

EnCON2017
Advancing Technology for Humanity
November 10

“Human Health Requires Great Engineering: NIH And You!”

Zorina S. Galis, Ph.D.

Chief, Vascular Biology and Hypertension Branch
Division of Cardiovascular Sciences
National Heart, Lung, and Blood Institute (NHLBI)

National Institutes of Health



Conflict disclosures

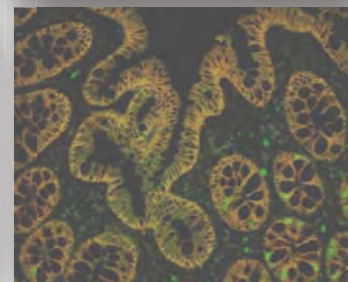
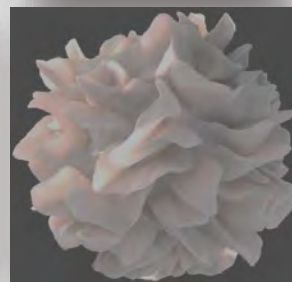
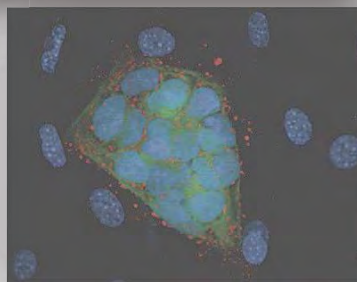
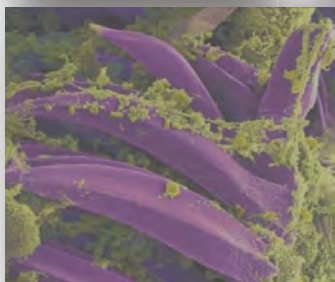
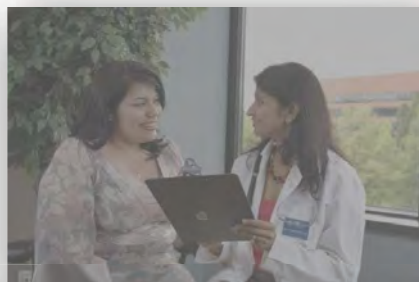
- I am an NIH employee.
- **Note:** The opinions presented do not necessarily represent the opinions of the National Heart, Lung, and Blood Institute (NHLBI)

Main points

- NIH and research funding
- “Got idea?” Practical tools to identify:
 - Funding opportunities
 - Collaborators
 - Other resources
- The natural history of an NIH application
 - NIH Peer Review process
 - Application

NIH

Turning Discovery Into Health



National Institutes of Health (NIH)

Within the U.S. Department of Health and Human Services (HHS)



Office of the Secretary
DHHS

Administration
for Children
and Families

Administration
on
Aging

**National
Institutes
of Health**

Agency for
Healthcare
Research and
Quality

Agency for
Toxic Substances
and Disease
Registry

Centers for
Disease Control
and Prevention

Centers for
Medicare &
Medicaid
Services

Food and Drug
Administration

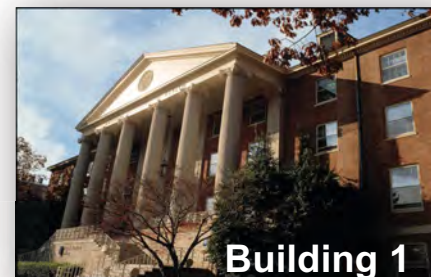
Health
Resources
and Services
Administration

Indian
Health
Service

Substance Abuse
and Mental Health
Services
Administration

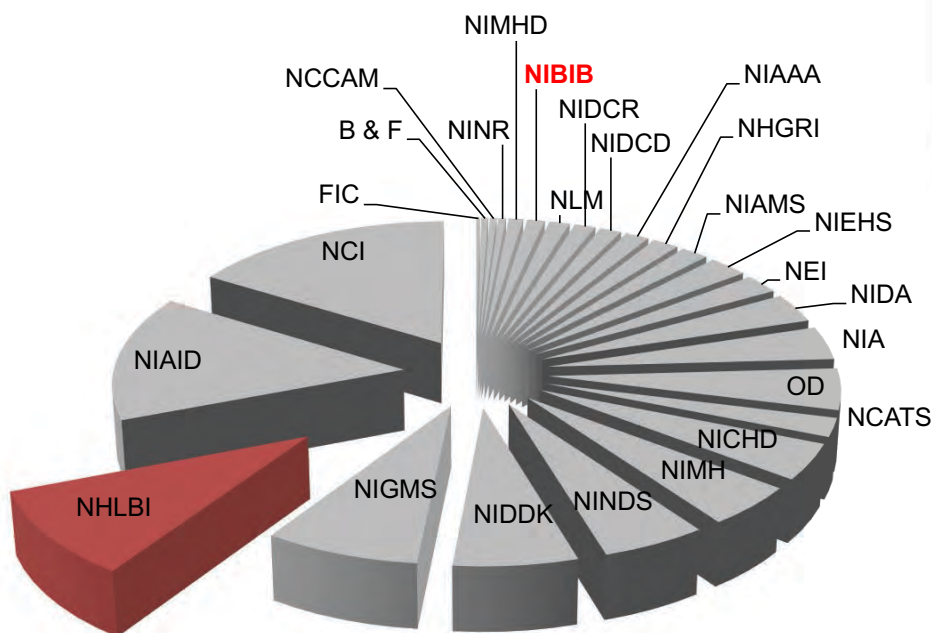
Getting to know the NIH

NIH is the largest source of funding for medical research in the world



FY2015 Enacted

NCI: \$4.9 B
NIAID: \$4.4 B
NHLBI: \$3 B
NIGMS: \$2.4 B
NIDDK: \$1.9 B





***“What did we get for \$\$\$
in research funding?”***

***Measuring research
impact is not easy...***



“THIS is what we all got for \$\$\$ in NIH research funding...”

- **Health:** U.S. **death rates** from heart disease and stroke have **fallen more than 60%** in the last half-century.
- **Knowledge:** basic research is critical for scientific discoveries, 211 NIH-supported researchers received Lasker Awards and **145 won Nobel Prizes**
- **Economy:** Every \$1 of NIH funding generates in average \$2.21 **in local economic growth.**
 - **One great example:** U.S. government invested \$4 billion in the Human Genome Project which spurred an estimated \$965 billion in economic growth from 1988-2012 = **178-fold return on investment, after adjusting for inflation.**
 - **In FY2011 NIH-funded research supported an estimated 432,000 US jobs at more than 2,500 universities.**

**We have a major....
“ENGINEERING” problem!!**



Turning Discovery Into Health...



WE WANT YOU!

- Applying engineering thinking and processes (problem solving, rapid prototyping, testing, team approach, etc.)
- Development of cutting edge, sophisticated research tools (analysis, computation, integration, etc.)
- New biomedical devices and interventions

Looking for NIH Opportunities

NIH National Institute of Biomedical and Bioengineering
Creating Biomedical Technologies to Improve Health

HOME RESEARCH FUNDING LABS AT NIBIB

Food
Tumor comb
Devel
NIH B
non-II

Funding Opportunities

BRAIN Initiative: Theories, Models and Methods for Analysis of Complex Data from the Brain (R01 Clinical Trial Not Allowed)

BRAIN Initiative: Proof of Concept Development of Early Stage Next Generation Human Brain Imaging (R01 Clinical Trials Not Allowed)

BRAIN Initiative: Development of Next Generation Human Brain Imaging Tools and Technologies (U01) (Clinical Trials Not Allowed)

NIBIB Exploratory/Developmental Research Grant Program (R21)

Integr
Point
X-ray
Conne
Interd
Molec
Rehab
Devic
Mathe

NIH National Institutes of Health
Office of Strategic Coordination

Common Fund Programs

Dynamic DNA Loops Affect How Cells Become Specialized

Learn more »

Common Fund At a Glance

COMMON FUND
Face to Face

Program	New Tools and methods	Data and
4D Nucleome		
Big Data to Knowledge		
Enhancing the Diversity of the NIH-Funded Workforce		
Epigenomics		
Extracellular RNA Communication		
Gabriella Miller Kids First Pediatric Research Program		
Genotype-Tissue Expression (GTEx)		
Global Health		
Glycoscience		
HCS Research Collaboratory		
Health Economics		
NIH-ADSK RESEARCH: NIH Director's Early Independence Award (EIA)		
NIH-ADSK RESEARCH: NIH Director's New Innovator Award		
NIH-ADSK RESEARCH: NIH Director's Pioneer Award		
NIH-ADSK RESEARCH: NIH Director's Transformative Research Awards		
The Human BioMolecular Atlas Program (HuBMAP)		
Human Microbiome Project (HMP)		
Illuminating the Druggable Genome		
Knockout Mouse Phenotyping (KOIM ²)		
Library of Integrated Network-based Cellular Signatures (LINCS)		
Metabonomics		
Molecular Transducers of Physical Activity in Humans		
Protein Capture Reagents		
Regenerative Medicine Program (RMP)		
Regulatory Science		
Science of Behavior Change		
Stimulating Peripheral Activity to Relieve Conditions (SPARC)		
Strengthening the Biomedical Research Workforce		
Transformative High-Resolution Cryo-Electron Microscopy		
Undiagnosed Diseases Network		

NIH National Institutes of Health
Office of Strategic Coordination - The Common Fund

Search Common Fund

Common Fund Programs Common Fund Research Funding News & Media Common Fund Highlights About Common Fund

The Human BioMolecular Atlas Program

Common Fund > Common Fund Programs > The Human BioMolecular Atlas Program

The Human BioMolecular Atlas Program

For the Public

- Public Health Relevance
- Strategic Planning

For Researchers

- NIH Working Group
- Meetings and Workshops

Program Snapshot

In organisms consisting of multiple cell types, diverse cells with different functions and structures develop as we grow and age. The organization and variability of these cells have a profound impact on the function of different tissues, process of aging, and emergence of diseases and conditions. Recently developed technologies are allowing researchers to explore cells on the individual (single cell) level and provide an opportunity to establish a census of cells in human tissues and to study functional interactions among single cells. The Human BioMolecular Atlas Program (HuBMAP) aims to facilitate research on single cells within tissues by supporting data generation and technology development to explore the relationship between cellular organization and function, as well as variability in normal tissue organization at the level of individual cells.

Connect with HuBMAP!

Learn about NIH HuBMAP funding opportunities, news, and resources as they become available by signing up for the HuBMAP listserv here.

HuBMAP at ASCB 2017

NEW! HuBMAP, Chan Zuckerberg Science, and the Royal Institute of Technology KTH are organizing a session at the American Society for Cell Biology, European Molecular Biology Organization, 2017 Meeting. This session, titled "Building a Multiscale, Multidimensional Human Cell Atlas", will include discussion of international programs that are supporting this community effort and some of the novel imaging approaches that will inform modeling of cellular organization and interactions in tissue environments. Learn more about this event here.

Tissue Acquisition and Metadata Standards Workshop

HuBMAP held a mini-workshop on June 28, 2017, in Rockville, MD. The purpose of the workshop was to identify challenges in collecting, preserving, and annotating high quality human tissue for downstream analytical techniques. Learn more about this workshop here [pdf](#).

HuBMAP
The Human BioMolecular Atlas Program

Engineering-specific
Team-Based De

“Got idea?” Find NIH funding opportunities!

Google: “NIH funding opportunities”



The image shows a screenshot of the NIH Office of Extramural Research website. The page is titled "Grants & Funding" and features a navigation menu with "HOME", "ABOUT GRANTS", "FUNDING", "FORMS & DEADLINES", and "GRANTS". The "FUNDING" tab is selected. The main content area is titled "Funding Opportunities and Notices" and includes a search bar, a list of funding opportunities, and a section for "Browse Active Funding Opportunities". A red rotary phone is overlaid on the right side of the page. Several items in the left sidebar are circled in red: "Funding Opportunities (RFAs, PAs) & Notices", "Unsolicited Applications (Parent Announcements)", "Research Training & Career Development", "Small Business (SBIR/STTR)", "Contract Opportunities", "New and Early Stage Investigators", and "NIH Reports (RePORT) Search NIH Awards (RePORTER)".

NIH National Institutes of Health
Office of Extramural Research

HOME ABOUT GRANTS **FUNDING** FORMS & DEADLINES GRANTS

Grants & Funding

Funding Opportunities

- Funding Opportunities (RFAs, PAs) & Notices
- Unsolicited Applications (Parent Announcements)
- Research Training & Career Development
- Small Business (SBIR/STTR)
- Contract Opportunities

NIH-Wide Initiatives

- New and Early Stage Investigators
- Stem Cell Information
- NIH Common Fund
- OppNet (Behavioral & Social Sciences)

Award Data

- NIH Reports (RePORT) Search NIH Awards (RePORTER)

Funding Opportunities and Notices

The NIH Guide for Grants and Contracts is the official medical and behavioral research grant policies, guidelines, and opportunities. Definitions and More Information...

Search the NIH Guide for:

- Active RFAs (Requests for Applications)
- Active PAs (Program Announcements)
- Notices

With Announcement # or Keywords (Optional)

Advanced Search

Browse Active Funding Opportunities

- Requests for Applications (RFAs)
- Program Announcements (PAs)
- Parent Announcements (unsolicited applications)

Browse Recent Policies and Guidelines Notices

HHS OIG Hotline
REPORT FRAUD
oig.hhs.gov

NIH RePORT

U.S. Department of Health & Human Services

Printer Friendly | Text Size A A A

NIH Research Portfolio Online Reporting Tools
(RePORT)

Search

HOME | ABOUT RePORT | FAQs | GLOSSARY | CONTACT US

QUICK LINKS RESEARCH ORGANIZATIONS WORKFORCE FUNDING REPORTS LINKS & DATA

Patents
Projects
Publications
Data Visualize
Map
Links
History
Subprojects

The RePORT Expenditures and Results Tool (RePORTER)

Search a repository of NIH-funded research projects and access publications and patents resulting from that funding.

RePORTER
CLICK TO VIEW

AWARDS BY LOCATION

NIH DATA BOOK

FUNDING FACTS

CATEGORICAL SPENDING

REPORT CATALOG

SPECIAL REPORTS

ABOUT REPORT

Research Portfolio Online Reporting Tools (RePORT)

In addition to carrying out its scientific mission, the NIH exemplifies and promotes the highest level of public accountability. To that end, the Research Portfolio Online Reporting Tools provides access to reports, data, and analyses of NIH research activities, including information on NIH expenditures and the results of NIH

NIH RePORTER [ADVANCED SEARCH](#)

Institute/Center: Fiscal Year: Principal Investigator:
 (Last Name, First Name)

<http://report.nih.gov/>

Identify Areas Where NIH Would Like To See More Research Initiatives -> Solicitations (Funding Opportunity Announcements)

Opportunity Type	Set Aside Funds	Special Review
Request for Applications (RFA) grant applications	Yes	IC
Request for Proposals (RFP) Contract proposals	Yes	IC
Program Announcements (PA)	No	No
Program Announcement with Review (PAR)	No	Yes
Program Announcement with Set Aside (PAS)	Yes	Yes

Resources To Help Get Started With A Translational Research Project: NHLBI Repositories



([BioLINCC](https://biolincc.nhlbi.nih.gov/home/)) <https://biolincc.nhlbi.nih.gov/home/>

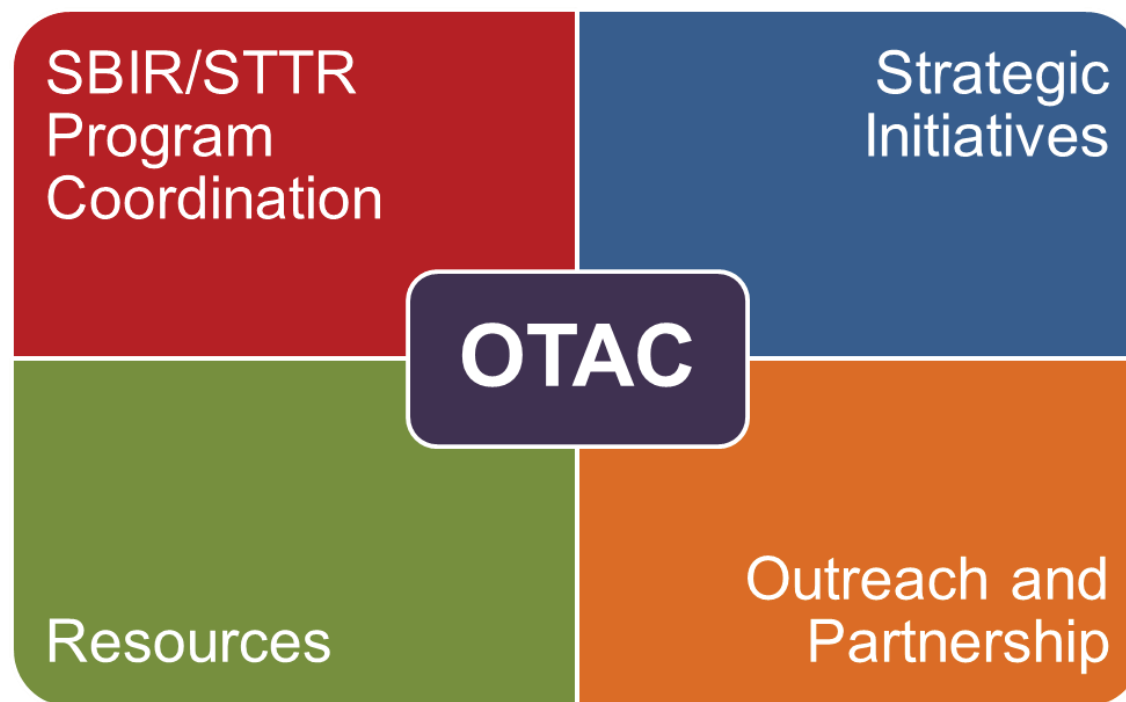
- Clinical Trials (N = 88)
- Observational Epidemiology Studies (N = 34)

Search website for specimens/data of interest and apply directly on the website

New Investigators!!

SBIRs: NHLBI Office of Translational Alliances and Coordination (OTAC)

Charge: Develop and implement initiatives to enhance translation of technologies from the bench to the market



Lab to Market for Health

NHLBI SBIR-supported Products

CoaguChek®
Because it's my life



MENSSANA
RESEARCH, INC.

Heartsbreath™ Heart
Transplant Rejection point-
of-care breath test



THORATEC
CORPORATION



THERMEDICAL

SERF Ablation System



Life Recovery Systems

The FASTEST non-invasive cooling in the world of medicine.



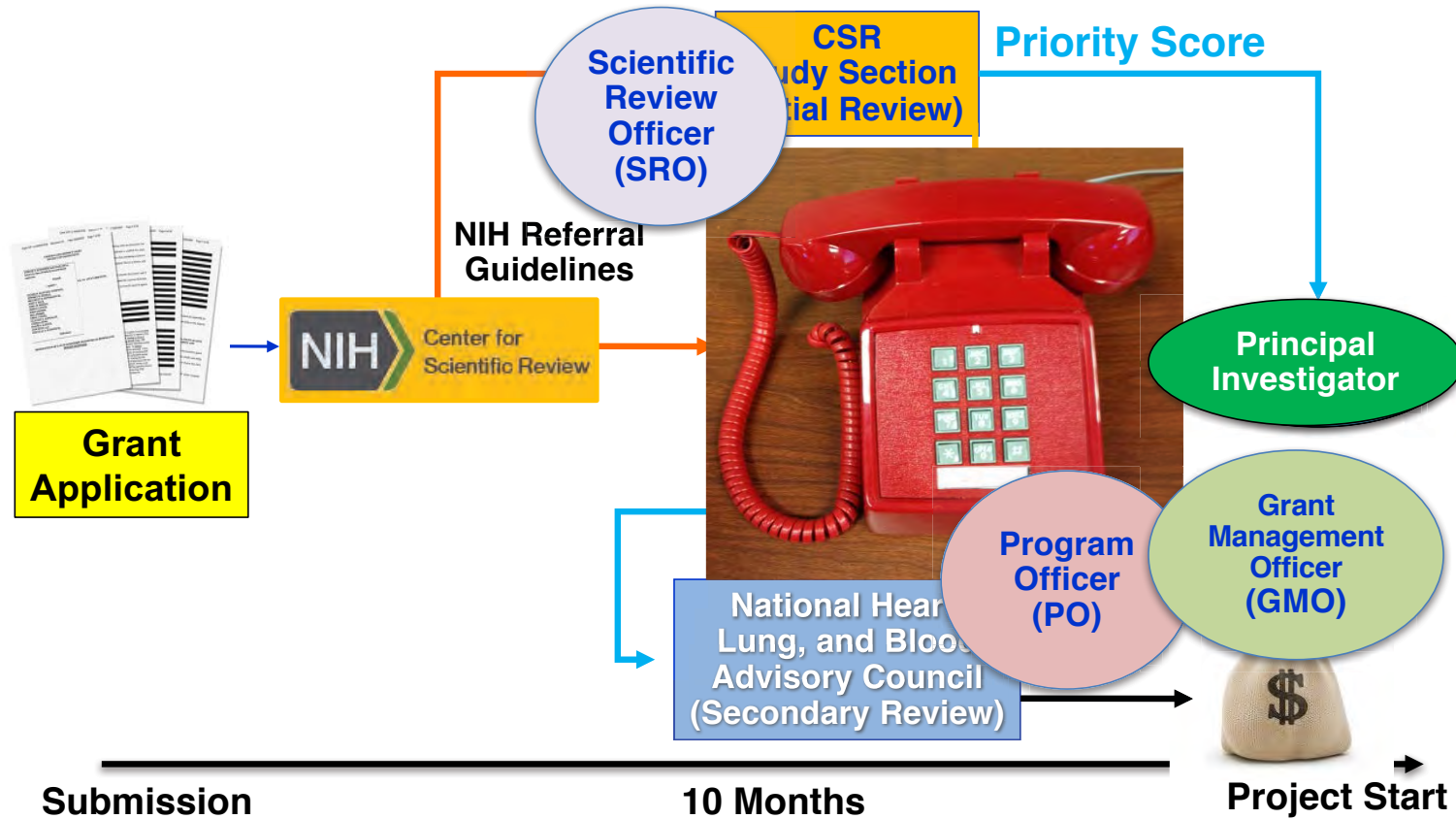
ThermoSuit



alphacore
pharma

“What happened to my NIH grant application?”

(“Simplified path” for Investigator-Initiated research application)



Thanks: Dr. Melissa Antman



Science is a team sport!

When in doubt.... Google us!

- **NIH Guide**
<http://grants.nih.gov/grants/guide/index.html>
- **Research Portfolio Online Reporting Tools (RePORT)**
<http://report.nih.gov/>
- **NHLBI webpage:** www.nhlbi.nih.gov
- **Research Portfolio Online Reporting Tools (Re-PORTER)**
- **NIH Matchmaker**
https://projectreporter.nih.gov/reporter_matchmaker.cfm



The background features a dark grey area with a pattern of question marks in various shades of gold and grey. A semi-transparent grey rectangle is centered over this area, containing the text. Above the main content area, there is a dark grey horizontal bar with a red stripe on top and a hexagonal pattern on the right side.

DISCUSSION & NEXT STEPS

DESIGN your application for the NIH peer-review process (competitive ranking)

- **Peer Review Criteria:**
 - ✓ **Significance (of proposed research): “*Why?*”**
 - ✓ **Investigator(s) (applicants): “*Who?*”**
 - ✓ **Innovation (of research question/approach): “*What?*”**
 - ✓ **Approach (experimental design): “*How?*”**
 - ✓ **Environment (of where research will be performed): “*Where?*”**
- **Pay based on Ranking:** based on Priority score (10 to 90=worst), sometimes based on “percentile” score (1 to 100=worst)

“Congratulations: *You got funded!*”

PI: “OK, can I relax now?”

Important Reminders about NIH Awards

- The award is made to an institution, not an individual
- The NIH “Notice of Award” includes acceptance terms
- *Each publication, press release, or other document about research supported by an NIH award must include an acknowledgment of NIH award support and a disclaimer such as “Research reported in this publication was supported by the National Heart, Lung, And Blood Institute of the National Institutes of Health under Award Number R01HLXXXXX.”*
- Satisfactory progress report (yearly) and close-out report