NSF-NIH-ANR-BMBF-BSF Joint Program

Collaborative Research in Computational Neuroscience

http://www.nsf.gov/crcns

- Computational neuroscience, inclusively defined

  encompassing many approaches and goals; related to biological processes; disease and normal function; theory, modeling, and analysis; implications for biological and engineered systems

- ***Innovative, collaborative, and interdisciplinary***

  to make significant advances on important hard problems, and to develop new research capabilities

The program considers **Research Proposals** describing collaborative projects that bring together complementary expertise on interdisciplinary challenges; and **Data Sharing Proposals** to support preparation and deployment of data and other resources, in a manner that responds to the needs of a broad community.

Opportunities for ***parallel international funding*** (Germany, France, Israel, and multilateral). Next deadline: December 19, 2016

Top 10 differences between NIH and NSF

- Health mission
- Clinical relevance can be part of the science
- Standardized deadlines and mechanisms
- Faster feedback
- You adapt to a given panel
- Scores, percentiles
- Typically more risk-averse

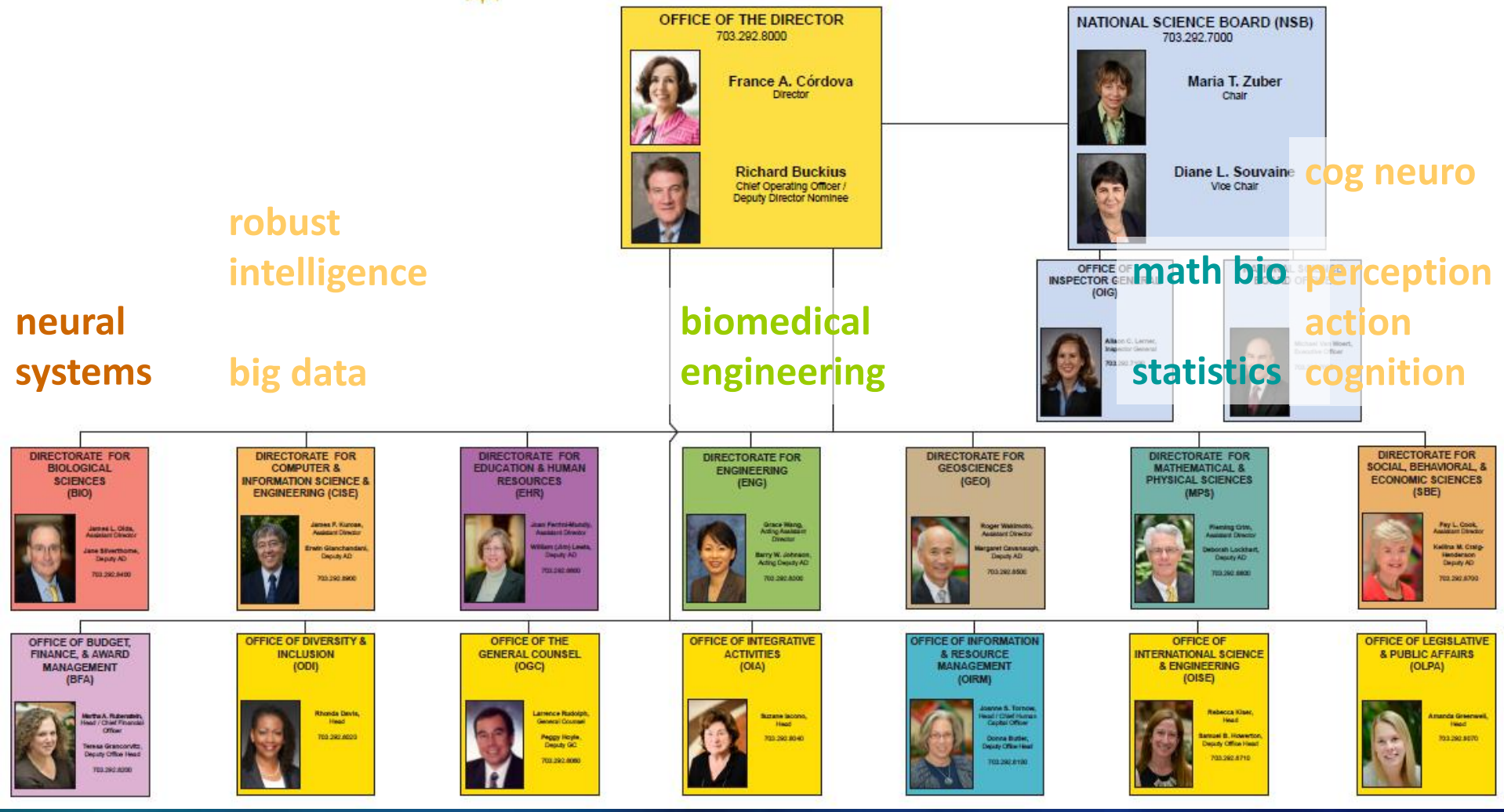
- Science mission
- Clinical relevance can be a broader impact
- Every program is different
- Six months of anxiety
- Panel adapts to you; can co-review
- Panel is advisory
- Typically less risk-averse

Top 10 differences between NIH and NSF

- Can fund foreign institutions
- Mostly career staff
- Usually larger budgets

- Foreign funding very limited
- Career and rotators
- "**NSF**"

NATIONAL SCIENCE FOUNDATION



BRAIN Initiative Foci and Programs

Thematic areas

- Multi-scale Integration of the dynamic activity and structure of the brain
- Neurotechnology and research infrastructure
- Quantitive theory and modeling of brain function
- Brain-Inspired concepts and designs
- BRAIN Workforce Development

Funding Opportunities

- Developing a National Research Infrastructure for Neuroscience (NeuroNex)
- Integrative Strategies for Understanding Neural and Cognitive Systems (NCS)
- International Collaboration Opportunities related to the NSF Investments in Understanding the Brain

http://nsf.gov/brain

Next Generation Networks for Neuroscience (NeuroNex)

Neurotechnology Hubs

- innovative research resources, instrumentation, and neurotechnologies
- immediate or near-term need
- demonstrate scalability to serve a substantial and expandable number of users
- technologies, instrumentation, tools

Letters of Intent: September 2

Proposal Deadline: October 21

Theory Teams

- theoretical frameworks for understanding brain function across organizational levels, scales of analysis, and/or a wider range of species, including humans.
- advance theoretical (including evolutionary) frameworks in neuroscience
- enhance integration of analyzed data across temporal, spatial, and/or biological scales of analysis.

questions: Sri and Floh

Integrative Strategies for Understanding Neural and Cognitive Systems (NCS)

http://nsf.gov/ncs/ (CISE, EHR, ENG, SBE)

Emphasis on ***transformative, integrative approaches*** to tackle previously intractable challenges. Must advance foundations of one or more of:

Neuroengineering and Brain-Inspired Concepts and Designs

Individuality and Variation

Data-Intensive Neuroscience and Cognitive Science

Cognitive and Neural Processes in Realistic, Complex Environments

INTEGRATIVE FOUNDATIONS (500K-1M, 2-4 yrs); **CORE+ SUPPLEMENTS** (CISE, EHR, ENG) to connect new or existing projects to neural and cognitive systems

questions: Michele and Ken

CISE Division of Advanced Cyberinfrastructure (ACI)

Innovative Computational Infrastructure for Understanding the Brain

DCL 16-076 Goals

- ***Accelerate and revolutionize the neuroscience discovery process*** through innovations in cyberinfrastructure.
- ***Foster strong collaborations*** between cyber developers and neuroscience researchers.
- ***Build on existing cyberinfrastructure***, fostering a national neuroscience infrastructure, and complement other NSF Understanding the Brain (UtB) & BRAIN Initiative efforts.

Funded projects

- Six Awards, ~$1.5 Million over 2-years, advancing the capability and performance of neuroscience analysis workflows in brain imaging, cognitive neuroscience, cellular imaging, connectomics.
- HPC Collaborations supported
- Aligned with both the BRAIN Initiative & National Strategic Computing Initiative (NSCI)

Open Data Ecosystem for Neuroscience

workshop July 25-26, 2016

what could we discover?

- Mapping of Human Cognition
- Faithful, Scale-Invariant and Species-Translatable Models of Neural Functions
- Applied, Personalized Models of Human Health.

what do we need to do?

- Improve **Sustainability** of data, code, experiments
- Increase **Incentives** for datasharing
- Enhance **Discoverability** of data and code
- Cross-cutting challenges

chaired by Brian Litt, Zack Ives, Fritz Sommer, Russ Poldrack

participating agencies: NSF, NIH, DARPA, IARPA, DOE, OSTP

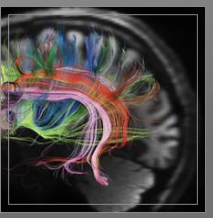
NSF envisions a connected portfolio of transformative, integrative projects that create synergistic links across investigators and communities, yielding novel ways of tackling the challenges of understanding the brain in action and in context.

scientific frontiers

technology

infrastructure

larger-scale collaboration




NIH Opportunities for Computational Neuroscience

Andrew Rossi, Ph.D.

Executive Functions Program

Division of Neuroscience and Basic Behavioral Science, NIMH

CRCNS Investigators Meeting
October 25, 2016

National Institute of Mental Health

Theoretical and Computational Neuroscience Program

Division of Neuroscience and Basic Behavioral Science, NIMH

Overview

This Program supports empirical and theoretical studies of self-organizing behavior in neuronal systems, mathematical approaches to modeling non-stationary neuronal processes, functional imaging of dynamical systems, and the modeling of all levels of neuronal processing, from single cell activity to complex behaviors.

Projects typically combine mathematical and computational tools with neurophysiological, neuroanatomical, or neurochemical techniques in order to decipher the mechanisms underlying specific neuronal and behavioral systems.

Program Contact: Dr. Michele Ferrante
michele.ferrante@nih.gov

Areas Supported

Cell / Membrane / Synaptic / Circuit Dynamics
Sleep
Temporal Processing
Learning and Memory
Social behavior
Decision Making
Theory
Network modeling

NEW

For more information please contact Dr. Michele Ferrante

michele.ferrante@nih.gov

NIH Innovation Awards

- **NIH Director's Pioneer Award**
  RFA-RM-16-005 (FY17 competition closed)

- **NIH Transformative Research Award**
  RFA-RM-16-007 (FY17 competition closed)

- **NIH Director's New Innovator Award**
  RFA-RM-16-004 (FY17 competition closed)

- **NIH Director's Early Independence Award**
  RFA-RM-16-006 (FY17 competition closed)

- **NIMH Biobehavioral Research Awards for Innovative New Scientists (BRAINS)**
  RFA-MH-15-600 (FY17 competition closed)

https://commonfund.nih.gov/highrisk/index

Multiscale Modeling (MSM) Mission

- Encourage multiscale modeling in biomedical, biological and behavioral systems
- Promote multidisciplinary scientific collaboration
- Support future generations of multiscale modelers
- Move the field of biological computational modeling towards:
    - predictive models of biology, health and disease
    - bioenergy and bioremediation
    - biomimetics
- Develop accurate methods and algorithms to cross the interface between multiple spatiotemporal scales
- Promote model sharing and the development of reusable multiscale models
- Disseminate the models and insights arrived from the models to the larger biomedical, biological, and behavioral research community

http://www.imagwiki.nibib.nih.gov/

Interagency Modeling and Analysis Group

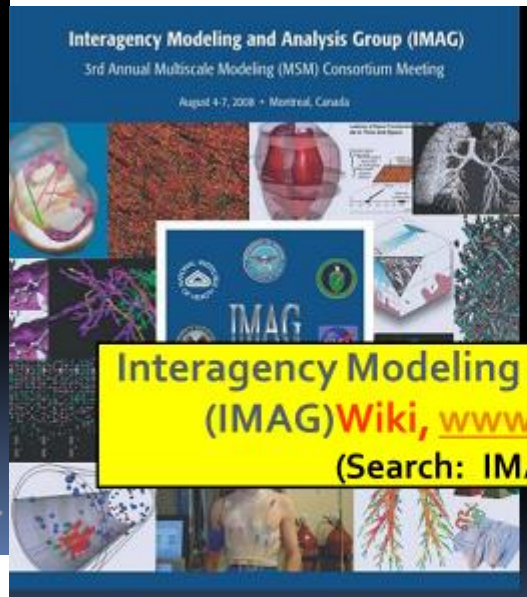
IMAG

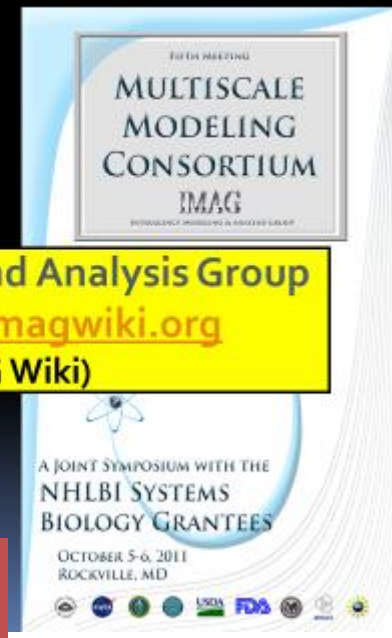
MULTISCALE MODELING FUNDING OPPORTUNITY
PAR 15-085

Predictive Multiscale Models for Biomedical, Biological, Behavioral, Environmental and Clinical Research (U01)

- Promoting the next generation cutting edge multiscale models – think out of the box
- 7 Participating Agencies: NIH, ARO, DOE, FDA, NASA, NSF, and ONR
  - 22 Funding Components
- 9 receipt dates until: September 29, 2017
- Cooperative Agreement allows investigators to contribute funded efforts to the MSM Consortium

IMAG





Interagency Modeling and Analysis Group (IMAG)Wiki, www.imagwiki.org
(Search: IMAG Wiki)

Come attend the 10th Anniversary Celebration of the Multiscale Modeling Consortium!
March 22-24, 2017 Bethesda, MD

BD2K: Big Data to Knowledge

BD2K Mission Statement:

BD2K is a trans-NIH initiative established to enable biomedical research as a digital research enterprise, to facilitate discovery and support new knowledge, and to maximize community engagement. There are four major aims:

- To facilitate broad use of biomedical digital assets by making them discoverable, accessible, and citable.
- To conduct research and develop the methods, software, and tools needed to analyze biomedical Big Data.
- To enhance training in the development and use of methods and tools necessary for biomedical Big Data science.
- To support a data ecosystem that accelerates discovery as part of a digital enterprise.

https://datascience.nih.gov/bd2k/

National Institute of Mental Health

BD2K: Big Data to Knowledge

Data Science Home / All Research Funding Announcements

TITLE	NUMBER	OPENING DATE	CLOSING DATE	STATUS
BD2K Support for Meetings of Data Science Related Organizations (U13)	RFA-CA-16-020	11/15/2016	12/15/2016	Open
Big Data to Knowledge (BD2K) Enhancing the Efficiency and Effectiveness of Digital Curation for Biomedical Big Data (U01)	RFA-LM-17-001	11/15/2016	12/15/2016	Open

https://datascience.nih.gov/bd2k/

National Institute of Mental Health

BD2K: Big Data to Knowledge

Enhancing Training

TITLE	NUMBER	OPENING DATE	CLOSING DATE	STATUS
BD2K Research Education Curriculum Development: Data Science Overview for Biomedical Scientists (R25)	RFA-ES-16-011	11/07/2016	12/07/2016	Open
NIH Big Data to Knowledge (BD2K) Enhancing Diversity in Biomedical Data Science (R25)	RFA-MD-16-002	10/14/2016	11/14/2016	Open

https://datascience.nih.gov/bd2k/

National Institute of Mental Health

BISTI: Biomedical Information Science and Technology Initiative

BISTI is a consortium of representatives from each of the NIH institutes and centers. BISTI was established in May 2000 to serve as the focus of biomedical computing issues at the NIH.

The mission of BISTI is to make optimal use of computer science and technology to address problems in biology and medicine by fostering new basic understandings, collaborations, and transdisciplinary initiatives between the computational and biomedical sciences.

In support of this mission, the BISTI coordinates research grants, training opportunities, and scientific symposia associated with biomedical computing. Regular monthly meetings are conducted to discuss program status, future needs and directions, and topics of interest to the bioinformatics community.

http://www.bisti.nih.gov/index.asp

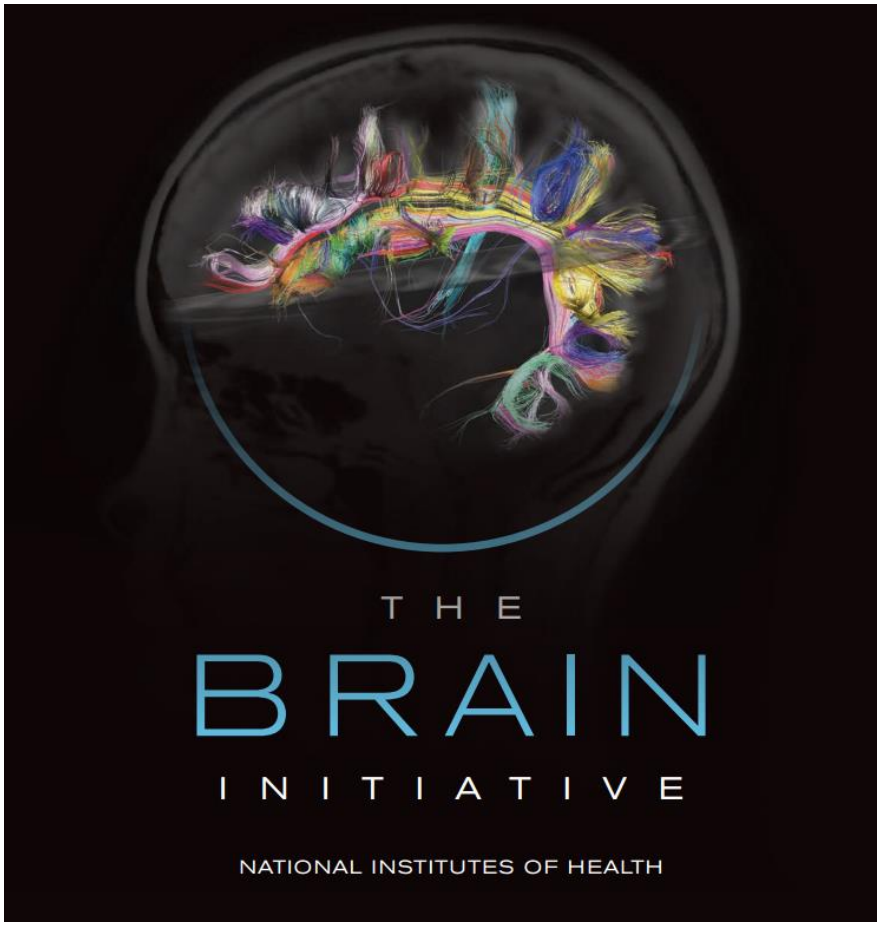
BISTI: Biomedical Information Science and Technology Initiative

BISTI > Funding > Funding Announcements

+ All Broad-based BISTI Initiatives

Title	Funding Number	Opening Date	Closing Date	Next Deadline
Early Stage Development of Technologies in Biomedical Computing, Informatics, and Big Data Science (R01)	PA-14-155	05/02/2014	05/08/2017	10/05/2016
Extended Development, Hardening and Dissemination of Technologies in Biomedical Computing, Informatics and Big Data Sciences (R01)	PA-14-156	05/05/2014	05/08/2017	10/05/2016
Early Stage Development of Technologies in Biomedical Computing, Informatics, and Big Data Science (R41/R42)	PA-14-157	07/05/2014	05/08/2017	01/07/2017

The BRAIN Initiative



"Rigorous theory, modeling, and statistics are advancing our understanding of complex, nonlinear brain functions where human intuition fails. New kinds of data are accruing at increasing rates, mandating new methods of data analysis and interpretation. To enable progress in theory and data analysis, we must foster collaborations between experimentalists and scientists from statistics, physics, mathematics, engineering, and computer science."

-BRAIN Working Group Report to the Advisory Committee to the Director, NIH June 5, 2014

The BRAIN Initiative

RFA-MH-17-220
Development and Validation of Novel Tools to Analyze Cell-Specific and Circuit-Specific Processes in the Brain
Contact Email: BRAIN-info-NIMH@mail.nih.gov

RFA-MH-17-235
Foundations of Non-Invasive Functional Human Brain Imaging and Recording - Bridging Scales and Modalities
Contact Email: churchillj@mail.nih.gov

RFA-MH-17-255
Data Archives for the BRAIN Initiative
Contact Email: farberg@mail.nih.gov

RFA-MH-17-257
Integration and Analysis of BRAIN Initiative Data
Contact Email: farberg@mail.nih.gov

https://www.braininitiative.nih.gov/funding/index.htm

The BRAIN Initiative: Training Awards

RFA-MH-17-250
BRAIN Initiative Fellows: Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship
Contact Email: Nancy.Desmond@nih.gov

RFA-MH-17-022
Research Career Enhancement Award for Investigators to Build Skills in a Cross-Disciplinary Area
Contact Email: ghimm@mail.nih.gov

Graduate Student Training Opportunity

NIH Blueprint Training Grants in Computational Neuroscience

NIH Blueprint Training Grants in Computational Neuroscience

Integrated research training programs in basic neuroscience and the theoretical and technological approaches of computational neuroscience at the undergraduate and predoctoral level.

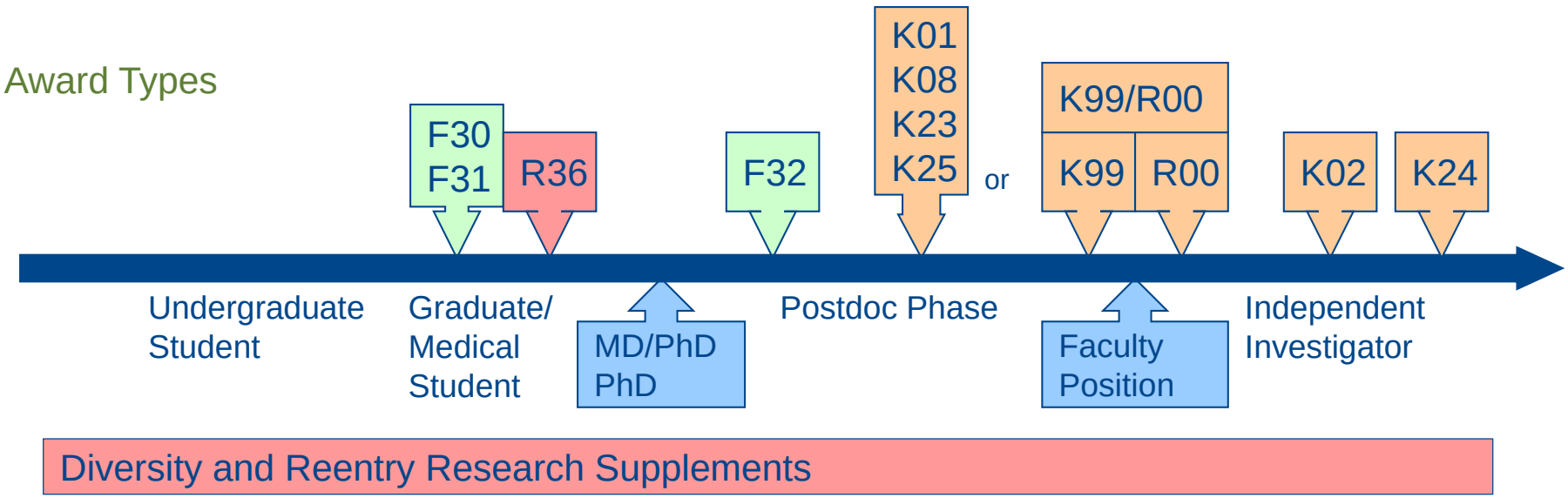
- Four sites recently funded for new 5-year project period
- Unique feature:
  - Programs support 3-4 predoctoral US citizens or permanent residents (NRSA eligible)
  - And 2 non-NRSA eligible predoctoral students (foreign students)
- **Sites:**

  Brandeis University, Program Director, Eve Marder
  Carnegie Mellon/Univ. of Pittsburgh, PDs: Robert Kass and Brent Doiron
  New York University, PDs Xiao-Jing Wang and Weiji Ma
  University of Washington, PDs Adrienne Fairhall and Eric Shea-Brown

- Contact the Program Directors for information on how to apply to their graduate programs or Susan Volman svolman@nida.nih.gov for further information.

NIH Blueprint for Neuroscience Research

NIMH Funding for Research Training Individual Awards



http://www.nimh.nih.gov/about/organization/dnbbs/office-of-research-training-and-career-development/index.shtml

CRCNS Conference 2016

Funding Opportunities

Collaborative Transnational Research Projects in Neurosciences

Sheyla Mejia-Gervacio PhD
October 2016

AGENCE NATIONALE DE LA RECHERCHE
ANR

ERANET NEURON III

Network of European Funding for Neuroscience Research

Transnational collaborative projects
(3 to 5 European countries + Canada + Israel *+ EC participation)
3 years funding
Yearly thematic calls on **basic research with translational value**

CALL 2016	Closed	***External Insults to the Nervous System***
	Austria, Belgium, Canada, France, Germany, Israel, Italy, Latvia, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Switzerland, Turkey and UK.	
CALL 2017	To be Launched December 2017	**TBA**

* Countries participating in each call can change

http://www.neuron-eranet.eu/

JPI JPND

EU Joint Program Neurodegenerative Disease Research

Transnational collaborative projects

(3 to 5 European countries + Canada + Israel + Australia *+ EC participation)

Joint calls on **translational research on Neurodegenerative disease** 3 years funding

CALL 2015 Closed ***A call for European research projects on neurodegenerative diseases: risk and protective factors, longitudinal cohort approaches and advanced experimental models***

Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Israel, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Turkey, UK

CALL 2017 To be Launched December 2017 **TBA**

Call for Working Groups Up to 12 months funding

CALL 2016 Closed ***Harmonisation and Alignment in Brain Imaging Methods for Neurodegeneration***

Canada, Denmark, France, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, UK

CALL 2017 or 2018 **TBC** **TBA**

CoEN pathfinder (aligned to JPND)

Network of Centers of Excellence in Neurodegeneration

Multilateral collaboration between members of Identified Centers of Excellence in Canada, Belgium, France, Germany, Ireland, Italy, Slovakia, Spain, and UK

Collaboration between Researchers from at least 2 CoEn
2 years funding
Proof of concept, Risky and Innovative scientific projects

CALL 2015	Closed	***New and unconventional approaches and creative solutions to the challenges of neurodegeneration research*** Canada, France, Germany, Ireland, Spain and UK
CALL 2017	**TBC**	**TBA**

http://www.coen.org/home.html

ERANET Flag-ERA II FET Flagship Human Brain Project

Transnational collaborative projects **aligned to HBP goals**
(3 partners from 3 member countries)

Joint transnational calls on **basic research and clinical/technological innovation** 3 years funding

CALL 2015	Closed	***Transnational research projects in synergy with the two FET Flagships Graphene Flagship and Human Brain Project*** Austria, Belgium, France, Hungary, Italy, Latvia, Netherlands, Portugal, Romania, Spain, Turkey
CALL 2017	**TBC**	**TBA**

HBP areas :Targeted Mapping of the Mouse Brain, Targeted Mapping of the Human Brain, Theoretical and Mathematical Foundations of Neuroscience, Neuroinformatics, Brain Simulation, High Performance Computing, Medical informatics, Neuromorphic Computing, Neurorobotics, Ethics and Society

https://www.flagera.eu/

International collaborative initiatives_ PRCi

Bilateral, Non specific

France-Germany

France-Austria

France-Switzerland

France-Brasil

http://www.agence-nationale-recherche.fr/

Thank you!

AGENCE NATIONALE DE LA RECHERCHE
ANR

NSF-BSF PROGRAMS STATISTICS - 2016

Discipline	2016			
	Submissions	**Grants**	**Success rate NSF-BSF**	**General NSF success rates**
Pre- integrative organismal systems (IOS)	40	12*	30%	25%
IOS	12			
Pre-Environmental Biology (DEB)	22	9*	40%	25%
DEB	10			
Molecular & cellular Biology (MCB)	36	4	11%	15%***
Oceanography**	20	5	25%	22%***
Earth Sciences	9	3	33%	20-25%
Physics	16	≥5 (1)	≥31%	
Materials	48	≥10 (2)	≥20%	15-20%
Computing and Communication Foundations (CCF)	17	≥6 (3)	≥35%	25%***
Electrical, Communications and Cyber Systems (ECCS)	11	3	27%	20%
Psychology**	13	6	46%	17%
0E0conomics**	2		0%	
Computational Neuroscience (CRCNS)	12	4	33%	15%
Ecology & Evolution of Infectious Diseases (EEID)	3	1	33%	13%
Energy for Sustainability	11	1	9%	14%***
Cyber Security	12	3	16.5%	16%
	272	≥51	≥24% without	IOS & DEB

*No. of pre-proposals invited to submit full proposals

** 2 rounds per year. Sown are numbers for the combined 2 most recent rounds.

*** based on past statistics

( ) number of applications still pending