National Institute of Biomedical Imaging and Bioengineering (NIBIB) Mission/Vision

National Institutes of Health (NIH): Building Research Capacity in WV

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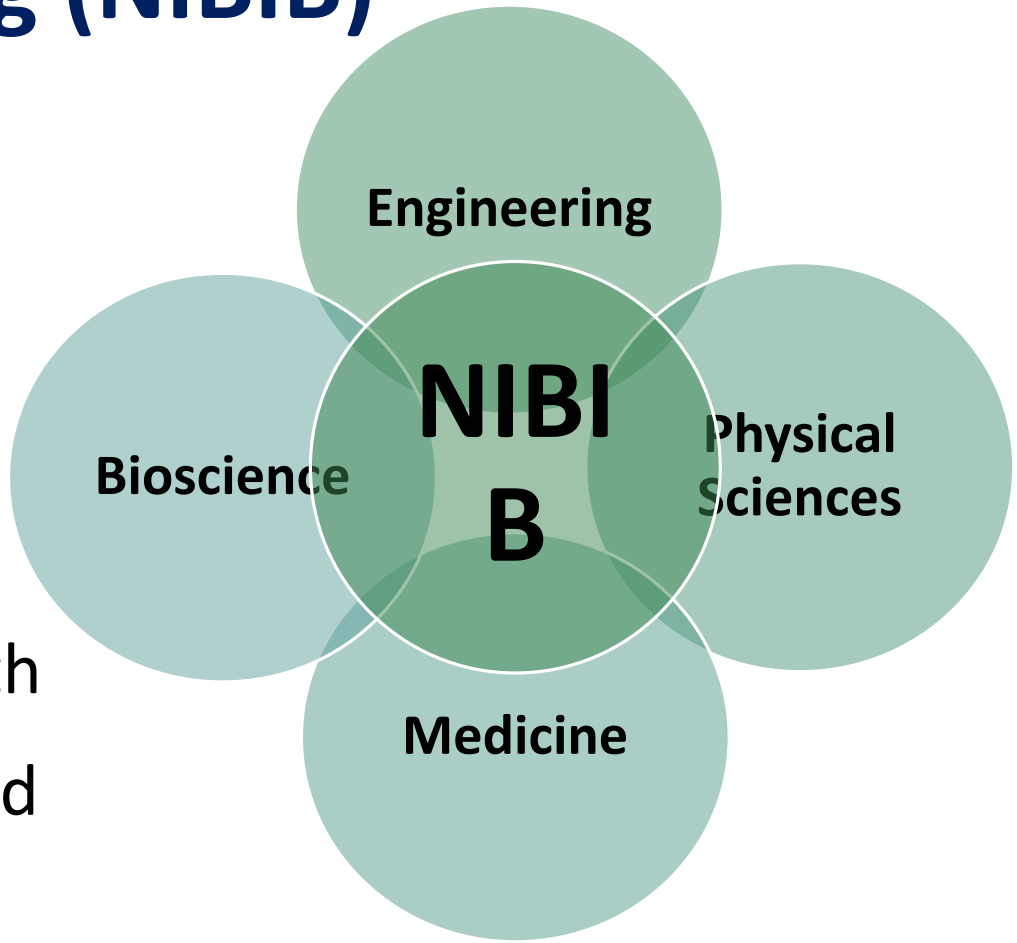
https://www.nibib.nih.gov/

National Institute of Biomedical Imaging and Bioengineering

National Institute of Biomedical Imaging and Bioengineering (NIBIB)

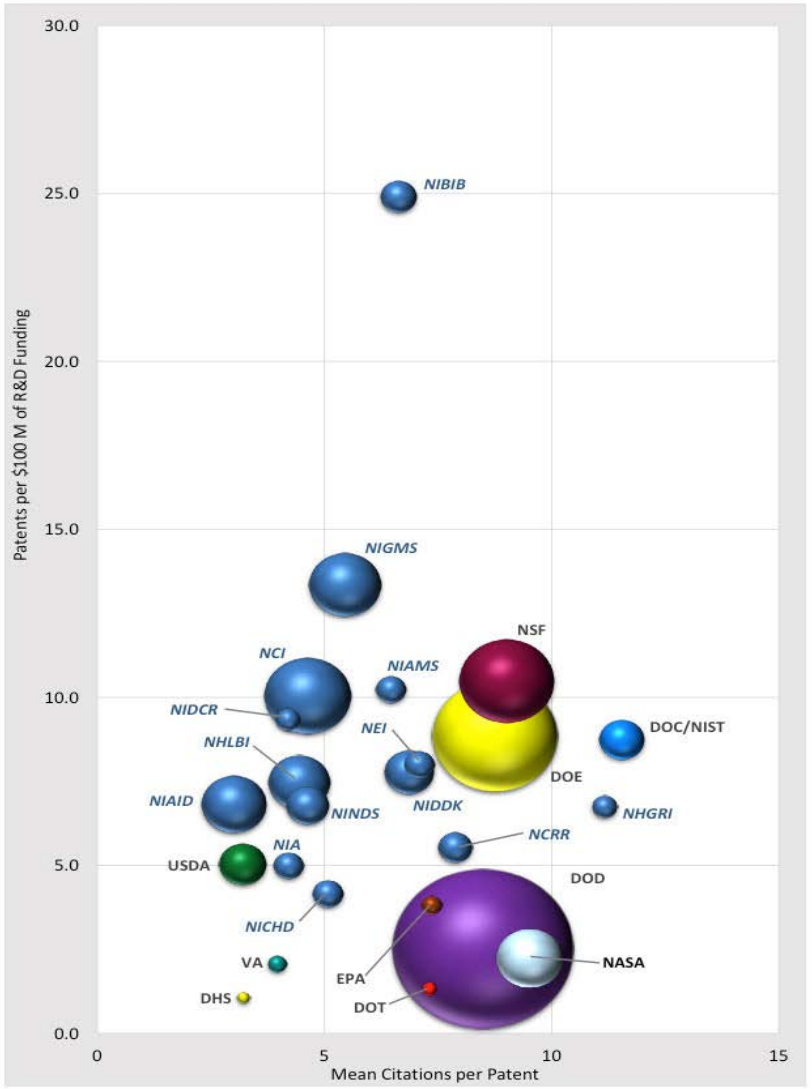
- **Mission:** Lead the development and accelerate the application of biomedical technologies to improve health
- Operates at the interface of physical sciences, life sciences and engineering
- Creates new technologies to improve health
- Catalyzes innovation across NIH and beyond



National Institute of Biomedical Imaging and Bioengineering (NIBIB)

- Technology Development
- Enabling tools/approaches
- No disease or tissue/organ focus

Figure 6. Federal Agency Patent Analysis Estimate with Key NIH ICs - All Identified Patents: 2000-2013



Note: Based upon FEDERAL GOVERNMENT INTEREST data set with 63,699 distinct patents.
Includes the specific 14 NIH ICs with at least 400 patents from the NIH GOVERNMENT INTEREST/ADJUSTED data set.

Handheld Ultrasound

Then

Now

GE Vscan

Microneedle Flu Vaccine Patch

Then

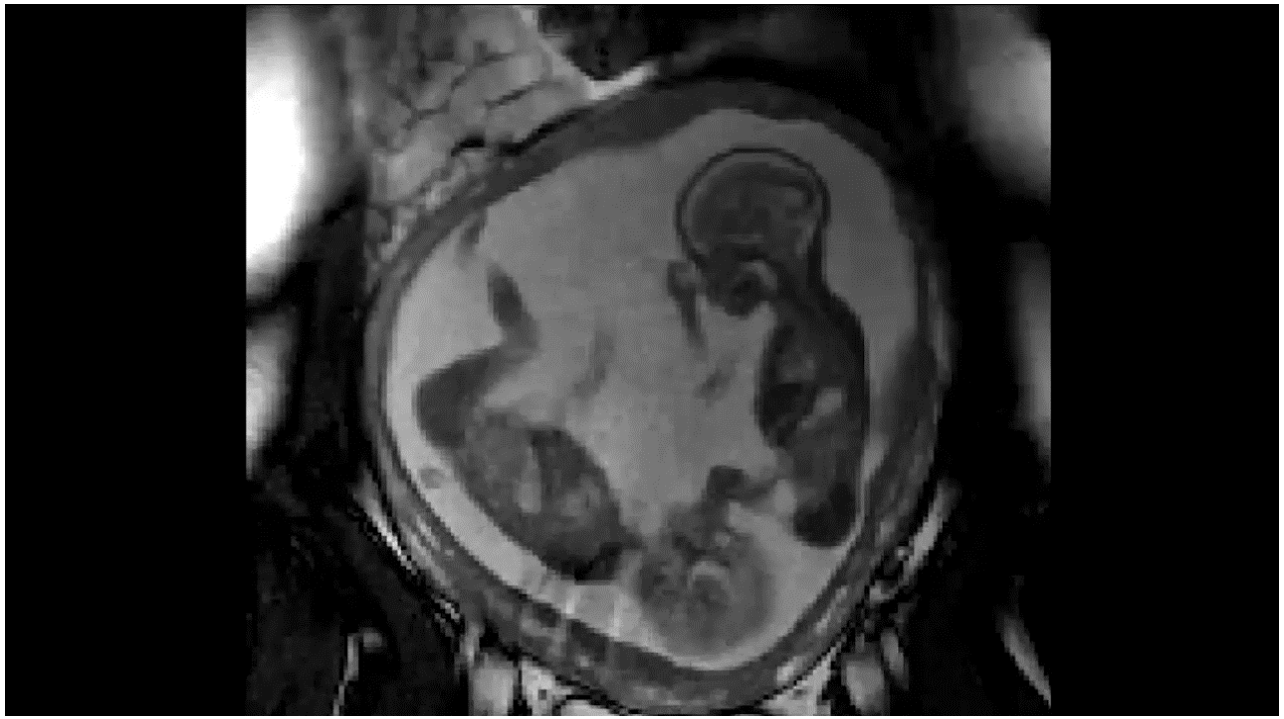
Now

M. Prausnitz, 2017

Imaging the Human Fetus

Then

Now



Seshamani, Studholme, 2016

NIBIB Scientific Program Areas

https://www.nibib.nih.gov/research-funding

Division of Applied Science & Technology (DAST)

IMAGING

- Image-Guided Interventions
- Magnetic Resonance Imaging
- Bio-Electromagnetic Technologies
- Molecular Imaging
- Nuclear Medicine
- Optical Imaging and Spectroscopy
- Ultrasound: Diagnostic and Interventional
- X-ray, Electron, and Ion Beam

Division of Discovery Science & Technology (DDST)

BIOENGINEERING

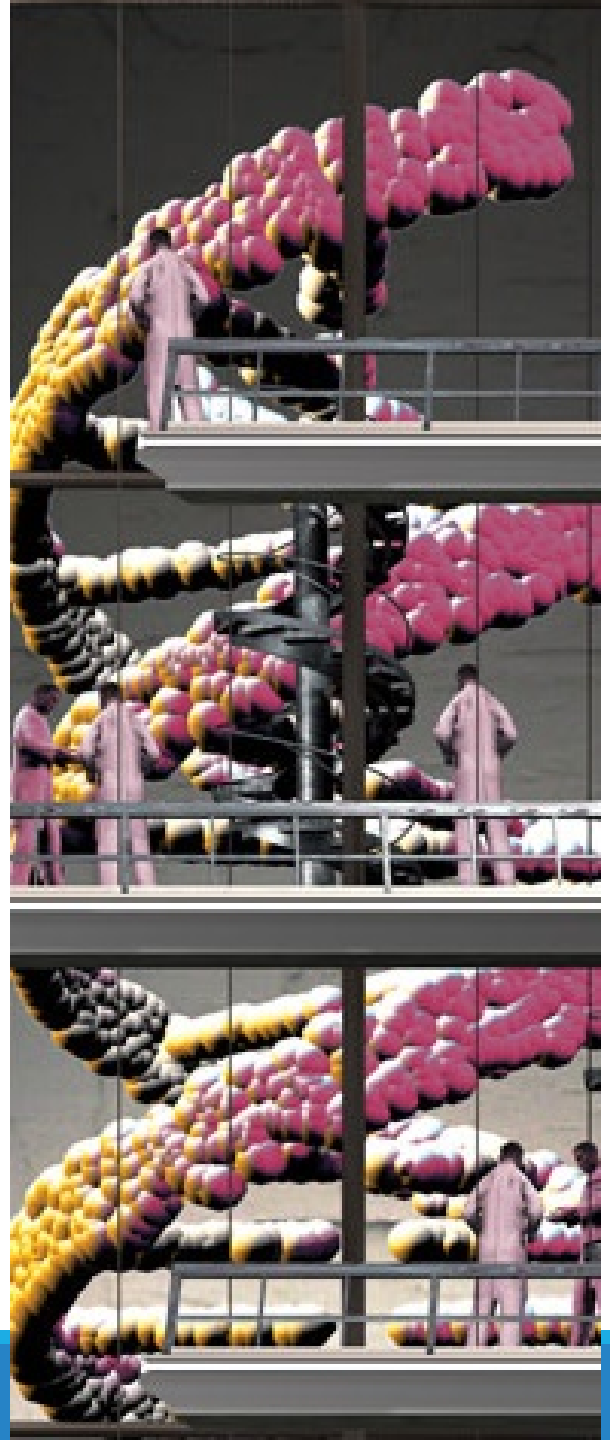
- Biomaterials
- Biosensors
- Delivery Systems and Devices for Drugs and Biologics
- Immunoengineering
- Mathematical Modeling, Simulation and Analysis
- Microfluidic Bioanalytical Systems
- Rehabilitation Engineering and Implantable Medical Devices
- Surgical Tools, Techniques and Systems
- Synthetic Biology for Technology Development
- Tissue Chips
- Tissue Engineering

Division of Health Informatics Technologies (DHIT)

- Biomedical Informatics
- Connected Health
- Image Processing, Visual Perception and Display
- Point of Care Technologies

Division Of Interdisciplinary Training (DIDT)

- Undergraduate & Graduate
- Predoctoral
- Postdoctoral
- Junior Investigator
- Clinician-Scientist
- Diversity
- Conference Support



NIH Bioengineering Program Announcements

- **PA-18-286**: Exploratory/Developmental Research Grants (R21)
  to establish the feasibility of technologies, techniques or methods that: 1) explore a new multidisciplinary approach to a biomedical challenge; 2) are high-risk but have high impact; and 3) develop data that may lead to significant future research. Preliminary data allowed, but not required.
  [Note: NIBIB supports R21s via PAR-18-433 and PAR-18-207 (next slides). Not via this announcement.]

- **PA-18-206**: Bioengineering Research Grants (BRG) (R01)
  integrated, systems approach to basic and applied multi-disciplinary research that addresses important biological, clinical or biomedical research problems

- **PAR-18-208**: Bioengineering Research Partnerships (BRP) (U01)
  team approach to basic, applied, and translational multi-disciplinary research to establish a robust engineering solution to a biomedical problem

https://www.nibib.nih.gov/research-funding/bioengineering-research-partnerships/FAQ

useful website

NIBIB Exploratory/Developmental Research (R21) Grant Program (PAR-18-433)

- NIBIB R21 applications expected to propose research which is exploratory, developmental, and **high-risk/high-reward**, aligning with the goals of the R21 grant mechanism (**non-incremental**)
- **No** preliminary data that demonstrate the feasibility of the specific aims are allowed
- $275,000 in direct costs over 2 years
- Contact NIBIB for pre-application advice: randy.king@nih.gov

NIBIB R21 Trailblazer (PAR-18-207)

- **New and Early Stage Investigator**
- **Consistent with NIBIB mission:** research at interface of the life sciences with engineering and the physical sciences
- **Enhanced R21 Exploratory/Developmental Grant mechanism**
  - $400,000 in direct costs over three years
  - pursue a new or emerging research program (exploratory, developmental, proof of concept, or high risk-high impact)
  - Technology design-, discovery- or hypothesis-driven
- **Differ substantially from current thinking or practice**
  - **Minimal** preliminary data (half page, one figure)

Contact NIBIB for pre-application advice: randy.king@nih.gov

ESTEEMED

Enhancing **S**cience, **T**echnology, **E**ngin**E**ering, and **M**atch **E**ducational **D**iversity

Diversity Training (R25 Award) PAR-17-221

- Enhance the **diversity** of the biomedical research workforce
- **Undergraduate** students in **STEM** fields
- Participants ultimately intending to purse Ph.D. or M.D./Ph.D. and a biomedical research career
- Institutions with an active **Advanced Honors Program** supporting underrepresented students in their junior and senior years are eligible to apply.
- Next Due Date: April 24, 2019
- NIBIB Contact: Dr. Zeynep Erim

DEBUT Design by Biomedical Undergraduate Teams Challenge

First Place - $20,000

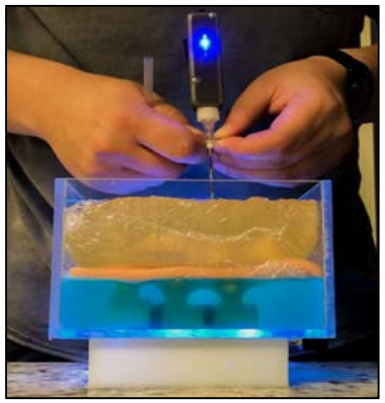
CortiTech *(Johns Hopkins University)*

Minimally invasive brain retractor for deep-seated lesions.

Second Place - $15,000

The Voyager *(Clemson University)*

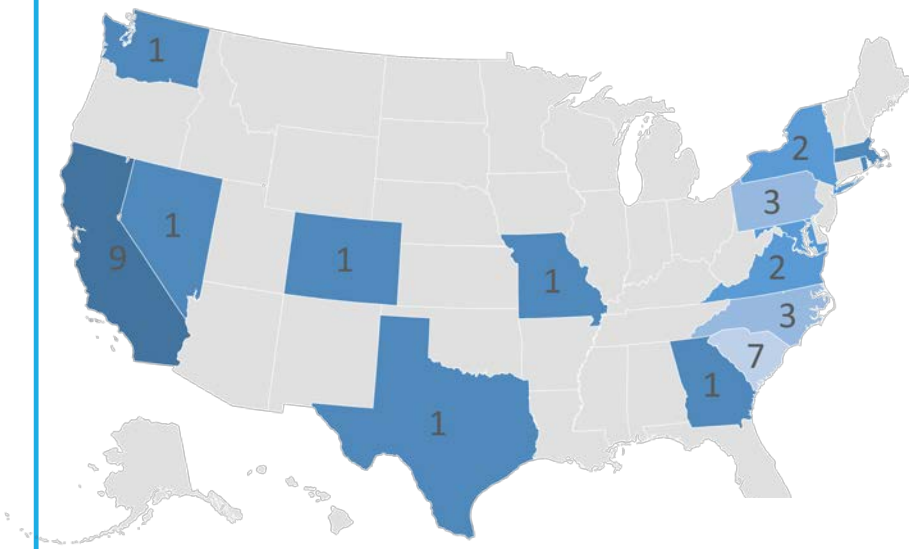
Tibial resection tissue protector.



Third Place - $10,000

Neuraline *(Georgia Institute of Technology)*

Epidural anesthesia placement tool used in labor and delivery.



Award ceremony at

- Biomedical Engineering Society (BMES) Annual Meeting
- October 18, 2018; Atlanta, Georgia
- Dedicated parallel session featuring DEBUT winners

Concept to Clinic: Commercializing Innovation (C3i) (PA-18-702)

Goal

Provide NIH grantees with essential business training and specialized mentoring for successful translation of biomedical technologies from lab to market

Objectives

1) Validate an unmet market need
2) Validate a viable business opportunity
3) Build a compelling pitch to secure support from investors and partners

Outcomes

- ✓ 37 SBIR/STTR companies and 17 R01 teams have participated over the past 4 years
- ✓ 6 companies selected to pitch to investors
- ✓ $15M received in Phase II SBIR/STTR grants with success rate of 66%
- ✓ >$75M raised in private capital to date
- ✓ 2 products have received FDA 510(k) clearance

NIBIB Contact: Mr. Todd Merchak merchakt@mail.nih.gov

Proposed FY19 Initiatives

ImmuneChip: Engineering Microphysiological Immune Tissue Platforms

Develop an in vitro (Tissue Chip) model of the human immune system

Resources for Technology Dissemination

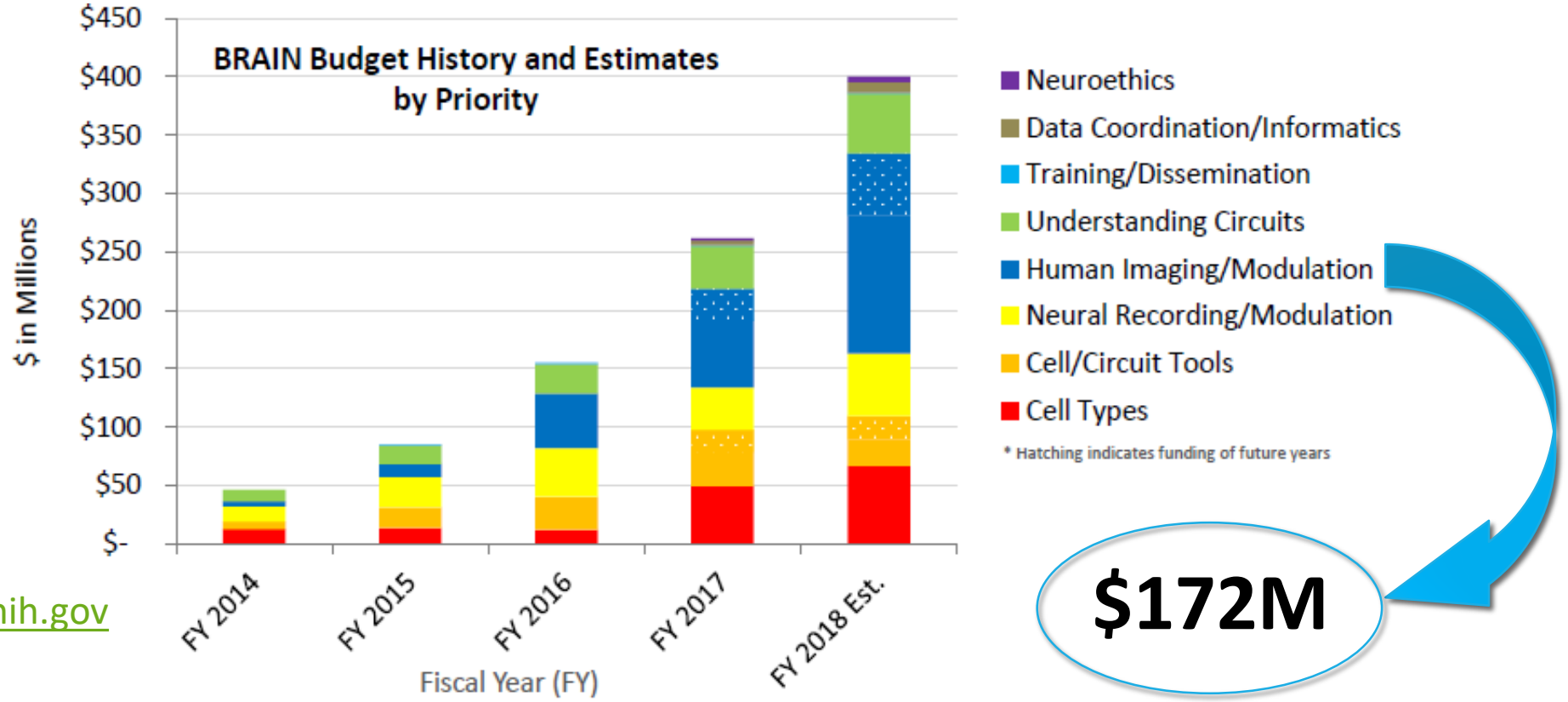
Improve the accessibility of NIBIB-funded cutting-edge tools by the broader community

Affordable and Accessible Monitoring of Physiological Systems

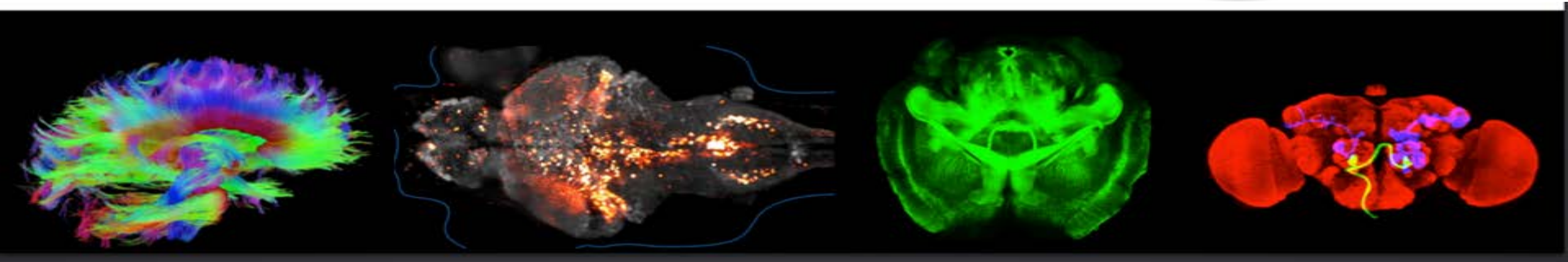
Accelerate the translation of wearable and minimally invasive diagnostic and monitoring systems

NIH BRAIN INITIATIVE

Total projected Budget for BRAIN:
$4.9B through 2026



https://www.braininitiative.nih.gov



SPARC - Stimulating Peripheral Activity to Relieve Conditions

- **Mission:** Develop therapeutic targets for peripheral neuromodulation by **mapping the autonomic nervous system in relation to major organs**

- NIH Common Fund Program
- ~$238 million in Phase 1 (2014 – 2021)
- Currently planning Phase 2
- https://commonfund.nih.gov/sparc

NIH Guide
For Grants and Contracts
U.S. Department of Health and Human Services

- Announces NIH Scientific Initiatives
- Provides NIH Policy and Administrative Information
- Supplies links to application forms
- Available on the NIH Web Site: https://grants.nih.gov/funding/searchguide
- Published each Friday – subscribe today!

What Does NIH Already Support in My Interest Area?

http://report.nih.gov/index.aspx

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- **Contact the Review Offices of Each Relevant IC**

www.csr.nih.gov/review4CSR

New NIBIB Director Selected

Bruce Tromberg, Ph.D.

- Professor of Biomedical Engineering and Surgery, University of California, Irvine
- Director of the Beckman Laser Institute and Medical Clinic

Thank you!

David T. George, Ph.D.
Acting Deputy Director
National Institute of Biomedical Imaging
and Bioengineering

David.George@nih.gov