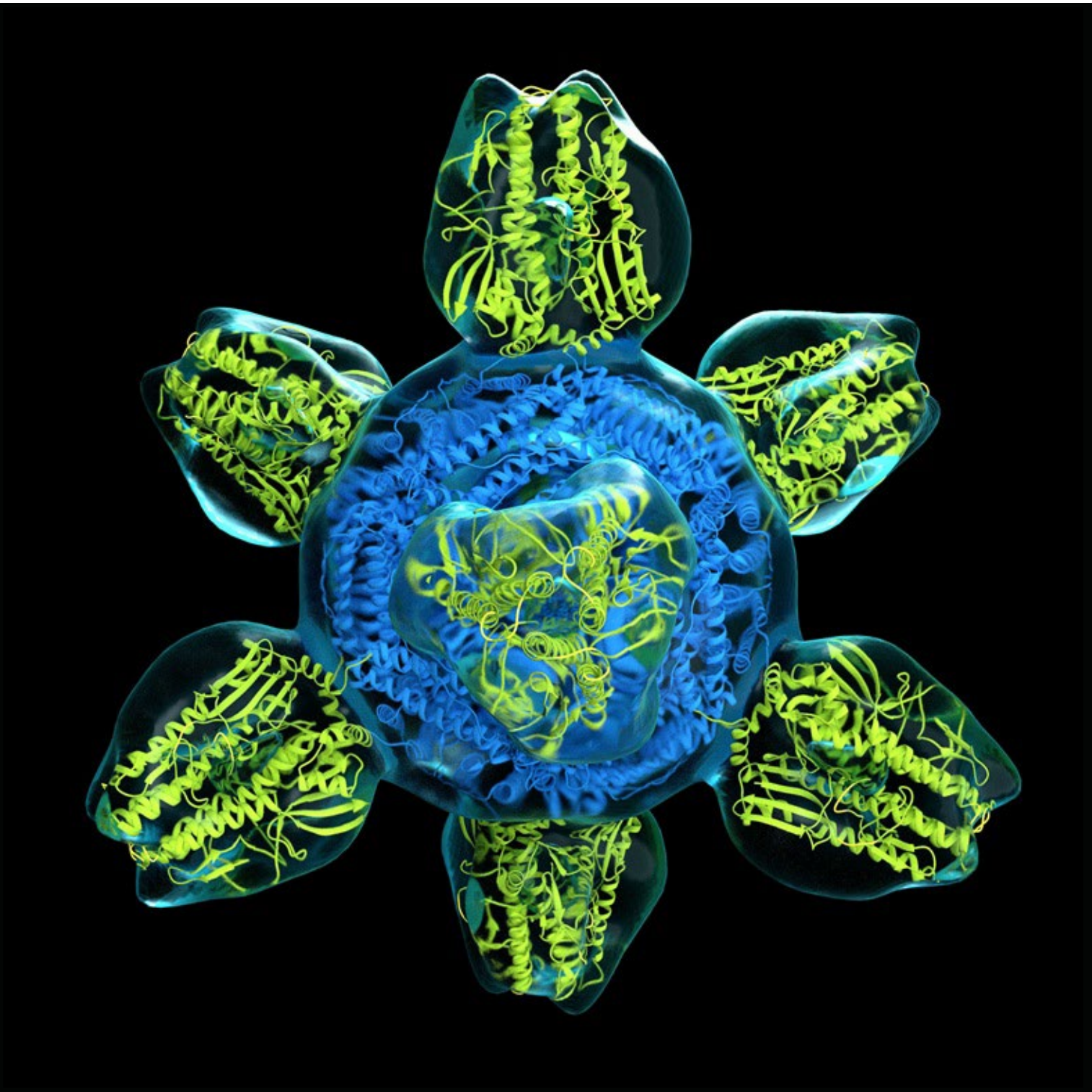
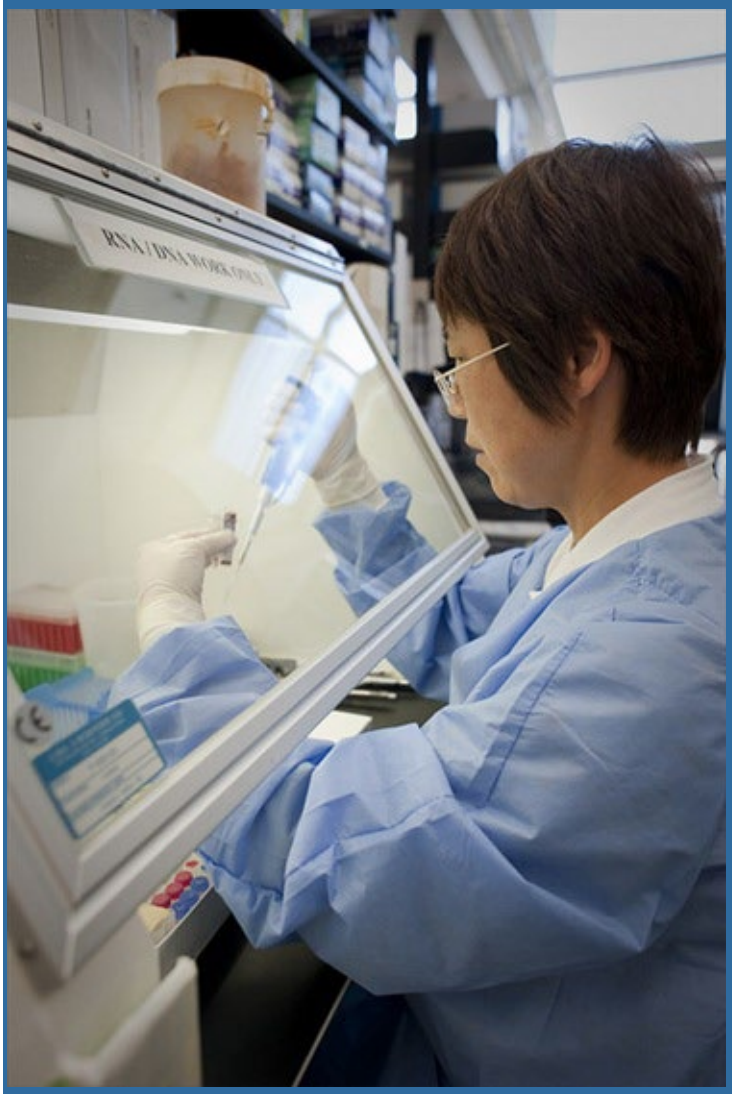


National Institute of Allergy and Infectious Diseases

Fiscal Year 2017 Fact Book

NIH National Institute of Allergy and Infectious Diseases

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) Colorized structure of a prototype for a universal flu vaccine. The nanoparticle is a hybrid of a protein scaffold (blue) and eight influenza hemagglutinin proteins on the surface (yellow).

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 research to better understand, diagnose, prevent, treat, and ultimately cure infectious, immunologic, and allergic diseases. NIAID-funded research ranges from studies of the fundamental mechanisms of infectious and immunologic diseases, which pave the way for future progress, to applied projects to develop new diagnostics, therapeutics, and vaccines that will improve public health. Through continual efforts to confront established infectious diseases, NIAID also stands ready to lead the biomedical response to emerging and re-emerging diseases that continue to threaten the health of people worldwide.

In fiscal year (FY) 2017 NIAID advanced research on many emerging infections, including those caused by chikungunya, dengue, and Zika viruses, and worked to develop effective medical countermeasures and strategies to enable swift research responses to infectious diseases outbreaks. For example, when Zika virus infections spread across the Americas in 2015–2016, NIAID quickly mobilized to help develop several promising Zika vaccine candidates. One of these vaccine candidates is now being tested in an international Phase 2 clinical trial. NIAID also continues to test vaccine strategies to protect against future Ebola virus outbreaks. In FY 2017, as part of an international consortium involving health authorities in West Africa, the French National Institute of Health and Medical Research, and the London School of Hygiene & Tropical Medicine, NIAID initiated a Phase 2 placebo-controlled clinical trial of three promising Ebola vaccine strategies. The study will enroll approximately 4,000 individuals to evaluate whether the vaccine regimens can safely induce protective immune responses against Ebola virus. NIAID also is working to develop more effective vaccines and treatments against tuberculosis (TB), the infectious disease that casues most deaths globally, and testing approaches to treating multidrug-resistant TB, which is increasingly prevalent.

As highlighted by the unusually severe 2017–2018 flu season, influenza continues to impose a substantial health and economic burden on the United States and worldwide.NIAID supports comprehensive research to

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

better understand the immune responses to influenza infection and vaccination, to develop more effective vaccines and immune response–boosting agents known as adjuvants, and to improve and modernize vaccine production methods. These efforts include several strategies to develop vaccines that can generate long-lasting protection against multiple seasonal and pandemic influenza strains, with the ultimate goal of creating a "universal" influenza vaccine, a top priority for NIAID. In June 2017, NIAID convened a workshop where experts from various disciplines identified key research gaps and potential solutions. Findings from the workshop informed the development of a recent publication, *A Universal Influenza Vaccine: The Strategic Plan for the National Institute of Allergy and Infectious Diseases.*

NIAID continues its commitment to countering the growing global problem of antibiotic resistance. The Antibacterial Resistance Leadership Group (ARLG), established by NIAID in 2013, is implementing its ambitious clinical research agenda to address antibiotic resistance. In 2017, the ARLG launched a multicenter clinical study to better understand the risks and infection outcomes pertaining to carbapenem-resistant *Klebsiella pneumoniae* and other Enterobacteriaceae, which cause a broad range of human infections, and to identify barriers to patient enrollment in clinical trials. NIAID-supported researchers also identified novel antibiotics, known as humimycins, with activity against methicillin-resistant *Staphylococcus aureus* (MRSA) bacteria and identified a bacterial ecosystem that could be given therapeutically to protect against *Clostridium difficile* infection.

NIAID-funded clinical trials suggest that two inexpensive FDA-approved antibiotics are effective in treating MRSA skin infections, countering the belief that antibiotics provide little help for these infections. NIAID also is a partner in the Combating Antibiotic-Resistant Bacteria Accelerator program, a global public-private partnership to speed the development of treatments for the world's most serious bacterial threats.

NIAID's sustained investment in HIV/AIDS research is bringing within reach the goal of an "AIDS-free generation," in which new HIV infections and deaths from HIV are rare. Lifesaving antiretroviral therapy (ART) has markedly reduced deaths and illness due to HIV and its associated coinfections and complications. In addition, large studies have shown that when ART suppresses HIV to undetectable levels in an infected person, the virus does not transmit to that person's uninfected sexual partner. Because adherence to daily treatment is challenging for many people living with HIV/AIDS, NIAID is developing and testing long-acting forms of ART that could be easier to use, less toxic, and more cost effective than current treatments. In FY 2017, NIAID scientists and their industry partners created an antibody that binds to three critical sites on HIV and thus should be harder for the virus to evade than natural, single antibodies. This laboratory-made antibody protected monkeys from infection with two strains of an HIV-like virus. Plans are underway to conduct early-phase clinical trials of the antibody in healthy people and in people living with HIV in the hope that it could eventually be used for long-acting HIV prevention and treatment. Multiple ongoing efforts seek to achieve sustained, long-term remission of HIV, and to develop a safe, effective, and durable HIV vaccine that can be used in combination with other prevention approaches, which is the best long-term hope for ending the HIV/AIDS pandemic.

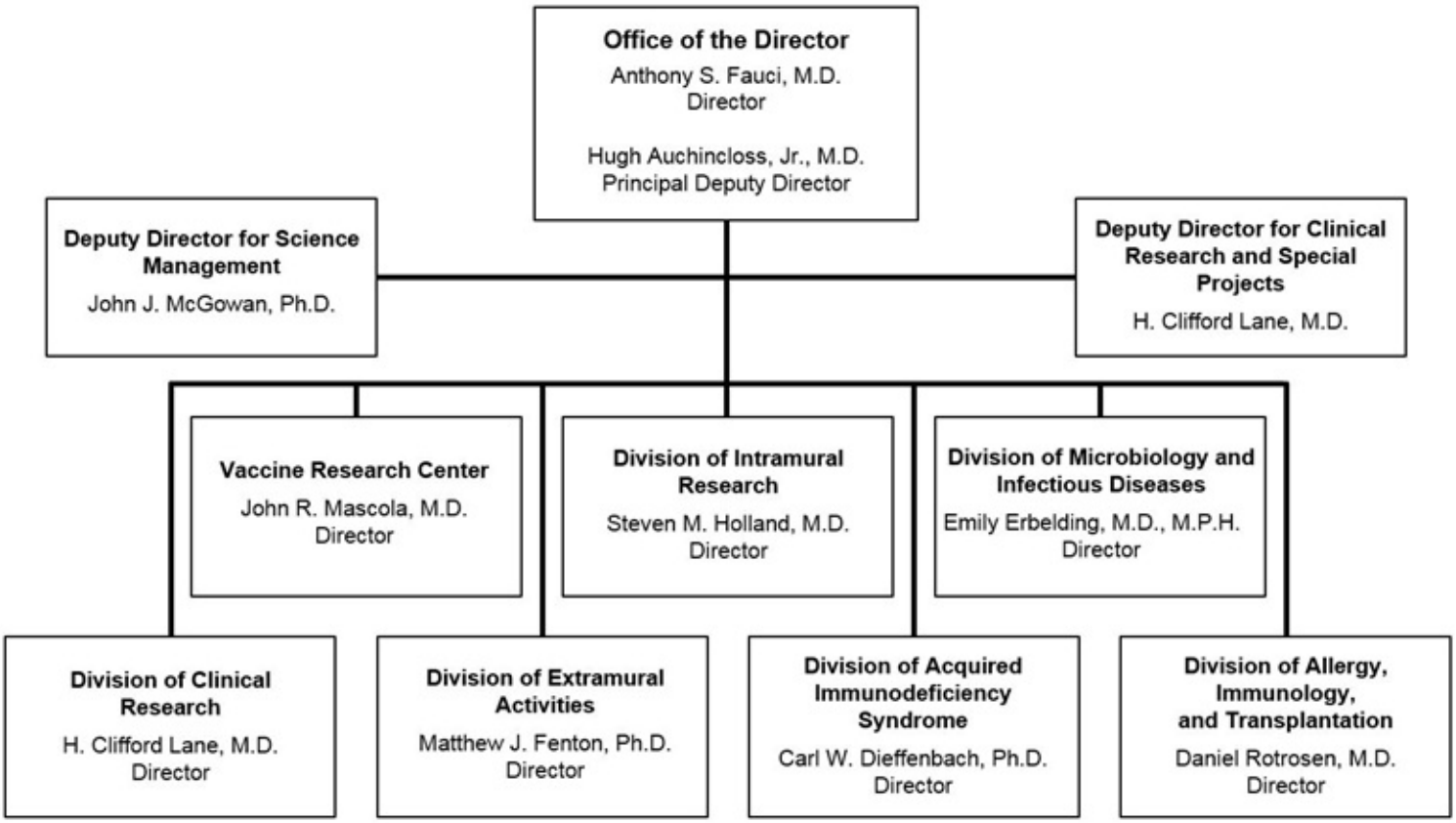
The Institute also supports research to understand the mechanisms of regulation of the human immune response and to develop and test novel approaches to treat and prevent immune-mediated disorders, including asthma, allergic diseases, autoimmune diseases, and the rejection of transplanted organs, tissues, and cells. NIAID-supported basic and clinical research is advancing progress toward new and better treatments for immune-mediated diseases. For example, a recent clinical trial enrolled patients with multiple sclerosis who did not respond to standard medical care to determine the benefit of combined immunosuppressive therapy with transplantation of a person's own stem cells. Five years after transplantation, 69 percent of participants had survived with no evidence of relapse, disability progression, or new brain lesions. Another NIAID-supported stem cell therapy showed promise in treating diffuse cutaneous systemic sclerosis, a fatal autoimmune disease in which the function of the skin, blood vessels, or internal organs is compromised by hardening of the tissues. Also in FY 2017, NIAID scientists identified new primary immune deficiency diseases (PIDDs), a group of rare but devastating chronic genetic disorders, and gained insights into their causes and possible treatments—in the process uncovering new details of normal immune function. Finally, building on years of research on food allergy, an NIAID-sponsored expert panel issued clinical guidelines to aid healthcare providers in the early introduction of peanut-containing foods to infants to prevent the development of peanut allergy.

This FY 2017 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. Through basic and applied research, the Institute will continue to advance the development of vaccines, therapeutics, and diagnostics that have proven in the past to improve health and save millions of 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 $4.9 billion in FY 2017. 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 2017 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 $4.9 billion in appropriated funds, an increase of $156 million over FY 2016's operating level.

■ NIAID distributed funds across the three mission areas: Biodefense and Emerging Infectious Diseases (BioD), 37.6 percent; HIV/AIDS, 34.1 percent; and Infectious and Immunologic Diseases (IID), 28.3 percent.

■ Approximately 80.8 percent of the total NIAID budget was awarded to the extramural research community. This includes 59.1 percent to Research Project Grants (RPGs), 18.3 percent to Research and Development (R&D) contracts, 0.8 percent to Research Centers, 1.4 percent to Other Research, and 1.2 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 $107 million over FY 2016, allowing the Institute to fund a total of 4,331 RPGs in FY 2017.

■ Approximately 21 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 19.1 percent, a rate higher than the overall NIH success rate of 18.7 percent.

■ NIAID supported 1,418 international projects in 119 countries, totaling approximately $564 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 Obligation History

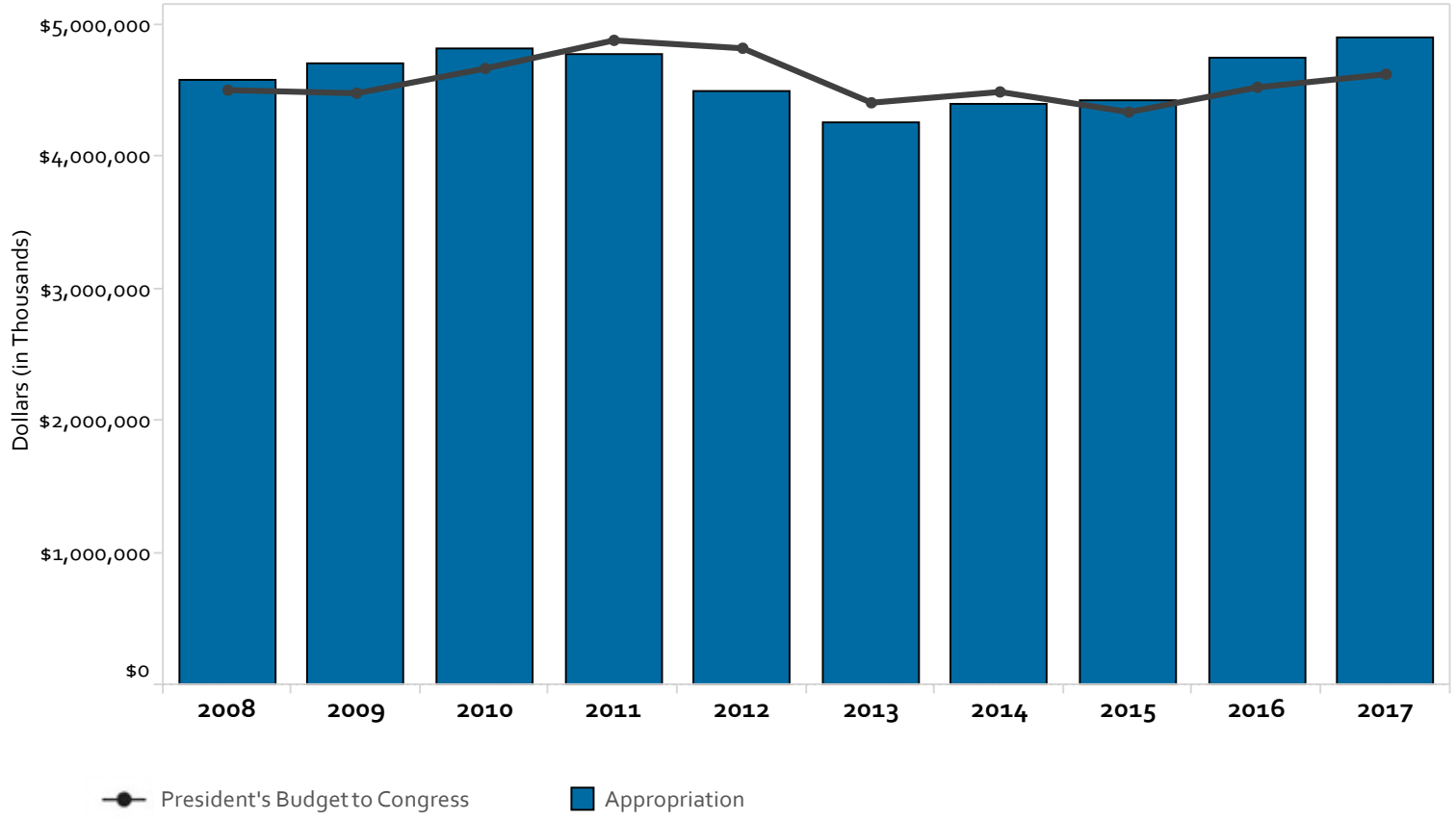
Funding (Dollars in Thousands)

Fiscal Year	President's Budget to Congress	Appropriation
2008	$4,592,482 [2]	$4,583,344[3]
2009	$4,568,778 [2]	$4,702,572[3]
2010	$4,760,295 [2]	$4,818,275 [3]
2011	$4,977,070 [2]	$4,775,968 [3]
2012	$4,915,970	$4,490,711
2013	$4,495,307	$4,256,327
2014	$4,578,813	$4,401,196
2015	$4,423,357	$4,417,558
2016	$4,614,779	$4,749,897[4]
2017	$4,715,697	$4,905,718

Excludes Recovery Act Funds (FY 2009 and 2010) and emergency Ebola funding of $238 million in FY 2015-FY 2016.
1 Appropriation is the "adjusted appropriation" as documented in the congressional Justification except where noted.
2 For the following fiscal years, the President's Budget to Congress includes Global Fund to Fight AIDS, Tuberculosis and Malaria transfers: FY 2007 = $100 million; FY 2008 = $300 million; FY 2009 = $300 million; FY 2010 = $300 million; FY 2011 = $297 million.
3 For the following fiscal years, the Appropriation includes Global Fund to Fight AIDS, Tuberculosis and Malaria transfers : FY 2007 = $99 million; FY 2008 = $295 million; Fy 2009 = $300 million; FY 2010= $300 million; FY 2011 = $297 million.
4 Includes Zika intra - NIH transfer: FY 2016 = $34.2 million.

NIAID Budget History

Funding (Dollars in Thousands)



2008-2011 includes pass-through funding for the Global Fund to Fight AIDS, Tuberculosis, and Malaria.

Funding for NIAID falls into three mission areas:

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

NIAID Actual Obligations by Mission Area

Funding (Dollars in Thousands)

	Mission Area			
Fiscal Year	BioD	HIV/AIDS	IID	Total [1]
2008[2]	$1,602,353	$1,497,722	$1,481,135	$4,581,210
2009[2]	$1,640,728	$1,541,074	$1,519,654	$4,701,456
2010 [2]	$1,679,215	$1,577,322	$1,559,518	$4,816,055
2011 [2]	$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	$1,610,560	$1,586,804	$1,220,165	$4,417,529
2016	$1,773,671[3]	$1,663,823	$1,312,389	$4,749,884
2017	$1,842,236	$1,673,531	$1,389,941	$4,905,708

Excludes Recovery Act Funds (FY2009 and 2010) and emergency Ebola funding of $238 million in FY 2015- FY 2016.

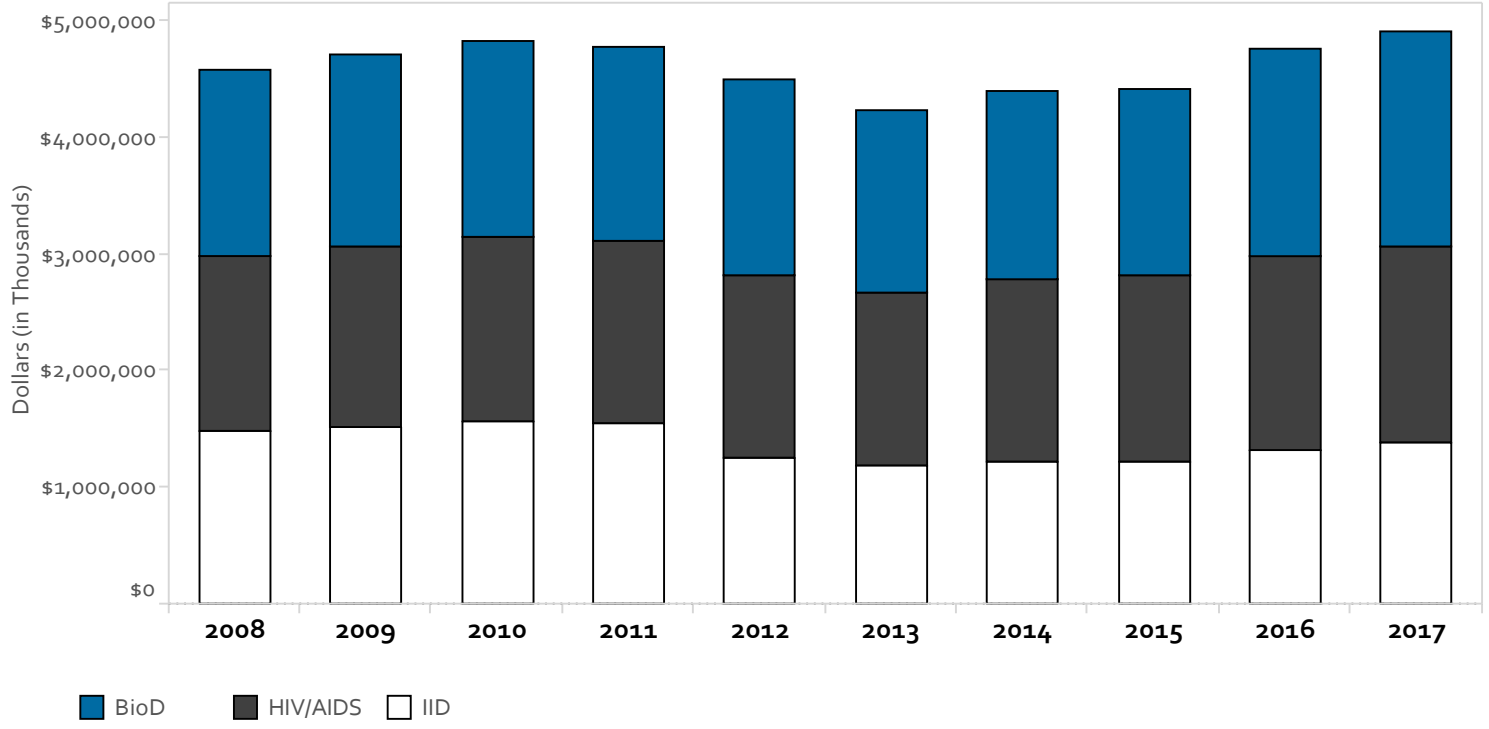
1 NIAID obligations shown above differ from Fiscal Year Appropriations due to mandated transfers documented in the congressional Justification.

2 Includes Global Fund to Fight AIDS, Tuberculosis and Malaria (FYs 2008, 2009, 2010, 2011)

3 Includes Zika intra-NIH transfer: FY2016 = $34.2 million.

NIAID Actual Obligations by Mission Area

Funding (Dollars in Thousands)



NIAID Funding by Budget Mechanism

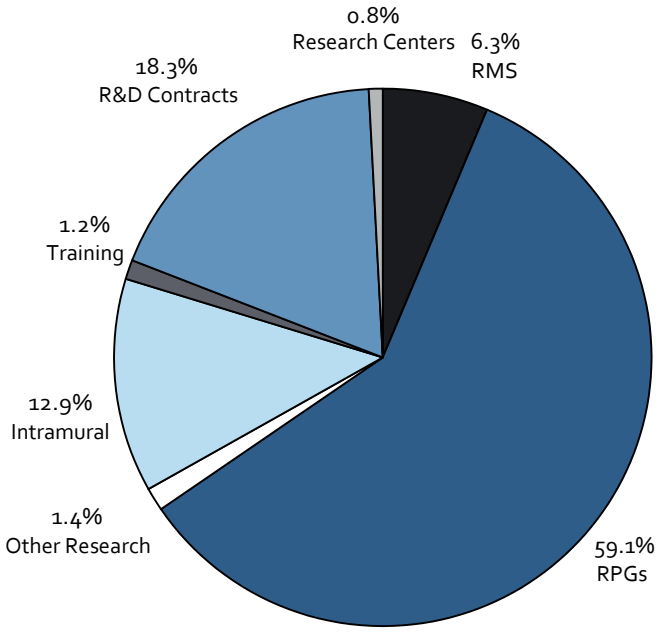
Funding (Dollars in Thousands)

	2015		2016		2017	
	Dollars	% of Total	Dollars	% of Total	Dollars	% of Total
Extramural Research Activities						
Research Project Grants (RPGs)						
Noncompeting	$1,897,799		$1,990,979		$2,171,367	
Competing	$577,371		$671,035		$584,150	
Subtotal, RPGs	**$2,475,170**		**$2,662,014**		**$2,755,516**	
SBIR/STTR [1]	$120,915		$131,713		$145,257	
Total Funding for RPGs	**$2,596,085**	**58.8%**	**$2,793,727**	**58.8%**	**$2,900,773**	**59.1%**
Research Centers	$36,453	0.8%	$37,995	0.8%	$40,328	0.8%
Other Research	$60,313	1.4%	$70,552	1.5%	$68,720	1.4%
Training	$54,809	1.2%	$57,124	1.2%	$57,097	1.2%
R&D Contracts	$854,744	19.3%	$870,998	18.3%	$897,339	18.3%
Subtotal, Extramural	**$3,602,404**	**81.5%**	**$3,830,396**	**80.6%**	**$3,964,257**	**80.8%**
Intramural	$527,037	11.9%	$619,929	13.1%	$630,641	12.9%
Research Management and Support (RMS)	$288,088	6.5%	$299,559	6.3%	$310,809	6.3%
NIAID Total	**$4,417,529**	**100.0%**	**$4,749,884**	**100.0%**	**$4,905,708**	**100.0%**

Reflects actual obligations.

1 SBIR/STTR programs are congressionally mandated.

NIAID Funding by Budget Mechanism: FY 2017



NIAID Research Project Grant Success Rate

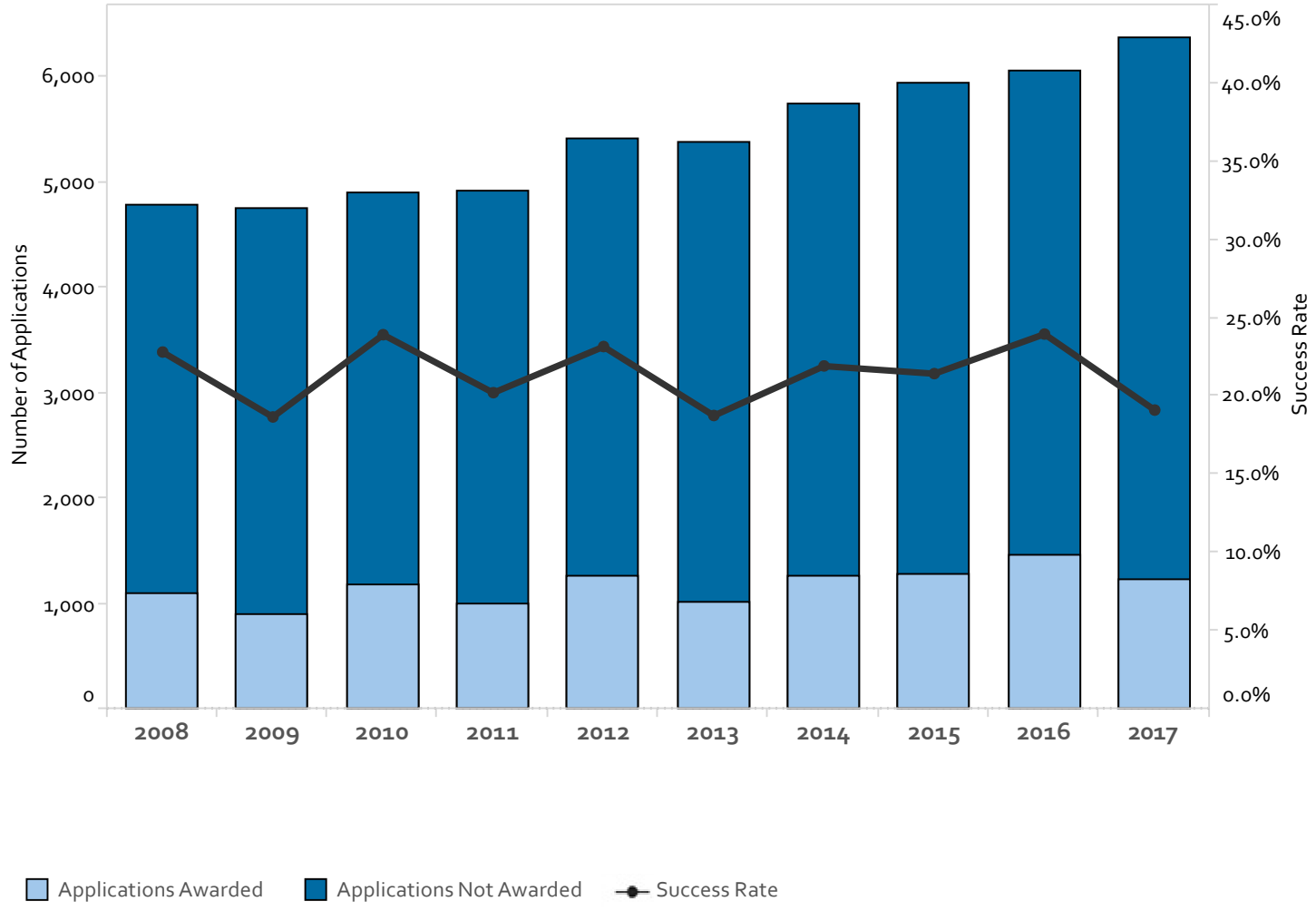
NIAID RPG Success Rate

Fiscal Year	Applications Awarded	Applications Reviewed	Success Rate
2008	1,090	4,776	22.8%
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%

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

Below is a table and histogram of the investigator-initiated R01 applications received in FY 2017 sorted by percentile score. The table and chart show applications received through the 65th 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.

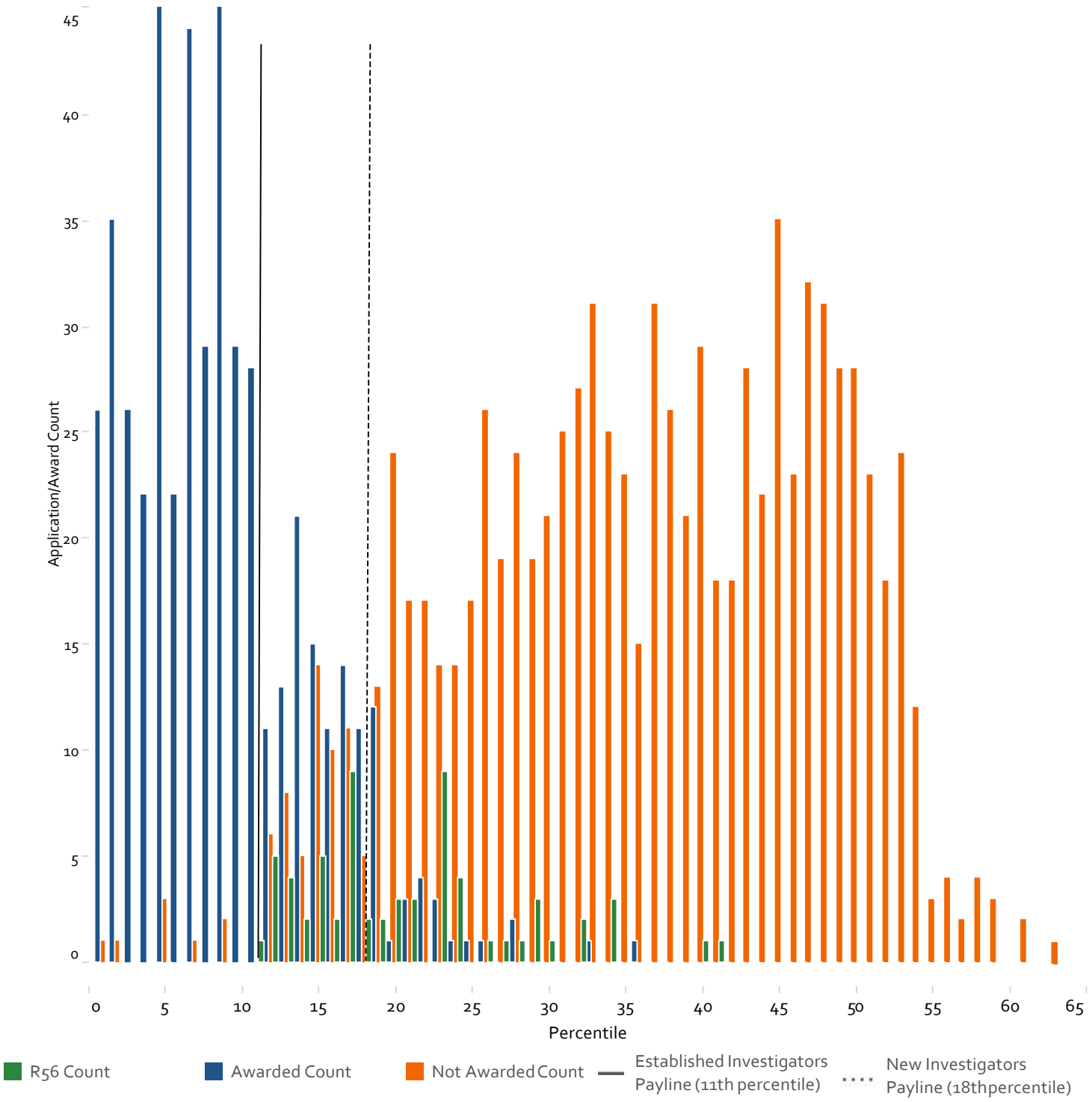
FY 2017 Applications/Awards Per Percentile: Unsolicited R01/R37/R56

Percentile	Awarded Count	Not Awarded	R56 Count
1	26	1	0
2	35	1	0
3	26	0	0
4	22	0	0
5	63	3	0
6	22	0	0
7	44	1	0
8	29	0	0
9	51	2	0
10	29	0	0
11	28	0	0
12	11	6	1
13	13	8	5
14	21	5	4
15	15	14	2
16	11	10	5
17	14	11	2
18	11	5	9
19	12	13	2
20	1	24	2
21	3	17	3
22	4	17	3
23	3	14	0
24	1	14	9
25	1	17	4
26	1	26	0
27	0	19	1
28	2	24	1
29	0	19	1
30	0	21	3
31	0	25	1
32	0	27	0
33	1	31	2
34	0	25	0
35	1	23	3

Percentile	Awarded Count	Not Awarded	R56 Count
36	1	15	0
37	0	31	0
38	0	26	0
39	0	21	0
40	0	29	0
41	0	18	1
42	0	18	1
43	0	28	0
44	0	22	0
45	0	35	0
46	0	23	0
47	0	32	0
48	0	31	0
49	0	28	0
50	0	28	0
51	0	23	0
52	0	18	0
53	0	24	0
54	0	12	0
55	0	3	0
56	0	4	0
57	0	2	0
58	0	4	0
59	0	3	0
60	0	0	0
61	0	2	0
62	0	0	0
63	0	1	0
64	0	0	0
65	0	0	0
66	0	1	0
67	0	0	0
68	0	0	0
69	0	0	0
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	0	0
75	0	0	0
76	0	0	0
77	0	0	0
78	0	0	0
79	0	0	0
80	0	0	0
81	0	0	0

Percentile	Awarded Count	Not Awarded	R56 Count
82	0	0	0
83	0	0	0
84	0	0	0
85	0	0	0
86	0	0	0
87	0	0	0
88	0	0	0
89	0	0	0
90	0	0	0
91	0	0	0
92	0	0	0
93	0	0	0
94	0	0	0
95	0	0	0
96	0	0	0
97	0	0	0
98	0	0	0
99	0	0	0

FY 2017 Applications/Awards Per Percentile: Unsolicited R01/R37/R56



NIAID-Supported National Research Service Awards

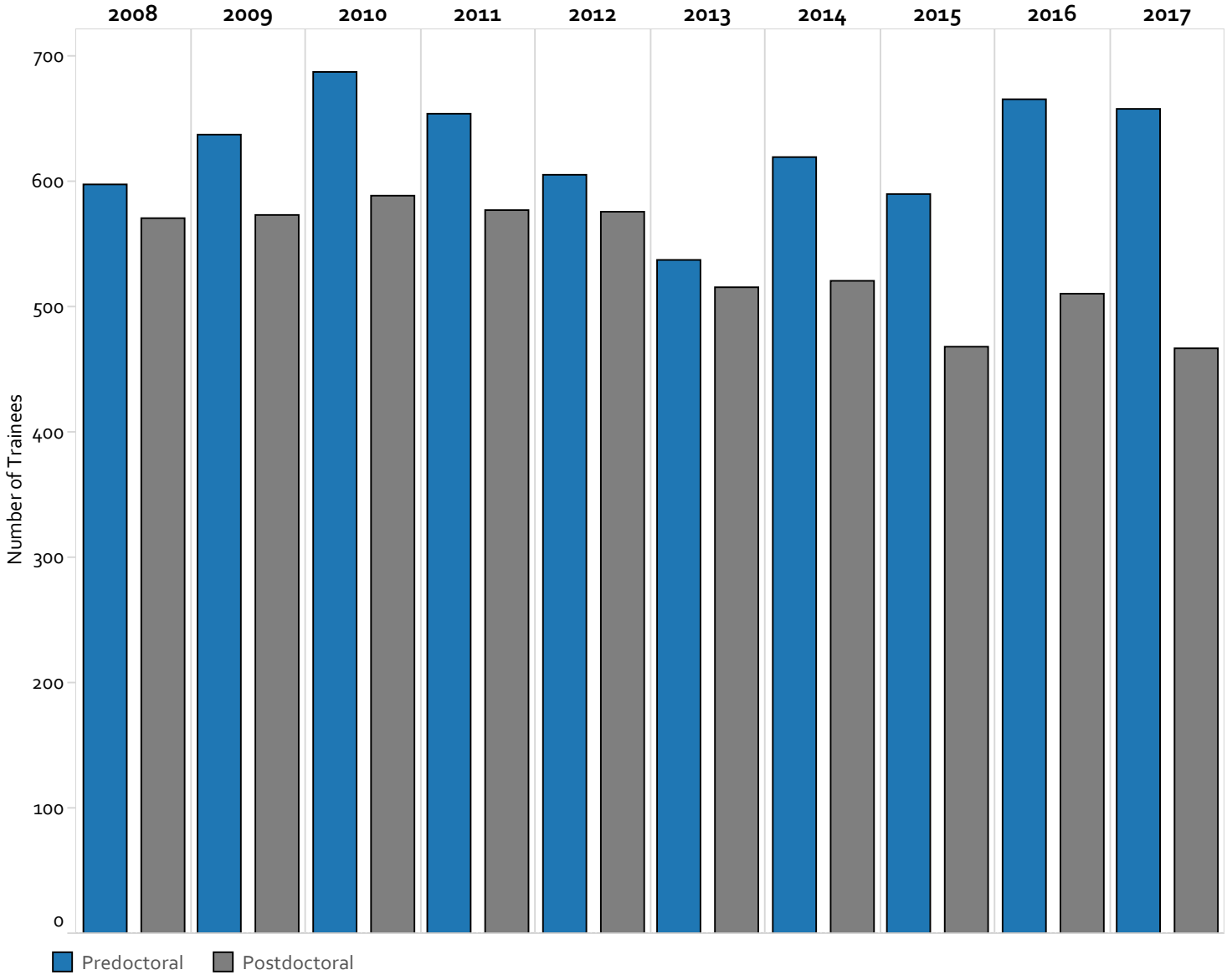
The Ruth L. Kirschstein National Research Service Award (NRSA) supports the training of biomedical, behavioral, and clinical researchers through individual pre and postdoctoral fellowships, and institutional research training grants.

NIAID-Supported National Research Service Awards by Fiscal Year

Trainee	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Postdoctoral	571	573	589	577	576	516	521	468	511	467
Predoctoral	598	637	687	654	605	537	619	590	666	658
Total	1,169	1,210	1,276	1,231	1,181	1,053	1,140	1,058	1,177	1,125

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

NIAID-Supported National Research Service Awards by Fiscal Year

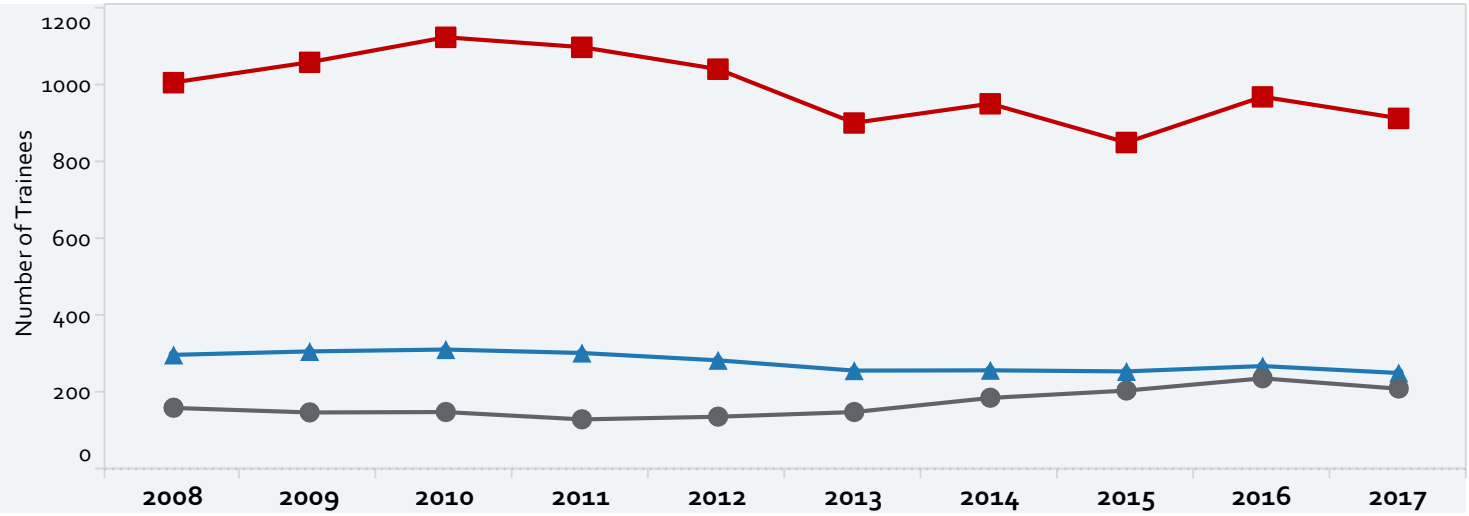


NIAID Training and Career Development Awards by Mechanism: Funding (Dollars in Thousands)

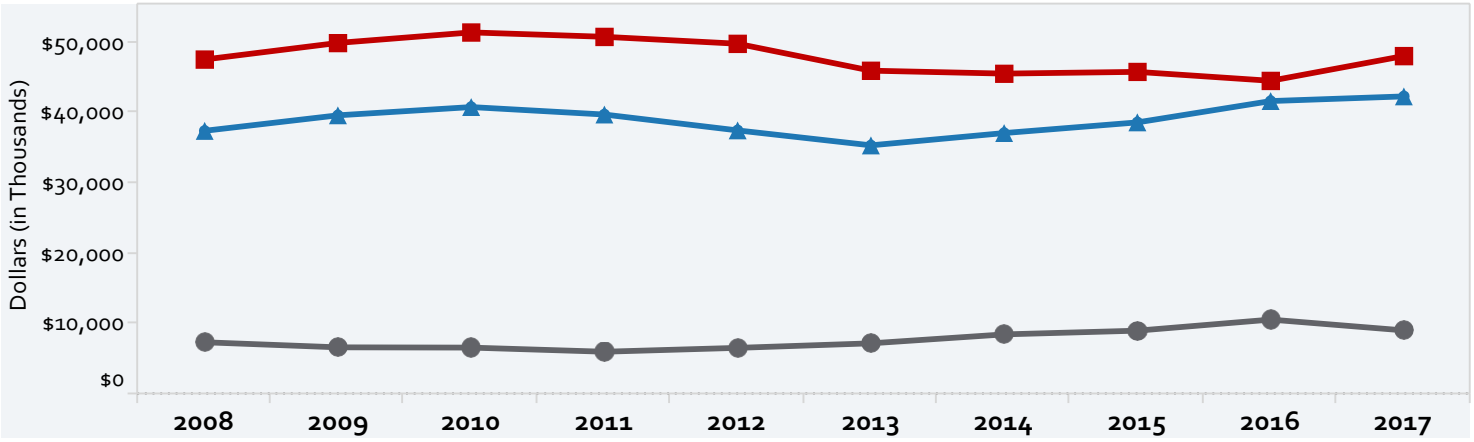
Fiscal Year	F Awards		K Awards		T Awards	
	Training Positions Awards	Dollars	Training Positions Awards	Dollars	Training Positions Awards	Dollars
2008	161	$7,395	299	$37,388	1,008	$47,523
2009	149	$6,674	308	$39,587	1,061	$49,857
2010	150	$6,635	313	$40,763	1,126	$51,365
2011	131	$6,059	304	$39,707	1,100	$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	258	$38,594	883	$45,768
2016	238	$10,608	270	$41,613	971	$44,485
2017	215	$9,081	260	$42,278	0	$48,016

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

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



NIAID Training and Career Development Awards by Mechanism: Funding



T Awards K Awards F Awards

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

Pathogens, Diseases and Conditions	
Allergic Rhinitis (Hay Fever)*	$4,168
Anthrax*	$42,966
Arthritis*	$18,681
Asthma*	$84,351
Autoimmune Disease*	$212,252
Cholera	$17,684
Dengue	$54,687
Diabetes*	$28,909
Digestive Diseases*	$397,560
Ebola**	$101,411
Emerging Infectious Diseases*	$2,073,992
Food Allergies*	$71,079
Fungal diseases	$80,107
Hepatitis - C*	$42,012
Hepatitis*	$141,553
HIV/AIDS*	$1,673,531
Infectious Diseases*	$3,553,005
Inflammatory Bowel Disease*	$27,006
Influenza*	$255,745
Lupus*	$40,755
Lyme Disease*	$19,658
Malaria*	$157,299
Multiple Sclerosis*	$32,895
Parasitic diseases	$331,490
Pediatric AIDS*	$52,627
Pediatric Research*	$356,424
Pneumonia & Influenza*	$319,520
Primary Immune Deficiency Diseases	$50,148
Sexually Transmitted Diseases/Herpes*	$139,808
Staphylococcus aureus	$32,042
Tropical medicine	$612,569
Tuberculosis*	$299,060
Vector-Borne Diseases*	$454,041

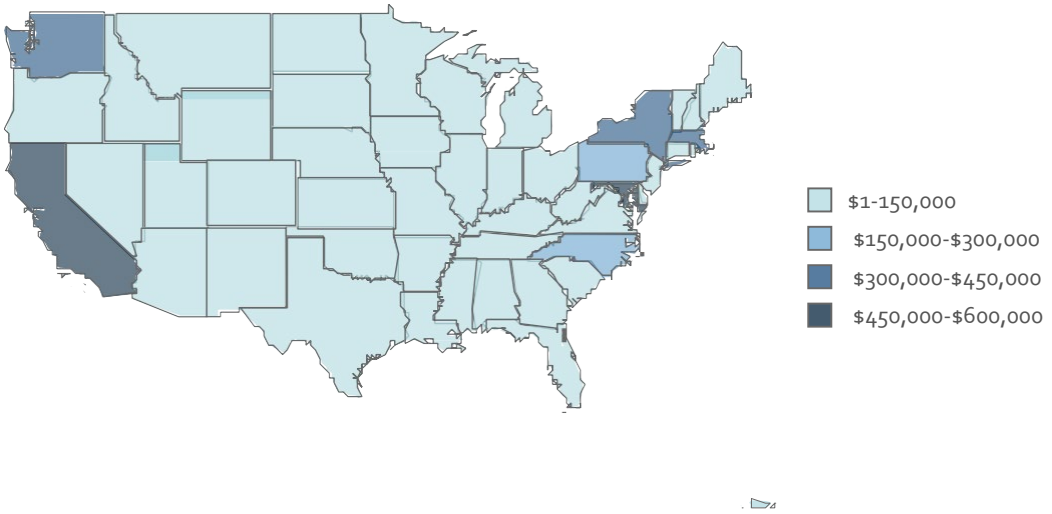
Other Research	
Antimicrobial Resistance*	$380,909
Biodefense*	$1,842,236
Chemical Countermeasures Research**	$47,453
Immune Tolerance	$214,534
Prevention*	$1,924,311
Radiological/Nuclear Research**	$45,939
Stem Cell Research*	$80,566
Topical Microbicides*	$82,985
Transplantation*	$170,851
Vaccine Related (AIDS)*	$509,162

* 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

Funding by U.S. States and Territories: FY 2017

Funding (Dollars in Thousands)

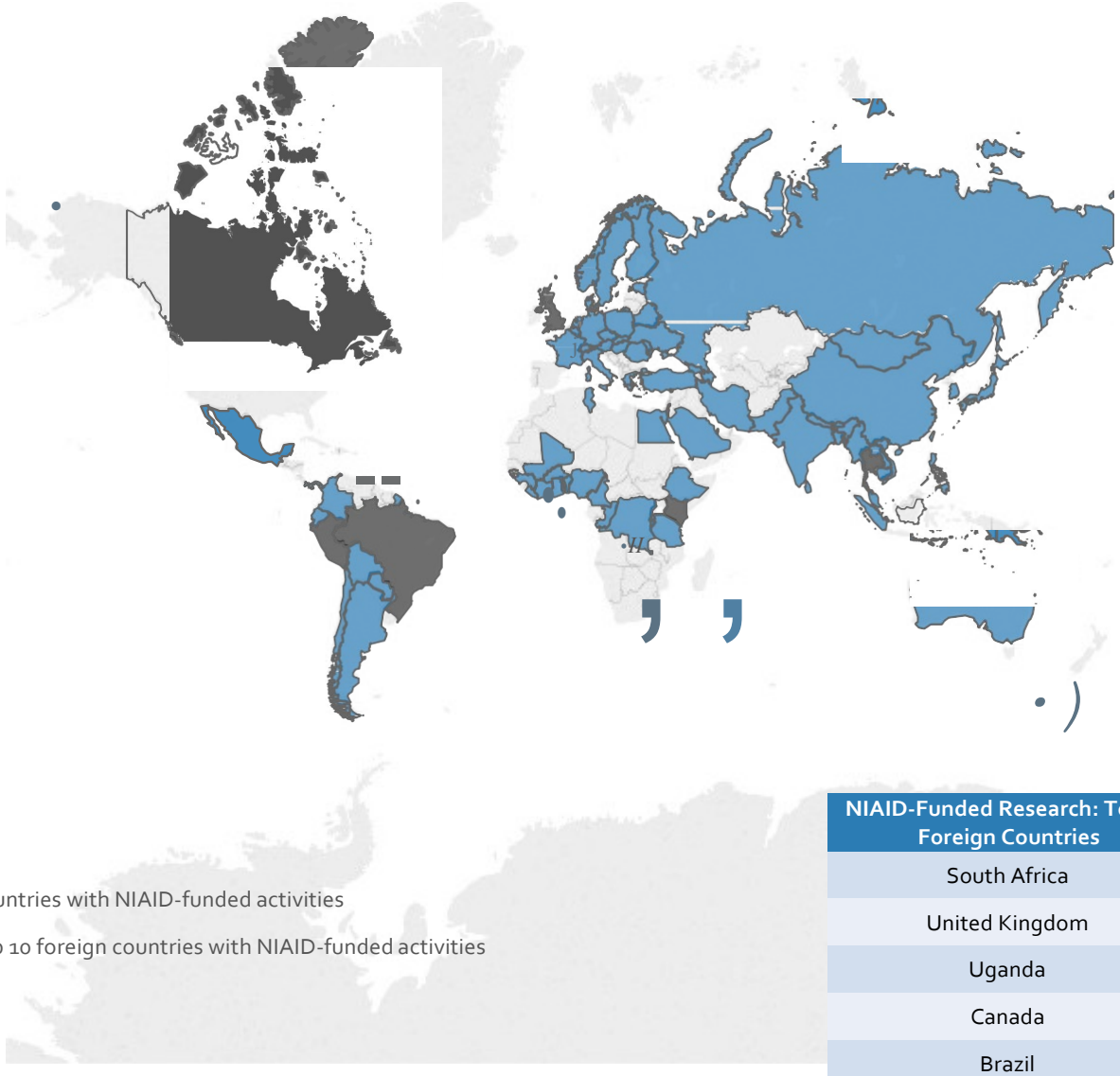


State	
Alabama	$57,137
Alaska	$367
Arizona	$15,835
Arkansas	$3,002
California	$522,099
Colorado	$52,649
Connecticut	$57,950
Delaware	$534
District of Columbia	$63,622
Florida	$62,327
Georgia	$120,887
Hawaii	$6,428
Idaho	$0
Illinois	$104,267
Indiana	$35,362
Iowa	$21,197
Kansas	$9,711
Kentucky	$16,704
Louisiana	$31,573
Maine	$2,013
Maryland	$560,185
Massachusetts	$440,885
Michigan	$63,906
Minnesota	$38,698
Mississippi	$1,986
Missouri	$73,719

State	
Montana	$6,529
Nebraska	$11,439
Nevada	$3,536
New Hampshire	$13,617
New Jersey	$39,478
New Mexico	$11,395
New York	$306,175
North Carolina	$285,546
North Dakota	$1,325
Ohio	$86,983
Oklahoma	$9,676
Oregon	$33,028
Pennsylvania	$233,819
Puerto Rico	$2,815
Rhode Island	$11,047
South Carolina	$11,076
South Dakota	$1,858
Tennessee	$79,544
Texas	$145,525
Utah	$20,866
Vermont	$3,184
Virginia	$74,366
Washington	$320,655
West Virginia	$323
Wisconsin	$58,256
Wyoming	$458
Grand Total	**$4,135,560**

Global Health Research at NIAID: FY 2017

Funding (Dollars in Thousands)



NIAID-Funded Research: Top 10 Foreign Countries
South Africa
United Kingdom
Uganda
Canada
Brazil
Kenya
Malawi
Peru
Thailand
Zimbabwe

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