

# Funding agencies and grant mechanisms

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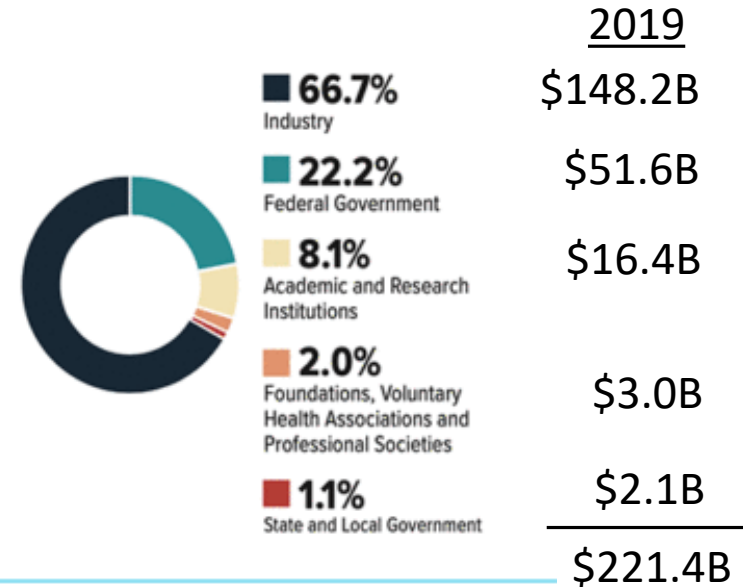
I have no financial or non-financial relationships to declare for this presentation

# US expenditures in medical and health R&D

R&D investment as a percentage of overall US health spending (2018)

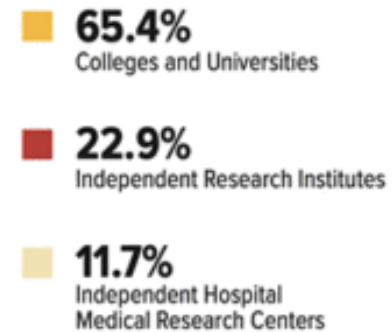


Total 2018 Health Spending:  
**\$3.8 trillion**



US medical and health R&D expenditures by funding source (2018)

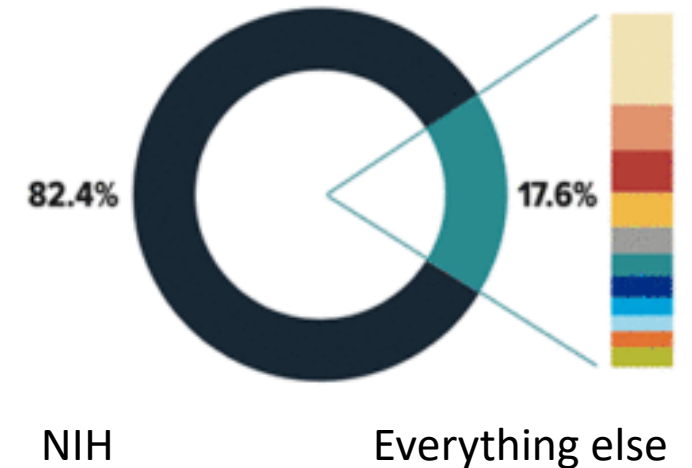
# Academic and research institution investment in medical and health R&D



\$16B in 2019

# Federal medical & health R&D expenditures

	<u>2019 (\$, millions)</u>
National Institutes of Health (NIH)	43,263
Department of Defense (DOD)	2,184
Department of Veteran Affairs (VA)	1,407
National Science Foundation (NSF)	824
Centers for Medicare & Medicaid Services	808
Biomedical Advanced Research and Development Authority (BARDA)	562
Food and Drug Administration	493
Agency for Healthcare Research & Quality (AHRQ)	454
Centers for Disease Control & Preventions (CDC)	419
Patient-centered Outcomes Research Institute	390
Department of Energy (DOE)	368
Agency for Healthcare Research and Quality (AHRQ)	454
NASA	145
Environmental Protection Agency (EPA)	114
Department of Commerce	38
US Agency for International Development (USAID)	37
Other HHS	37
Health Resources and Services Administration (HRSA)	33
	<u>33</u>
	\$51.6 B



# National Institutes of Health (NIH)

- NIH Building One (1938)
- Dedicated in 1940 by President Franklin Roosevelt
- Now called the James H. Shannon building
- Houses the Office of the Director and other NIH admin offices

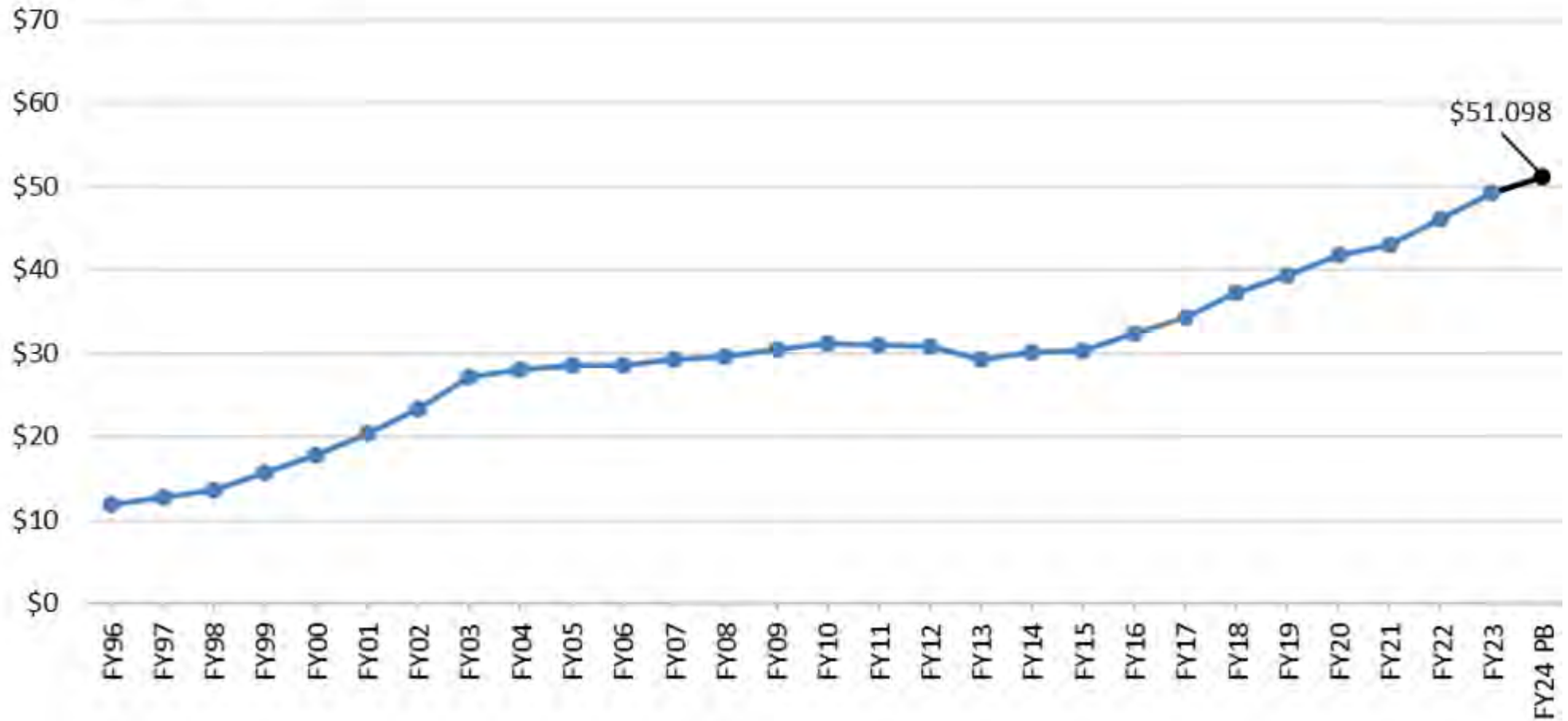


Picture credit- NIH

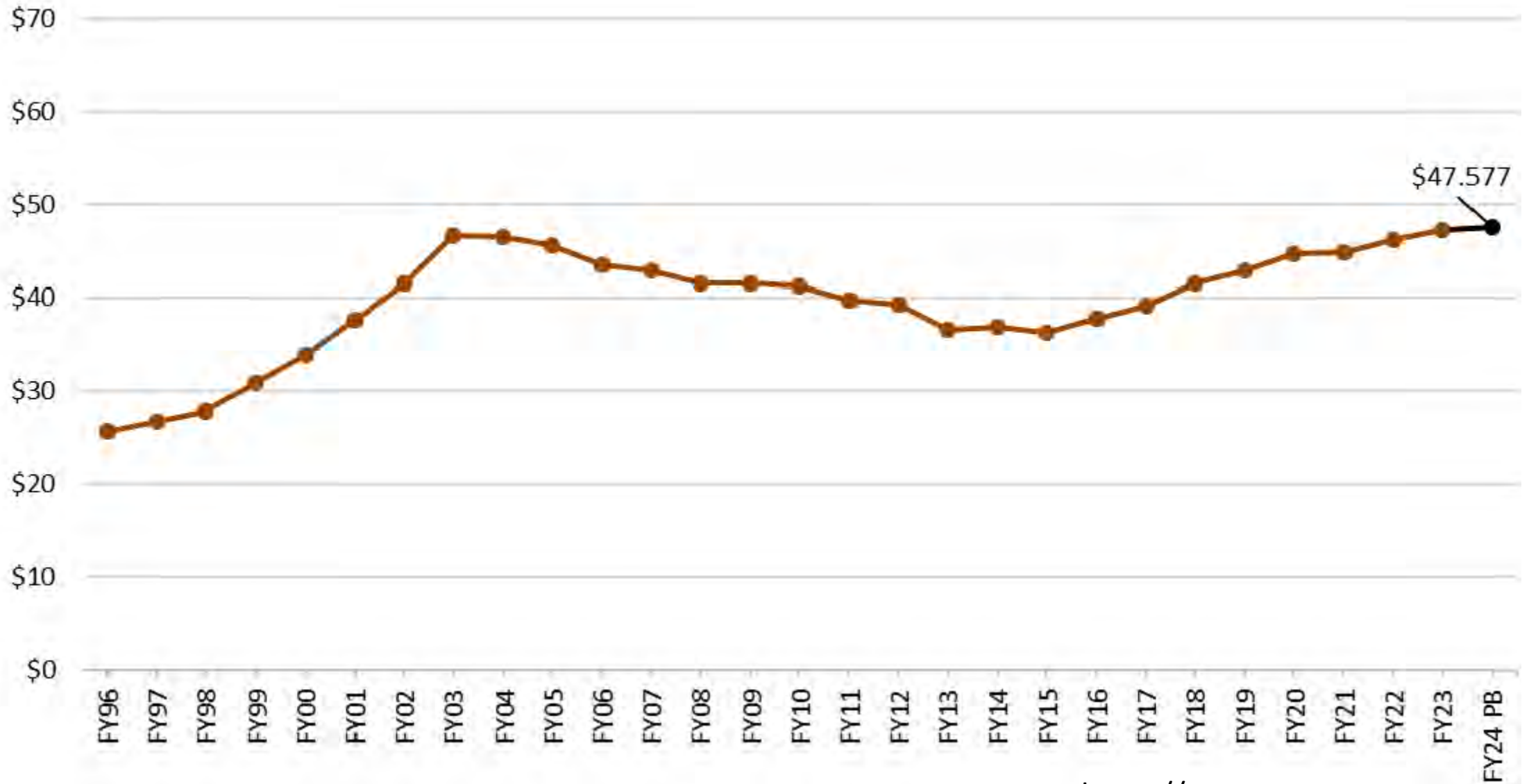
The NIH accounts for 82% of federal investment in health and medicine research  
~\$50 billion per year currently

# NIH funding 1996-2023 (\$, billions)

Current Dollars (billions)



# NIH funding 1996-2023 (\$, inflation adjusted billions)





# NIH: 27 Institutes & Centers (ICs)

## Institutes

- National Cancer Institute (NCI)
- National Eye Institute (NEI)
- National Heart, Lung, and Blood Institute (NHLBI)
- National Human Genome Research Institute (NHGRI)
- National Institute on Aging (NIA)
- National Institute on Alcohol Abuse and Alcoholism (NIAAA)
- National Institute of Allergy and Infectious Diseases (NIAID)
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
- National Institute of Biomedical Imaging and Bioengineering (NIBIB)
- National Institute of Child Health and Human Development (NICHD)
- National Institute on Deafness and Other Communication Disorders (NIDCD)
- National Institute of Dental and Craniofacial Research (NIDCR)
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
- National Institute on Drug Abuse (NIDA)
- National Institute of Environmental Health Sciences (NIEHS)
- National Institute of General Medical Sciences (NIGMS)
- National Institute of Mental Health (NIMH)
- National Institute on Minority Health and Health Disparities (NIMHD)
- National Institute of Neurological Disorders and Stroke (NINDS)
- National Institute of Nursing Research (NINR)
- National Library of Medicine (NLM)

## Centers

- Fogarty International Center (FIC)
- National Center for Complementary and Integrative Health (NCCIH)
- Office of the Director

# NIH paylines (2019)

Institute	Funding Mechanism	Payline/OIS
<a href="#">NIAID</a>	R01 (new PI)	16%
	R01 (non-new PI)	12%
	R03	28 OIS
	R21	28 OIS
<a href="#">NCI</a>	R01 (new PI)	14%
	R01 (non-new PI)	8%
	R03	25 OIS
	R21	7%
<a href="#">NHLBI</a>	R01 (new PI)	26%
	R01 (non-new PI)	16%
	R03/R21	N/A
<a href="#">NIA*</a>	R01 (new PI/ESI)	23/25%
	R01 (non-new PI)	16%
	R03/R21	25%
<a href="#">NIGMS</a>	No payline published per funding policies	
<a href="#">NIDDK<sup>+</sup></a>	R01 (new PI)	18%
	R01 (non-new PI)	13%
<a href="#">NIEHS</a>	No payline published per funding strategies	
<a href="#">NIDA</a>	No payline published per funding strategy	
<a href="#">NICHD</a>	No payline published per funding strategies	

OIS=Overall Impact Score

# NIH grant funding mechanisms

- R**      **Research Project grants**
- P**      **Research Program Project grants**
- T**      **Training programs**
- F**      **Fellowships programs**
- K**      **Research career awards**
- S**      **Research-related programs (e.g. S10)**
- U**      **Cooperative agreements**

# R grant awards

<b>R01</b>	<b>Research Project Grants</b>
<b>R21</b>	<b>Exploratory/Developmental Research Grants</b>
<b>R03</b>	<b>Small Grant Program</b>
<b>R35</b>	<b>Outstanding Investigator Awards</b>
<b>R43/R44</b>	<b>Small Business Innovation Research (SBIR) Program</b>
<b>R41/R42</b>	<b>Small Business Technology Transfer (STTR) Program</b>
<b>R13</b>	<b>Conference and scientific meeting grants</b>
<b>[R15</b>	<b>Research enhancement award (AREA/REAP) – open only to eligible institutions]</b>

# R01

- Oldest grant mechanism used by the NIH
- Investigator-initiated or solicited by a *Request for Applications (RFA)*
- Bread and butter award for many investigators
- “supports a discrete, specified, circumscribed project to be performed by the named investigator(s) in an area representing the investigator's specific interest and competencies”
- Preliminary data expected
- 4-5 years
- Up to \$500K directs per year can be requested
- Can be renewed
- Standard NIH deadlines

# R21

- **Distinct from R01**
- **Designed to encourage exploratory/developmental research by providing support for the early and conceptual stages of project development - “high risk/high reward”**
- **Expected to lead to something bigger**
- **Preliminary data are not required, but can be included if available**
- **Up to 2 years**
- **Not renewable**
- **Total direct for 2 years is \$275K (e.g. \$150K, year 1 and \$125K, year 2)**
- **Not offered by all NIH institutes (not NCI, NCATS, NHLBI, NIDDK, NIGMS, NINDS, except where part of a specific PA)**
- **Standard receipt dates are February 16, June 16, and October 16.**

*Not easier to get than R01s*

# R03

- **Small-scale funding for projects with limited scope:**
  - **Pilot or feasibility studies**
  - **Secondary analysis of existing data**
  - **Small, self-contained projects**
  - **Development of new research methodology or tools**
- **Preliminary data not required**
- **Total directs are \$50K/year**
- **Not renewable**
- **Not offered by all NIH institutes** (not NCATS, NCCAM, NCI, NEI, NHLBI, NIAMS, NIDCD, NIDCR, NIDDK, NIGMS, NINR or NLM, except where part of a specific PA)
- **Same deadline as R21s**

*Not easier to get than R01s*

# R35

- Provides longer-term support to outstanding investigators
- Flexible funding, not tied to specific aims
- Idea is to free up time for research rather than writing applications
- ICs have their own mechanisms
- 5-year awards (NIGMS), 7 years (NCI), up to 8 years (NINDS)
- May have to relinquish other funding, if awarded
- Budgets vary by IC, e.g. \$250K directs for new investigators (NIGMS), \$600K directs (NCI)



# Big awards

## P01 (aka PPG)

- Multiple complementary individual projects
- In essence, several R01-level projects in one package – sharing knowledge and common resources
- Often multidisciplinary
- Provides support for cores, including administrative core
- >\$500K (depending on IC)

## U01

- Similar to P01 but NIH staff are programmatically involved

## P30

- Center core grants

# **K99/R00: Pathway to Independence Award**

- **Assists transition from mentored postdoc to independent faculty investigators**
- **Offered by most ICs**
- **Must have <4 years postdoc experience at time of submission**
- **Must be US citizen or permanent resident**
- **Mentored K99 phase is 2 years**
- **R00 phase is up to 3 years – granted upon satisfactory progress in K99 phase and on obtaining faculty position**
- **Must commit minimum 75% time to research (50% for surgical specialties)**
- **Need mentor and advisory committee**
- **Max. \$100K/year for K99 phase**
- **Max. \$250K/year directs for R00 phase**
- **Have to submit a transition application for R00 phase**

***Not just about the science – must have meaningful plan for mentored career development***

# Other K's

## **K08 Mentored Clinical Scientist Research Career Development award**

- Targeted to junior clinicians wishing to engage in research
- Provides support and protected time for an intensive, supervised research career development experience in the fields of biomedical, behavioral, or clinical research, including translational research
- 3-5 year awards
- \$100K/year for salary plus \$25K research support
- Must be US citizen or permanent resident
- Must commit at least 75% time

## **K01 Mentored Research Scientist Research Career Development award**

- Essentially same as K08 but not restricted to clinical investigators
- Used by some ICs to enhance workforce diversity

## **K02 Independent Research Scientist Research Development award**

- For early-to-mid career scientists with research who need additional protected time to increase potential

<https://researchtraining.nih.gov/programs/career-development>

# Training Grants and Fellowship awards

## **T32 Institutional Research Training Grant**

- Provides stipends and tuition for graduate students or postdocs within a training program
- Renewable, 5-year awards
- Supports only US citizens or permanent residents
- Typically led by established, recognized scientist (Professor level)

## **F awards: Ruth L. Kirschstein National Research Service Awards (NRSAs)**

Individual awards to students and scientists at various stages of career

**F30 - MD/PhD dual degree trainees (6 years)**

**F31 – Predoctoral training fellowship (*i.e.* PhD-seeking graduate students)(3 years – varies by IC, though)**

**F31 Diversity - (5 years)**

**F32 – Postdoctoral fellowship (3 years)**

**F33 – Senior fellows (changing direction of research careers)**

<https://researchtraining.nih.gov/programs/career-development>

# S10 Shared Instrumentation awards

- **Supports purchase of major instrumentation that serves multiple groups**
- **Examples:** X-ray diffractometers, mass spectrometers, nuclear magnetic resonance (NMR) spectrometers, DNA and protein sequencers, biosensors, electron and light microscopes, cell sorters, and biomedical imagers.
- **Two flavours:**
  - **Shared instrumentation award (SIG) - \$50,000 - \$600,000 range**
  - **High-end instrumentation (HEI) - >\$600,000**
- **Minimum of 3 NIH-funded investigators as Major Users**
- **Plus ~4-8 minor users**
- **75% of the AUT should be supported by existing NIH awards**
- **Institutional Commitment is an important factor**
- **Operational plan also important**
- **One deadline per year – June 1st**



# National Science Foundation

- FY22 budget was \$8.8 billion, included \$7.0 billion for research

## NSF Directorates

- **Biological Sciences (BIO) - \$831 million**
- **Computer and Information Science and Engineering (CISE)**
- **Engineering (ENG) - \$775 million**
- **Geosciences (GEO)**
- **integrative Activities (OIA)**
- **International Science and Engineering (OISE)**
- **Mathematics and Physical Sciences**
- **Social, Behavioral and Economic Sciences (SBE) - \$286 million**
- **STEM Education (EDU)**
- **Technology, Innovation and Partnerships (TIP)**

<https://new.nsf.gov/about/budget/fy2023/appropriations>



## Biological Sciences Directorate

- **Biological Infrastructure (DBI)**
- **Environmental Biology (DEB)**
- **Emerging Frontiers (EF)**
- **Integrative Organismal Systems (IOS)**
- **Molecular and Cellular Biosciences (MCB)**

“**NSF** does not fund research for which the goals are directly human disease- or health-related, including the etiology, diagnosis, and/or treatment of disease or disorder is not eligible for support”.

The NSF is very big on **broader impacts** of the research in addition to Intellectual Merit, i.e., societal or educational benefit (including URM)



# Getting Started

## 🏠 Funding at NSF

### Finding Funding

#### Getting Started

[Search for Funding](#)

[Search Funded Projects \(Awards\)](#)

[For Early-Career Researchers](#)

[For Postdoctoral Researchers](#)

[For Graduate Students](#)

[For Undergraduates](#)

[For Entrepreneurs](#)

[For Industry](#)

[NSF Initiatives](#)

[Preparing Your Proposal](#) +

[Submitting Your Proposal](#)

[How We Make Funding Decisions](#)

– The U.S. National Science Foundation offers hundreds of funding opportunities — including grants, cooperative agreements and fellowships — that support research and education across science and engineering.

[Search for funding](#)

[Search funded projects \(awards\)](#)

### 📄 On this page

- [What we fund](#)
- [How we announce funding opportunities](#)
- [How to find the right funding opportunity](#)
- [How to contact us](#)
- [Frequently asked questions](#)



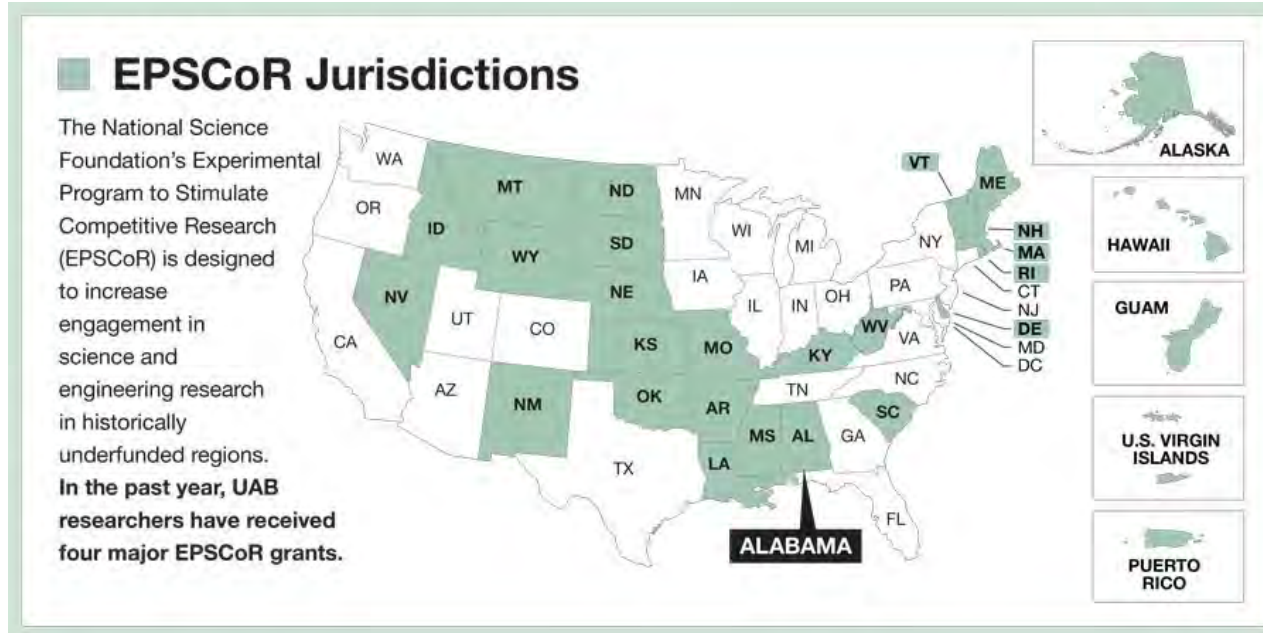


## Opportunities for Early-Career Researchers

- Building Research Capacity of New Faculty in Biology (BRC-BIO)
- Faculty Early Career Development Program (CAREER)
- Career-Life Balance Supplemental Funding Requests
- Computer and Information Science and Engineering Research Initiation Initiative (CRII)
- EARly-Concept Grants for Exploratory Research (EAGER)
- Building Capacity in STEM Education Research (ECR: BCSER)
- Engineering Research Initiation (ERI)
- Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences (LEAPS-MPS)
- RII Track-4: EPSCoR Research Fellows



# EPSCoR (Established Program to Stimulate Competitive Research)



- Intended to enhance the research competitiveness of targeting jurisdictions by strengthening STEM capacity and capability.
- Offered by NSF, DOE, Dept. of Agriculture and NASA
- Similar in principle to the NIH's IDeA (Institutional Development Award)
- EPSCoR Research Infrastructure Improvement Program (RII) - several tracks:
  - Track-1 – Statewide awards. Up to \$4M/year for 5 years. One per EPSCoR jurisdiction
  - Track-2 – Focused EPSCoR Collaborations (FEC). Up to \$1M/year for collabs between 2 jurisdictions or 1.5M/year for 3 or more collabs.
  - Track-3 – To broaden participation in research. Up to \$750K/year for up to 5 years
  - Track-4 – Research Fellowships – individual faculty

<https://new.nsf.gov/funding/initiatives/epscor/epscor-investment-strategies>



## Major Research Instrumentation Program

- Supports purchase of major multi-user instrumentation or development of new instrumentation
- \$75M available for ~100 awards per year
- More tracks!
  - Track 1: \$100,000 - \$1,400,000 (*2 per institution*)
  - Track 2: \$1.4 – 4M (*1 per institution*)
  - Track 3: \$100,000 - \$1,400,000 to reduce consumption of helium (*1 per institution*)
- Cost-sharing requirement waived for 5 years

# Department of Defense (DOD)

- The DOD awards funds from Congressionally Directed Medical Research Programs (CDMRP) for projects that focus on advancements in military medicine and public health benefits
- DOD comprises 4.7% of federal investment in medical and health R&D (2018)
- FY21, DOD's Defense Health Program was \$2.4 billion – \$1.5 billion for CDMRP
- CDMRP appropriation is separate from DOD budget
- Emphasis on high risk, high impact projects
- 1,190 research awards in FY21
- Since 2012, DOD has coordinated with the NIH and the VA to avoid duplication

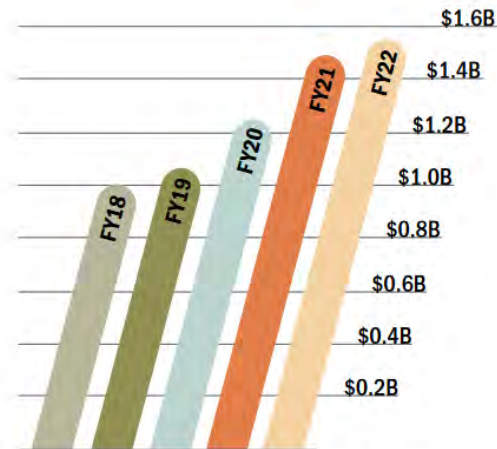


Figure 1. FY18-FY22 CDMRP Congressional Appropriations

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- Multiple Sclerosis

- Alcohol and Substance Use Disorders
- Amyotrophic Lateral Sclerosis
- Autism
- Bone Marrow Failure
- Breast Cancer
- Chronic Pain Management
- Combat Readiness-Medical
- Duchenne Muscular Dystrophy
- Epilepsy
- Gulf War Illness
- Hearing Restoration
- Joint Warfighter Medical
- Kidney Cancer
- Lung Cancer
- Lupus
- Melanoma
- Military Burn
- Multiple Sclerosis
- Neurofibromatosis
- Neurotoxin Exposure Treatment Parkinson's
- Orthotics and Prosthetics Outcomes
- Ovarian Cancer
- Pancreatic Cancer
- Parkinson's
- Peer Reviewed Alzheimer's

- Peer Reviewed Cancer
- Peer Reviewed Medical
- Peer Reviewed Orthopaedic
- Prostate Cancer
- Rare Cancers
- Reconstructive Transplant Research
- Scleroderma
- Spinal Cord Injury
- Tick-Borne Disease
- Toxic Exposures
- Traumatic Brain Injury and Psychological Health
- Tuberous Sclerosis Complex
- Vision

### Additional Supported DOD Programs/Projects

- Defense Medical Research and Development
  - Medical Simulation and Information Sciences Research Program (JPC-1)
  - Military Infectious Diseases Research Program (JPC-2)
  - Military Operational Medicine Research Program (JPC-5)
  - Combat Casualty Care Research Program (JPC-6)
  - Radiation Health Effects Research Program (JPC-7)
  - Clinical and Rehabilitative Medicine Research Program (JPC-8)
- Psychological Health/Traumatic Brain Injury
- Previously Funded Research Programs

) encompassing  
approximately over \$7.7  
423 awards have

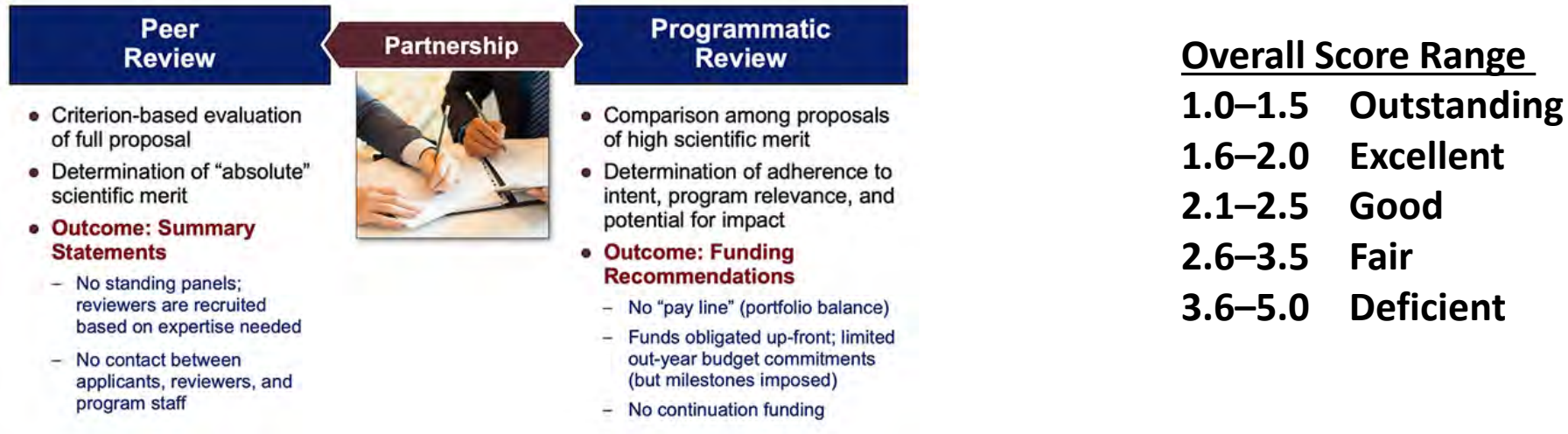
36 research programs

Appropriations to individual programs varies year-to-year

# DOD application process

- Program Announcement/Broad Agency Announcement (PA/BAA)
- Submit pre-application (LOI or pre-proposal) in Electronic Biomedical Research Application Portal (eBRAP)
- If pre-application was a pre-proposal, you must be invited before sending full proposal

## Two-Tier Review Process



<https://cdmrp.health.mil/about/2tierRevProcess>



# Foundations

*Only < 3% of all US funding for R&D but can be impactful  
e.g. support for rare diseases, high-risk science*

- **American Cancer Society** – Currently, \$446 million support for 684 active grants (\$8.2 million to Alabama, none to USA) – 4-year awards, \$200-800K range
- **American Heart Association** - Currently, \$479 million support for 1,700 projects (Reese Stevens & Grant Daly; Undergraduate Summer Research, Tom Rich; Career Dev, Ji-Young Lee )
- **Bill & Melinda Gates Foundation** – enhance healthcare and reduce extreme poverty across the world, and to expand educational opportunities and access to information technology in the U.S (\$67B endowment as of 2022; \$7B in grants)
- **Robert Wood Johnson Foundation** – health equity (~\$50K-2M awards)
- **Cystic Fibrosis Foundation**
- **W.K. Kellogg Foundation** - children
- **Howard Hughes Medical Institute** (invests in researchers, inc. Gilliam Fellows)
- **Breast Cancer Foundation of Alabama** - \$1.3 million for 24 projects in 2022. Current USA awardees are Drs. Chakroborty, del Pozo-Yauner and Singh (Seema)
- **Lions Club** – e.g. vision research



# **Grants development resources at USA**



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Grant Application Guide

Sponsors/Helpful Links

National Institutes of Health Information

PHS Financial Conflict of Interest

Responsible Conduct of Research

Roles and Responsibilities Chart

Definition of a Sponsored Project

Contact HS Grants

## Health Systems Grant Administration and Development Office



[News and Sponsor Information Regarding The Covid Pandemic can be found here.](#)

### Mission Statement

We partner with faculty and staff of the Colleges of Medicine, Nursing, Allied Health along with USA Health and the Mitchell Cancer Institute to provide our expertise during the research administration lifecycle of external and internal sponsored activities.

### Vision Statement

To be ambassadors focusing and leveraging our knowledge to enhance the university community by upholding standards of excellence.



**Ashley W. Turbeville, MBA, CRA**  
Executive Director, Research, Development and Administration  
Units: College of Medicine, Mitchell Cancer Institute, College of Nursing, Allied Health Professions, Simulation, USA Health



**Julie A. Flowers**  
Assistant Director  
Units: College of Medicine, Mitchell Cancer Institute, College of Nursing, Allied Health Professions, Simulation, USA Health  
Departments: Surgery, Internal Medicine, OBGYN, Neurology



**Ben Cumberland**  
Accountant II  
Units: Pharmacology



**Ashley Lawson**  
Research Portfolio Specialist I  
Units: Biochemistry, Pharmacology, Physiology and Family Medicine



**Darriane DeVine**  
Research Portfolio Specialist I  
Units: Microbiology/Immunology, Center for Healthy Communities, Pathology, Pharmacology



**Helen Moore**  
Research Specialist I  
Units: Mitchell Cancer Institute, Pharmacology

**Stephanie Ferguson**

**Victoria Nadeau**



## Health Systems Grants Administration and Development Bi-Weekly **Funding** Bulletin

October 9, 2023

This **funding alert** is a new resource developed by the Office of Health Systems Grants Administration and Development to help the faculty identify **funding** opportunities in their area/focus of research.

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### National Institutes of Health (NIH) **Funding** Opportunities

#### [Cancer Research Education Grants Program - Courses for Skills Development \(R25 Clinical Trial Not Allowed\)](#)

Due Dates: January 25, 2024; May 25, 2024; September 25, 2024

#### [Cancer Research Education Grants Program - Research Experiences \(R25 Clinical Trial Not Allowed\)](#)

Due Dates: January 25, 2024; May 25, 2024; September 25, 2024

#### [Cancer Research Education Grants Program - Curriculum or Methods Development \(R25 Clinical Trial Not Allowed\)](#)

Due Dates: January 25, 2024; May 25, 2024; September 25, 2024

#### [Developing novel theory and methods for understanding the genetic architecture of complex human traits \(R21 Clinical Trial Not Allowed\)](#)

Due Dates: February 16, 2024; June 16, 2024; October 16, 2024

#### [Health and Health Care Disparities Among Persons Living with Disabilities \(R01 - Clinical Trials Optional\)](#)

Due Dates: February 5, 2024; June 5, 2024; October 5, 2024

#### [Fc-Dependent Mechanisms of Antibody-Mediated Killing \(R01 Clinical Trial Not Allowed\)](#)

Due Date: January 26, 2024

#### [Advancing Research Careers \(ARC\) Predoctoral to Postdoctoral Transition Award to Promote Diversity \(F99/K00 - Clinical Trial Not Allowed\)](#)

Due Dates: June 13, 2024; October 11, 2024; February 13, 2025

#### [National Institute of General Medical Sciences Predoctoral Basic Biomedical Sciences Research Training Program \(T32\)](#)

Due Dates: January 25, 2024; May 25, 2024; September 25, 2024

#### [Additional NIH Funding Opportunities and Notices](#)

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### Foundations and Associations Available in Proposal Central [Grant Opportunities Available](#)

#### Other Foundation Grants are Listed Below

#### [Melanoma Research Alliance invites proposals for research](#)

Eligibility Checklist is Due October 20, 2023

#### [Burroughs Wellcome \*\*Fund\*\* invites applications for Career Awards for Medical Scientists](#)

Due Date: October 17, 2023

#### [Melanoma Research Alliance invites applications for Pilot Awards](#)

Due Date: November 3, 2023

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### Find **Funding** with Pivot

Take advantage of USA's subscription to [Pivot](#), a comprehensive **funding** opportunities database that features customized searches. Pivot is offered to faculty, staff and students. Access is available with your USA email address.

