
FEDERAL FUNDING

STEVEN MOLDIN, PHD

EXECUTIVE DIRECTOR

RESEARCH ADVANCEMENT

8/18/22





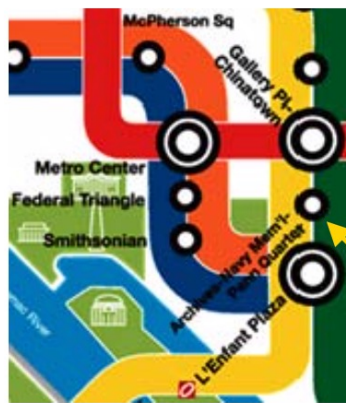
USC DC Office



DC Office Goals

- Provide USC presence near funding agencies
- Identify large-scale funding opportunities
- Form collaborations within and outside USC to develop competitive applications
- Support proposal preparation
- Navigate federal bureaucracy





701 Pennsylvania Avenue, NW, Suite 540

ORGANIZATIONAL CHART



DC Research Advancement Office Steven Moldin - Background

- PhD, clinical psychology (Yeshiva University); genetics research (Columbia U); postdoc, genetics (Washington U St. Louis)
- Faculty, Washington U School of Medicine
- Eleven years, senior NIH program official
 - 17 RFAs, PAs; 37 workshops
 - Mental disorders (autism, schizophrenia), genetics, genomics, neuroscience



DC Research Advancement Office James Murday - Background

- Ph.D, solid state physics (Cornell U)
- Forty years in chemistry, physics, and materials science at DOD's NRL and ONR
- Architect, US National Nanotechnology Initiative



DC Research Advancement Office

Allan Olson - Background

- Maintained senior leadership positions in private industry and the U.S. government involving research, strategic planning, program management, systems engineering
- Previous Director of Horizontal Technology Integration
- Holds degrees and certifications in program management, electrical engineering, contracting



RESEARCH ADVANCEMENT (ORA) - OFFICE OF RESEARCH RELATIONSHIPS

- ORA strategically pursues competitive federal funding opportunities with a targeted focus on large, multidisciplinary research endeavors
- Staff provide a wide variety of support services, from federal agency outreach, proposal conception, application submission, and post-submission (pre-award) support, e.g., site visits
- ORA is unique in that we are an institutional resource, available to assist faculty from all USC schools and programs. We are the only office to provide these services at the University level.
 - This is critically important to USC schools that do not have this type of support available at the school level
 - Our placement within the Office of Research is critically important to fostering and supporting multidisciplinary proposals that include faculty across USC schools
- In terms of interactions within the Office of Research, ORA provides support services that are complementary (but not duplicative) to those provided by other Office of Research organizations

Research Advancement Services

- Strategic planning
- Proposal preparation - scientific
 - Help develop 'vision'
 - Help build collaborations (within & outside USC)
 - Writing, reviewing, editing
- Proposal preparation – logistic/administrative
 - Conference/video calls, meetings
 - Budgets, budget justifications, PARs
 - Biosketches, letters of support
 - References, figures
- Federal agency connections / advocacy / intel
- Faculty development

How we can help you

Writing and Copy-Editing

- Review drafts for organization and responsiveness to solicitation
- Copy-edit drafts for grammar, clarity, and completeness
- Write de novo text for non-technical aspects of the proposal, e.g., outreach, administrative organization, USC assets
- Creation of graphics, organizational charts, and timelines
- Review summary statements and previous reviewer reports to provide guidance on resubmissions
- Generate drafts of support letters from consultants, advisory committee members, and other partners
- Generate drafts of supplementary documents required for submission

How we can help you

Budget Preparation

- Assist PIs and school/departmental staff to develop/revise budgets
- Prepare budget justifications
- Identify potential strategies for cost sharing

Administrative & Logistical Activities

- Coordinate collection of required documents from participating collaborators (including subcontractors), such as biosketches and letters of support
- Complete application forms for electronic or paper submission
- Ensure PIs obtain required governmental IDs and corresponding accounts (e.g. eRA Commons, NIH ASSIST)
- Ensure adherence to internal procedures and requirements prior to submission (e.g. disclose, Conflict of Interest)

How we can help you

Team Building

- Provide strategic input related to team composition and expertise
- Identify USC faculty as potential collaborators
- Identify faculty from other universities/organizations as potential partners

Proposal Organization and Planning

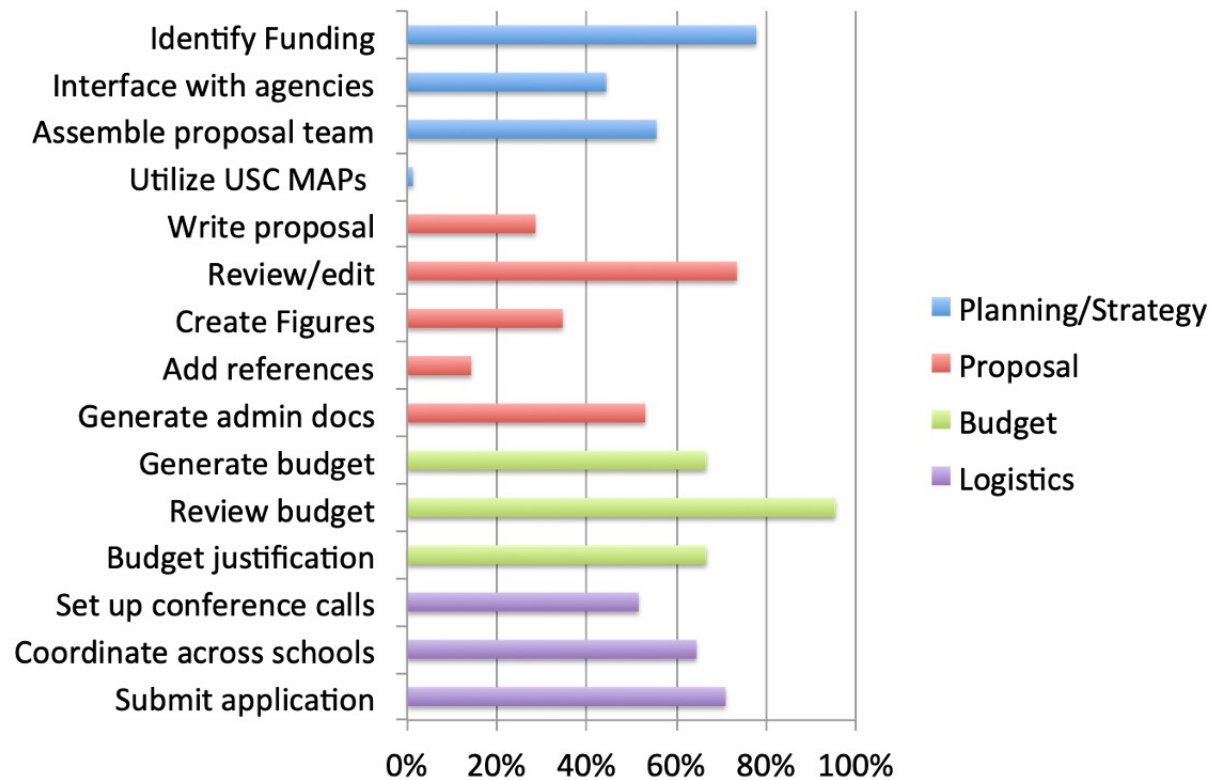
- Organize conference calls and face-to-face meetings
- Develop outlines of application components
- Create timelines for preparing and submitting applications
- Conduct analyses of existing projects funded under the targeted program to determine optimal team composition and leadership

How we can help you

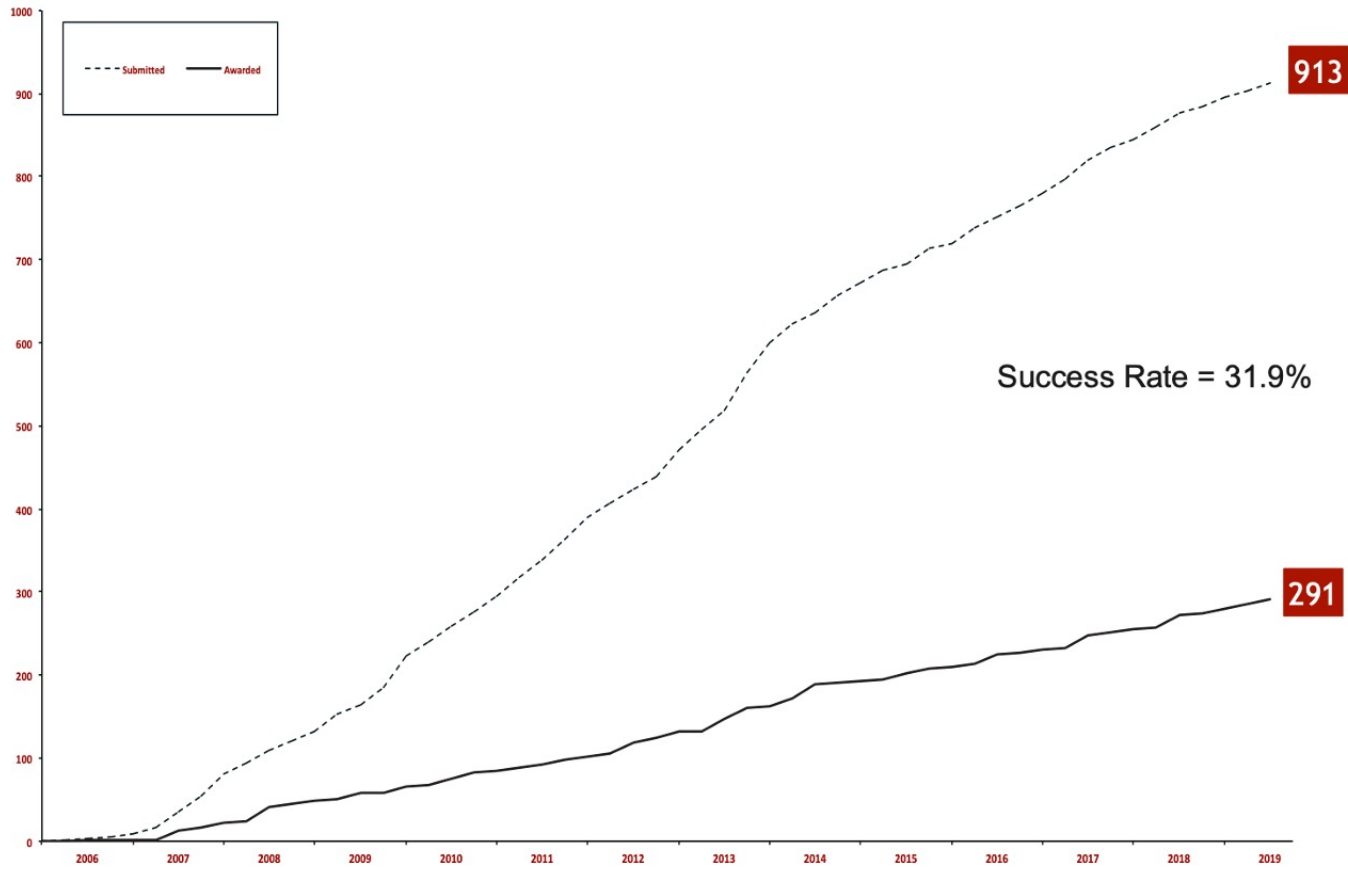
Proposal Submission

- Facilitate department approvals as required by USC Department of Contracts and Grants
- Coordinate the final on-time submission with USC Department of Contracts and Grants and other relevant USC offices

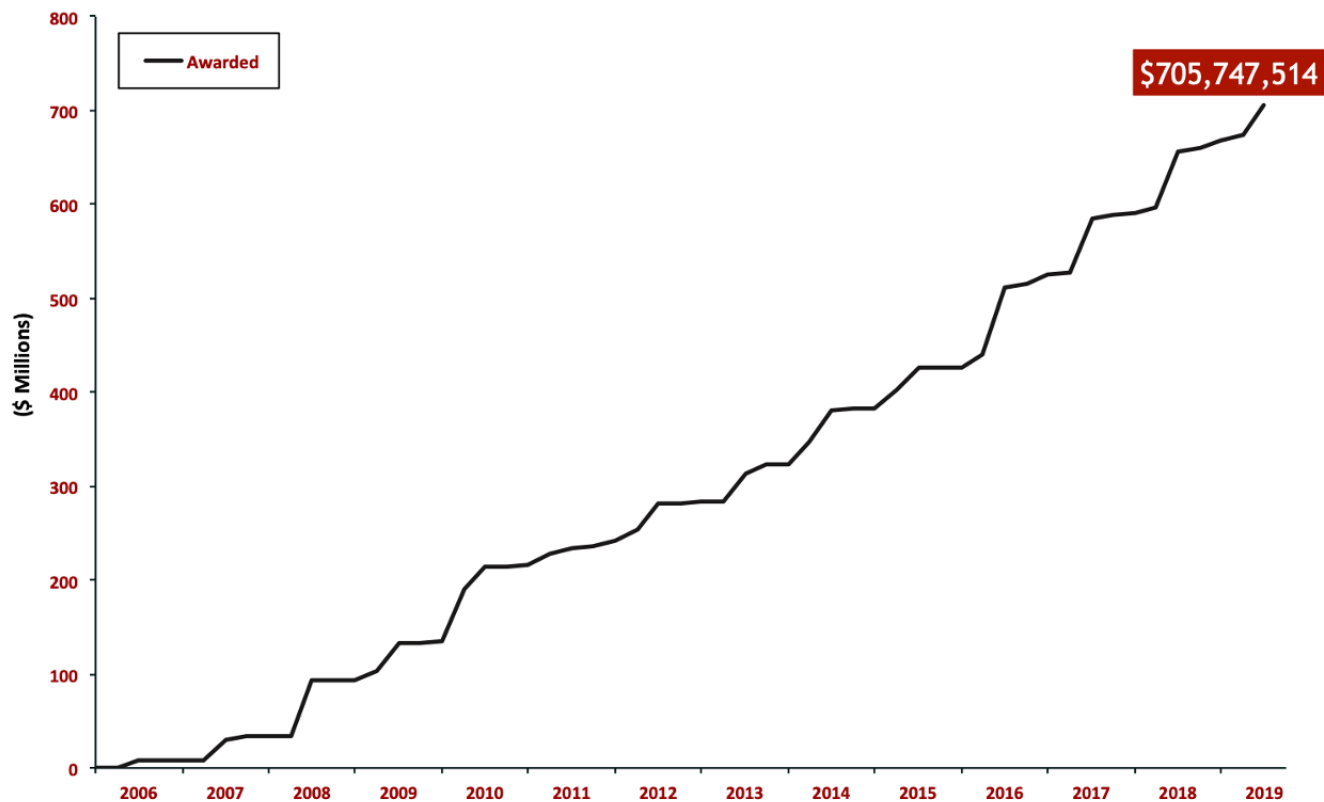
% of Assisted Faculty Who Have Utilized Research Advancement Services



DC Office of Research Advancement Applications Submitted and Awarded



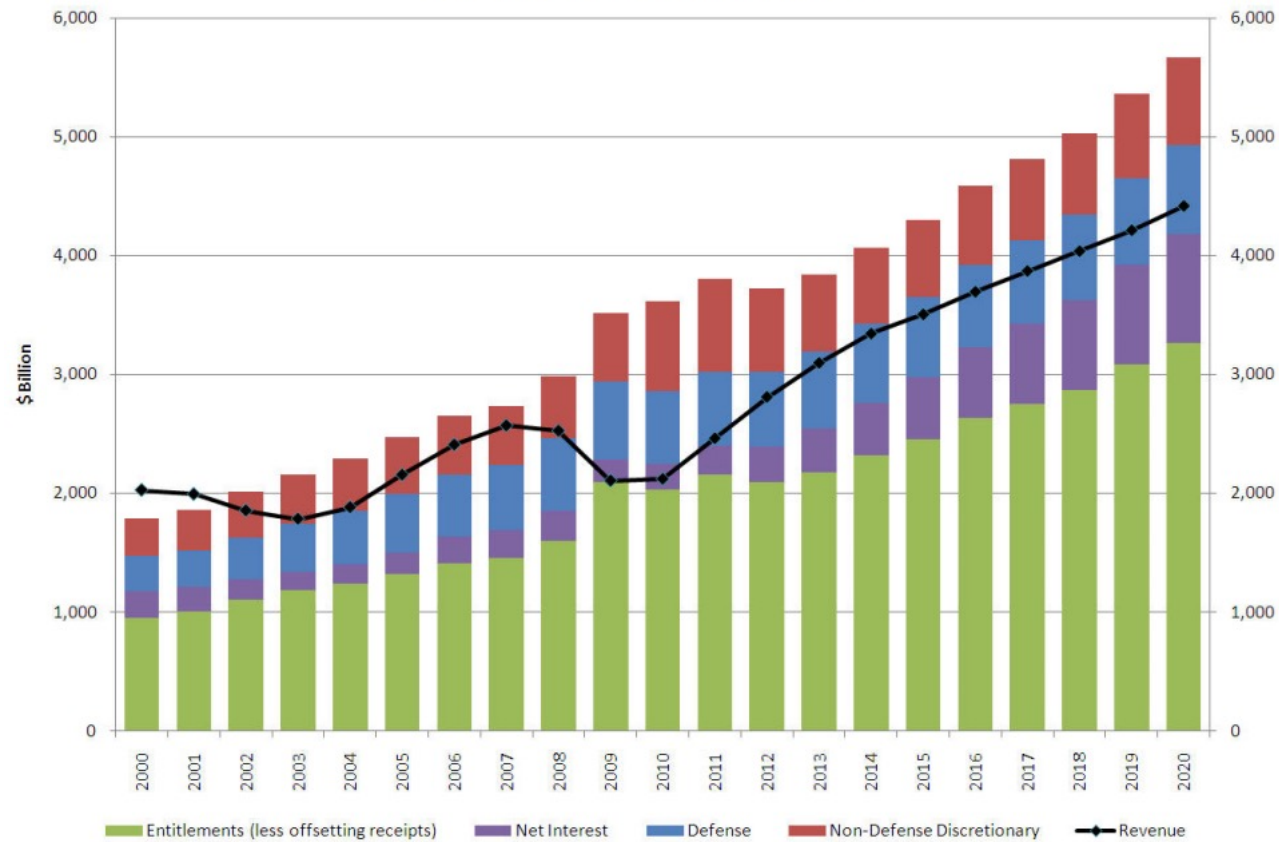
DC Office of Research Advancement Cumulative Dollars Awarded

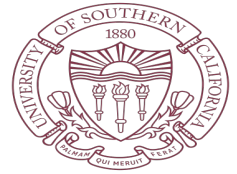




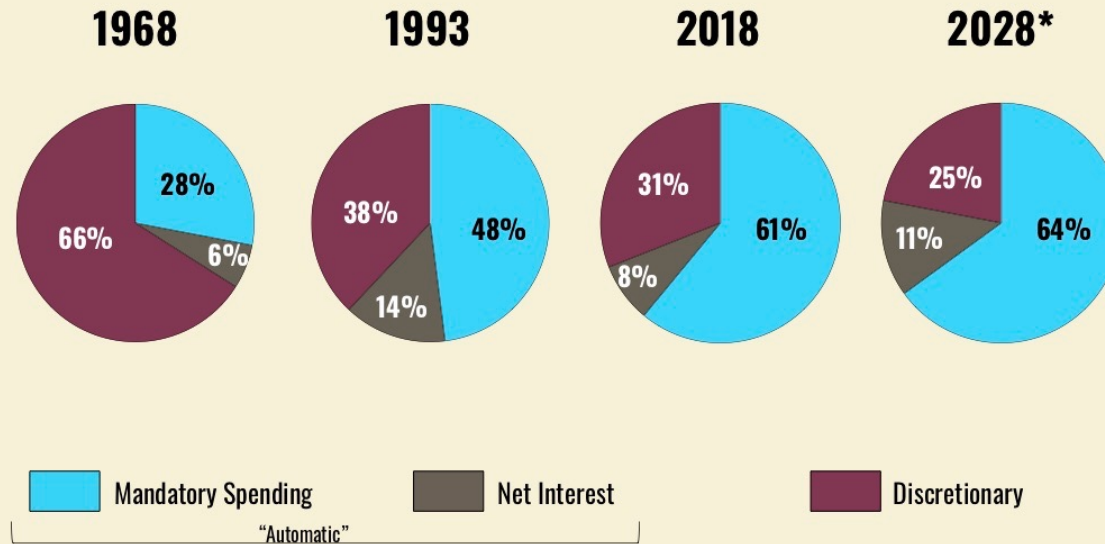
US Federal Revenues & Expenditures 2000-2020

Source: CBO (data after 2009 are projections)





Automatic Expenditures Are Consuming a Growing Share of the Budget

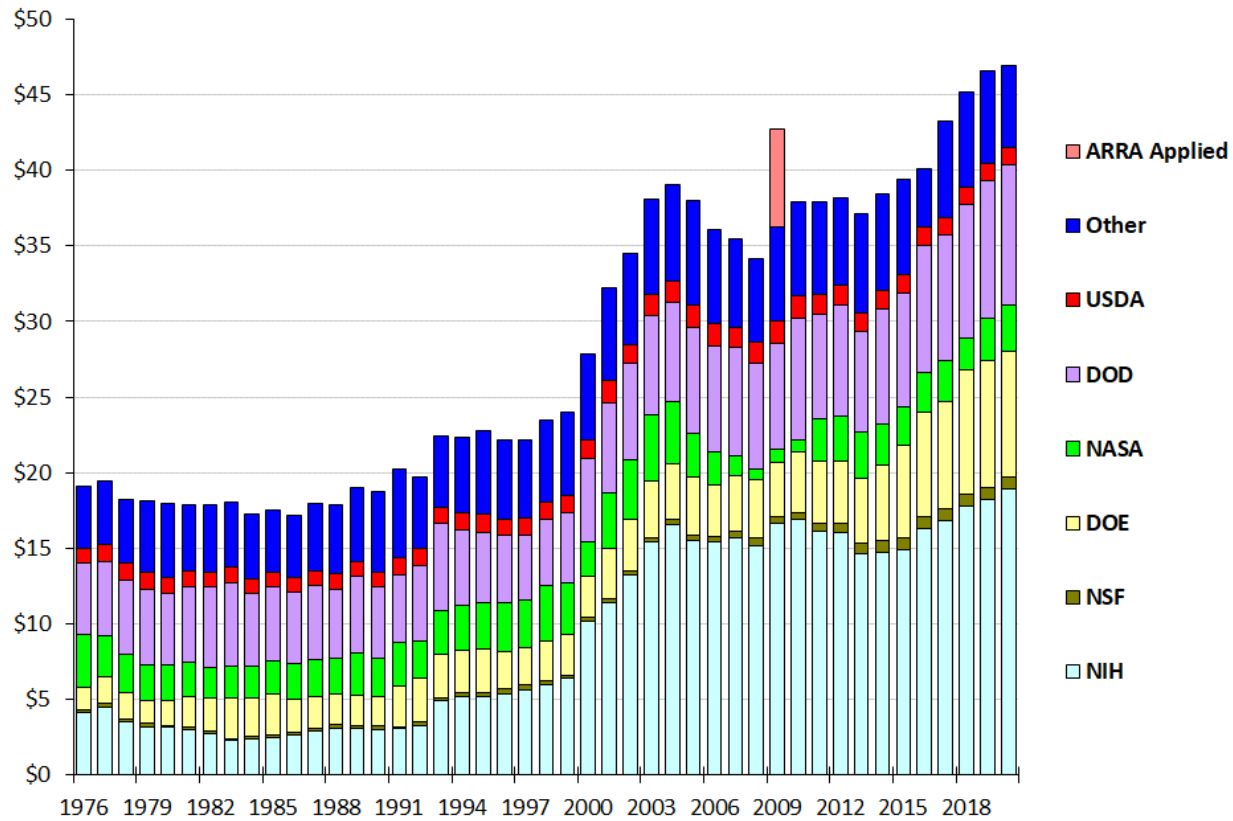


*Projected
Source: Congressional Budget Office, August 2019.



Trends in Applied Research by Agency, FY 1976-2020

Budget authority in billions of constant FY 2020 dollars



Based on AAAS analyses of OMB and agency budget documents and data. FY 2020 figures do not contain emergency COVID-19 R&D. © 2020 AAAS

NEW FUNDING OPPORTUNITIES

- ❖ DHHS ARPA-H
- ❖ New NSF directorate: TIP

ADVANCED RESEARCH PROJECTS AGENCY FOR HEALTH (ARPA-H)

- ❖ Initially proposed by POTUS as new sub-agency within NIH
- ❖ Described in detail - Collins, Schwetz, Tabak, Lander (2021): *Science* 373:6551, 165-167
- ❖ Inspired by Defense Advanced Research Projects Agency (DARPA)
- ❖ Tasked with supporting bold, high-priority, high-risk, high-reward research to accelerate biomedical breakthroughs
- ❖ Included in POTUS FY2022 budget - annual funding, \$6.5B
- ❖ House appropriations bill includes \$3B FY2022 funding to establish ARPA-H; Senate appropriations pending
- ❖ Strong focus on genomics/genetics/bioengineering/bioinformatics
- ❖ Diversity/health equity is critical
- ❖ Director and PMs will set the agenda
- ❖ Website: <https://www.nih.gov/arpa-h>

ARPA-H: NEW HOME FOR BOLD IDEAS IN BIOMEDICAL RESEARCH

- ❖ Bold ideas involve creating platforms, capabilities, and resources that could be applicable across many diseases
- ❖ Whereas traditional NIH proposals are “curiosity-driven,” these ideas are largely “use- driven” research—research directed at solving a practical problem

ARPA-H UNDERPINNINGS

- ❖ DARPA-like culture at NIH can drive biomedical and health advances
- ❖ Accelerate the pace of breakthroughs to transform medicine and health
- ❖ Flexible and nimble strategy, undeterred by the possibility of failure
- ❖ Past progress in medicine and health driven by two powerful forces - pathbreaking fundamental research and vibrant commercial biotechnology sector

HOW ARPA-H WILL BE STRUCTURED

- ❖ Research with specific milestones & accountability
- ❖ Fill gaps in research by bringing ‘disruptive innovation’
- ❖ Broad focus ranging from molecular to societal
- ❖ Support researchers who never would have been funded by NIH
- ❖ Selection process similar to DARPA - abstracts submitted and based on PM interest
- ❖ Not traditional peer review - proposals not ranked but determination will be made whether they meet requirements or not
- ❖ PMs will make funding decisions and build portfolios of projects using different approaches to solving challenge at hand
- ❖ DARPA-like structure of proposals – address Heilmeier Catechism questions (<https://www.darpa.mil/work-with-us/heilmeier-catechism>)

ARPA-H WILL NEED TO BE DIFFERENT FROM DARPA

Bold Health Breakthroughs Will:

- ❖ Interact with biological systems that are much more complex and more poorly understood than engineered systems, requiring close coupling to a vast body of biomedical knowledge and experience
- ❖ Interact with a complex world of many customers and users—including patients, hospitals, physicians, biopharma companies, and payers
- ❖ Interact in complex ways with human behavior and social factors
- ❖ Require navigating a complex regulatory landscape

ARPA-H UPDATE

- ❖ Anticipated yearly funding - \$2.4B - \$3B
- ❖ Main point of discussion: located within DHHS but not within NIH

NSF DIRECTORATE FOR TECHNOLOGY, INNOVATION, AND PARTNERSHIPS (TIP)

- ❖ Bipartisan support in House and Senate bills to create a new directorate; important element of the nation's innovation agenda
- ❖ The proposed Directorate for Technology, Innovation, and Partnerships (TIP) will:
 - Advance science and engineering research and innovation that lead to breakthrough technologies, as well as generating solutions to national and societal challenges
 - Accelerate the translation of fundamental discoveries from lab to market
 - Create education pathways & support a diverse workforce
- ❖ Cross-cutting platform that leverages, energizes, and rapidly brings to market and to society innovations that result from all NSF investments
- ❖ POTUS FY2022 budget includes TIP annual funding of \$865M. Congress is expected to finalize funding for the new directorate in some capacity

NSF TIP GOALS

- ❖ Advance science and engineering research and innovation leading to breakthrough technologies as well as solutions to national and societal challenges, sustaining and enhancing U.S. competitiveness on a global stage
- ❖ Accelerate the translation of fundamental discoveries from lab to market, advancing the U.S. economy
- ❖ Create education pathways for every American to pursue new, high-wage, good-quality jobs, supporting a diverse workforce of researchers, practitioners, and entrepreneurs

NSF TIP UNDERPINNINGS

- ❖ Building on NSF's longstanding leadership in scientific and engineering research and education, TIP will effectively serve as a cross-cutting platform that leverages, energizes, and rapidly brings to the market and to society the innovations that result from all of NSF's investments
- ❖ TIP will open up new possibilities for research and education by catalyzing strategic partnerships linking academia, industry, government, philanthropy, investors, and civil society to cultivate 21st-century local, regional, and national innovation ecosystems, ensuring U.S. leadership in critical technologies as well as national and societal challenges
- ❖ TIP investments strongly align with Administration priorities, including the Build Back Better and Racial Equity pillars, and with Congressional priorities

NSF TIP INNOVATION ECOSYSTEM

- ❖ TIP will cultivate new innovation ecosystems at the scale of individual communities and regions throughout the U.S., advancing use-inspired, solution-oriented research and innovation in a range of technology areas, e.g.:
 - ✓ Artificial intelligence
 - ✓ Quantum information science
 - ✓ Advanced wireless
 - ✓ Advanced manufacturing
 - ✓ Semiconductors

- ❖ TIP will further cultivate new innovation ecosystems in a diverse set of national-challenge areas of priority to the Administration and Congress, e.g.:
 - ✓ Climate change
 - ✓ Biotechnology

NSF TIP PROPOSED ACTIVITIES (CONT)

- Oversee Innovation Corps and Convergence Accelerator programs: “solutions-oriented” research
- Establish “Regional Innovation Accelerators:” (\$10M/yr over 10 years) and an Entrepreneurial Fellowship program to help scientists and engineers mature ideas into marketable products

HOW NSF TIP WILL BE STRUCTURED

- ❖ Research with specific milestones & accountability
- ❖ Fill gaps in research by bringing ‘disruptive innovation’
- ❖ Broad focus ranging from molecular to societal
- ❖ Support researchers who never would have been funded by NSF
- ❖ Selection process MAY BE similar to DARPA - abstracts submitted and based on PM interest
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- ❖ PMs MAY make funding decisions and build portfolios of projects using different approaches to solving challenge at hand

NSF TIP FOCUS

- ❖ Three TIP divisions (Innovation Ecosystems, Technology Frontiers, and Translational Impact) and a Partnerships Office will focus on:
 - Artificial intelligence & machine learning;
 - High-performance computing, semiconductors, & advanced computer hardware;
 - Quantum computing & information systems;
 - Robotics, automation, & advanced manufacturing;
 - Natural & anthropogenic disaster prevention or mitigation;
 - Advanced communications technology;
 - Biotechnology, medical technology, genomics, & synthetic biology;
 - Cybersecurity, data storage, & data management technologies;
 - Advanced energy, batteries, & industrial efficiency;
 - Advanced materials science, engineering, & exploration relevant to other focus areas

TIP Funding for NSF-Wide Investments¹
(Dollars in Millions)

Area of Investment ^{2,3}	FY 2020 Actual	FY 2021 Estimate	FY 2022 Request
Advanced Manufacturing	\$26.58	\$24.63	\$54.63
Advanced Wireless Research	0.60	0.55	30.55
Artificial Intelligence	67.66	61.55	121.55
Biotechnology	9.27	9.06	69.06
Climate: Clean Energy Technology	48.47	52.47	52.47
Microelectronics and Semiconductors	17.71	20.23	50.23
Quantum Information Science	15.47	18.42	48.42

¹ FY 2020 and FY 2021 funding is adjusted for comparability to reflect the movement of activities to TIP in FY 2022.

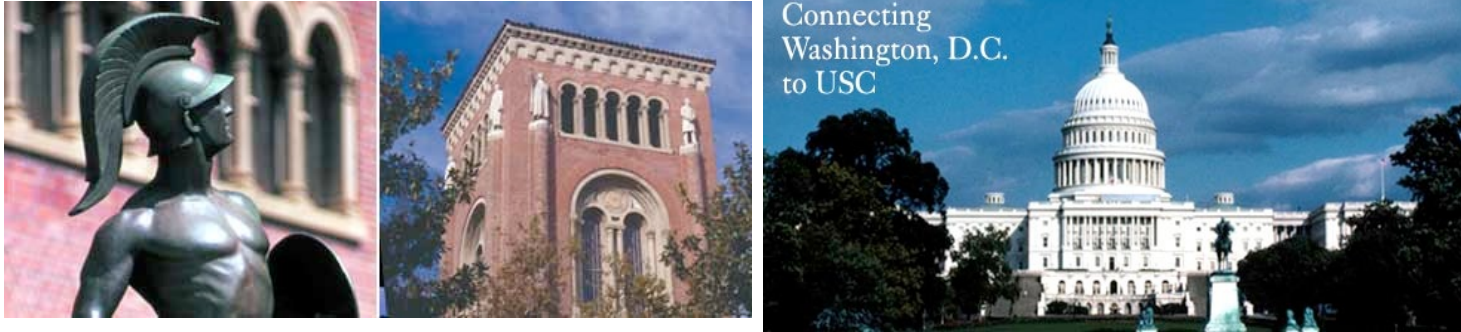
² NSF-Wide investments may have funding overlap and thus should not be summed.

³ This table reflects this directorate's support for selected areas of investment. In other directorate narratives, areas of investment displayed in this table may differ and thus should not be summed across narratives.

Federal Funding

- Research Support
 - DOD Young Investigator Program (DOD YIP)
 - NSF Faculty Early Career Development Program (NSF CAREER)
 - DOE Early Career Research Program
 - NIH individual fellowship and career development awards (pre- and postdoctoral; clinical and basic; mentored and non-mentored)
 - [NIH Transformative Research Awards \(R01\)](#)
 - NIH [Pioneer Award Program \(DP1\)](#)
 - NIH [Director's New Innovator Award Program \(DP2\)](#)
 - NIH & NSF institutional training grants (T32, NRT)
- Lab Infrastructure Support
 - NIH Shared Instrumentation Grant Program (S10)
 - NSF Major Research Instrumentation Program (MRI)
 - DOD Defense University Research Instrumentation Program (DURIP)





DC Office for Research Advancement

Additional questions, advice:

Dr. Steven Moldin

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