



National Institute of
Neurological Disorders
and Stroke

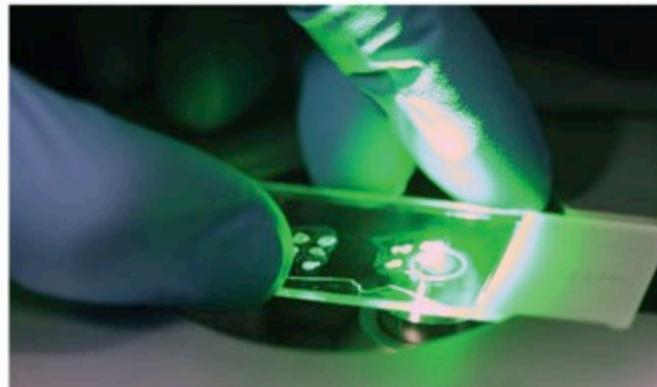
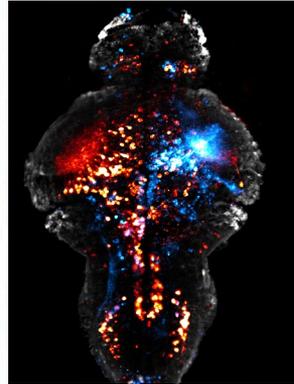
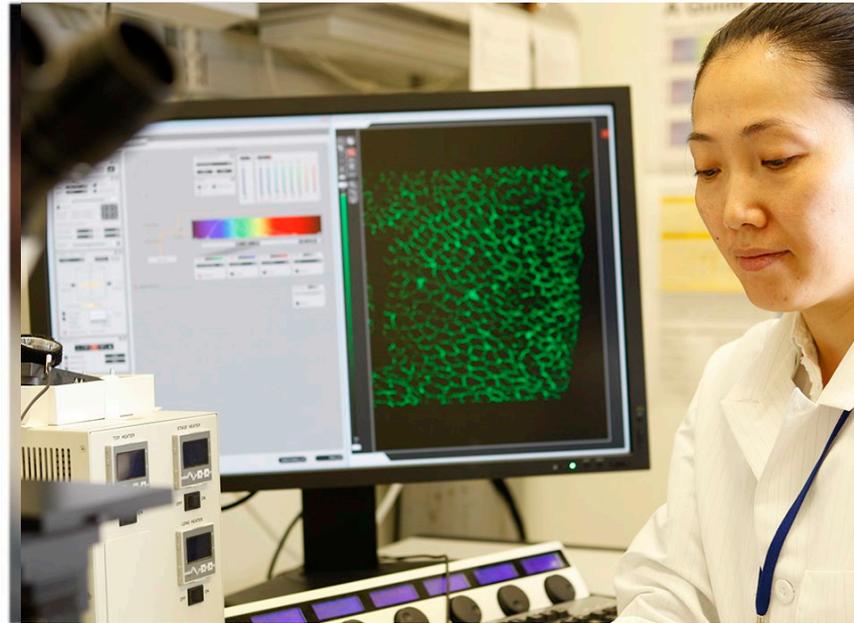
NINDS Director's Report

NANDS Council

May 23, 2019

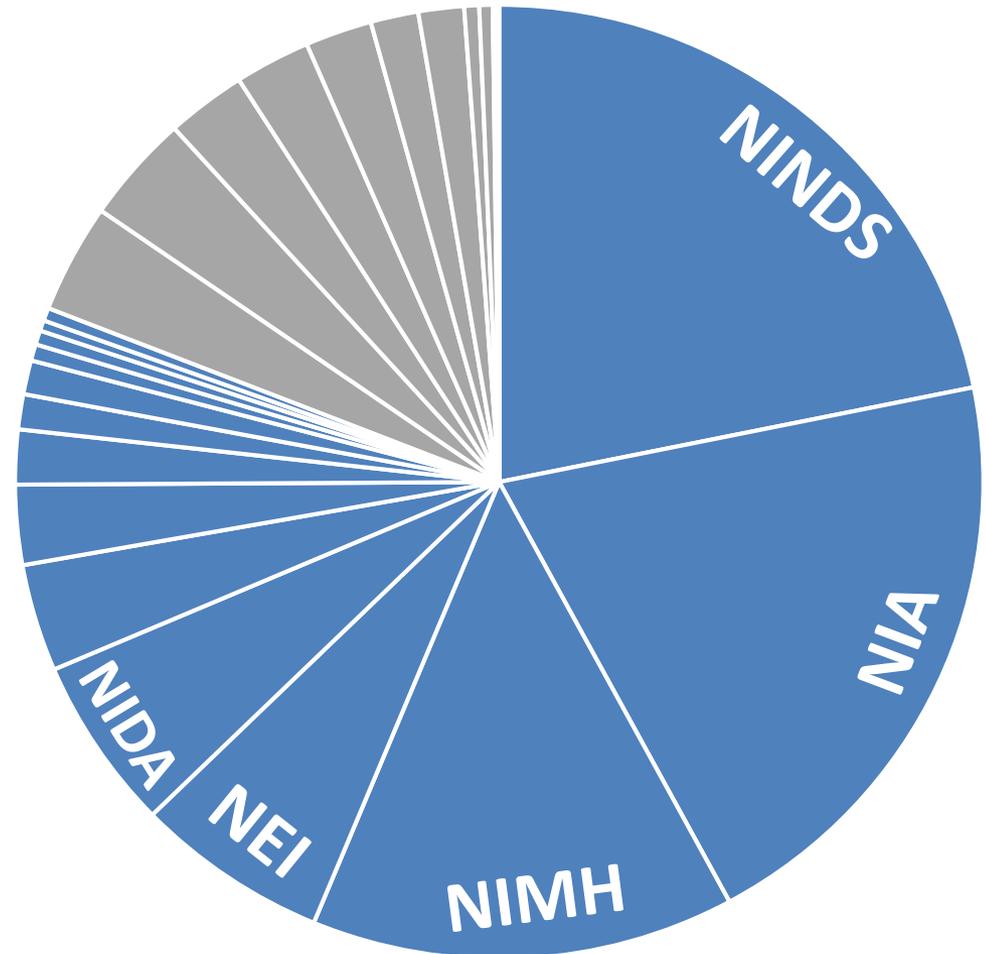
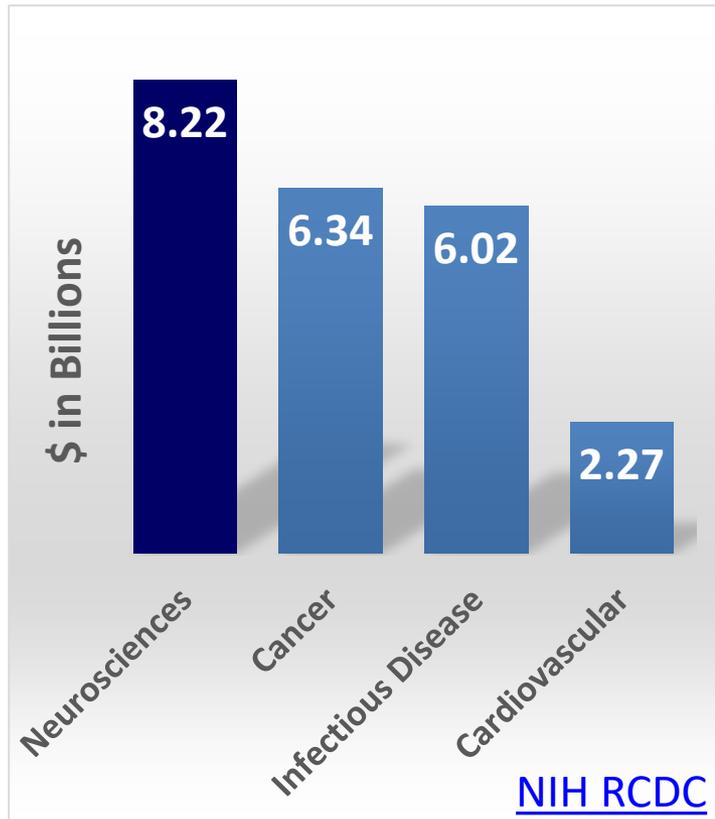
Nina Schor, M.D., Ph.D

Acting Director, National Institute of
Neurological Disorders and Stroke, NIH



NEUROSCIENCE IN 2018

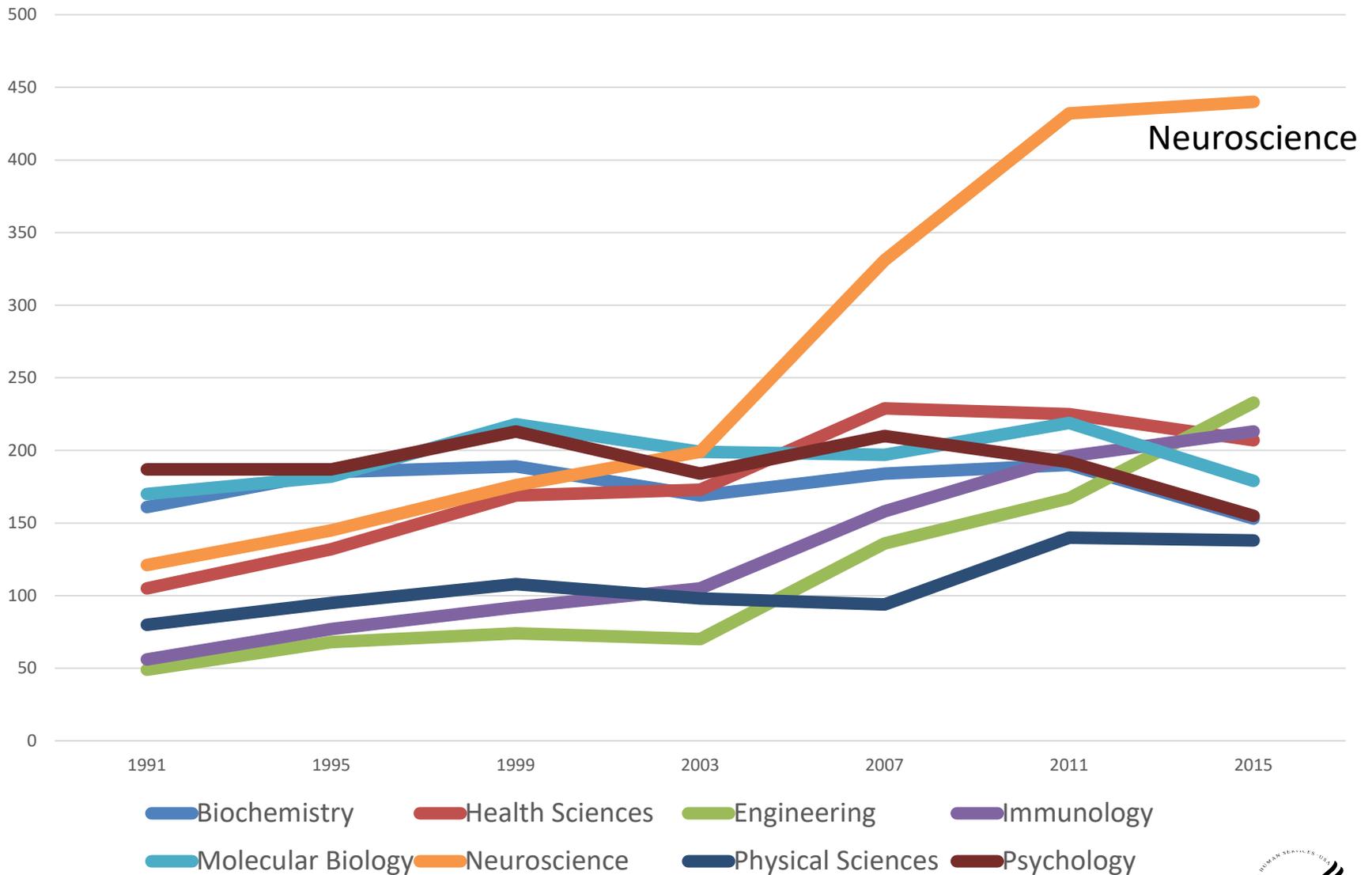
Neuroscience is Supported by NIH



Blueprint IC

Other IC

Neuroscience is Field of Choice for PhD Students



NIH FUNDING, 2015-2018

Appropriation History

(Dollars in Thousands)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019 Appropriation	FY 2020 President's Budget	FY 2020 House Mark
NINDS	1,604,607	1,692,833	1,778,688	1,888,130*	1,966,913*	\$1,706,031*	\$2,053,346*
NINDS % Change	1.0%	5.5%	5.4%	6.15%	4.17%	-13.3%	4.4%
NIH	30,311,349	32,345,549	34,161,349	36,228,080**	38,023,000**	\$33,375,629**	\$40,108,000**
NIH % Change	0.5%	6.7%	5.6%	6%	4.9%	-12.2%	5.5%

- NIH FY 2020 House Mark is a \$2 billion increase over FY 2019's level.
- In FY 2019, NINDS received \$250m for Pain Research in part of the HEAL Initiative and \$57.5m in CURES Act fund for the BRAIN Initiative.
- In FY 2019, NINDS will co-manage approximately \$170 million of the AD/ADRD monies that NIA received.

* These columns do not include the monies that NINDS received for the HEAL Initiative and CURES Act.

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OLD FRIENDS,

NEW FACES

Thank You for Your Service



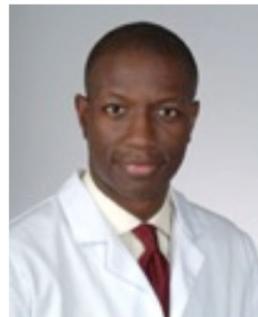
Gord Fishell, Ph.D.
*Professor of Neurobiology,
Harvard Medical School &
Stanley Center at the Broad
Institute*



Janet Hieshetter
*Executive Director, Dystonia
Medical Research Foundation*



Margie Frazier, Ph.D.
*Executive Director, Batten
Disease Support & Research
Association*



Bruce Ovbiagele, M.D.
*Professor of Neurology, UCSF
Associate Dean, San Francisco
VA Healthcare System
Chief of Staff, San Francisco VA
Healthcare System*

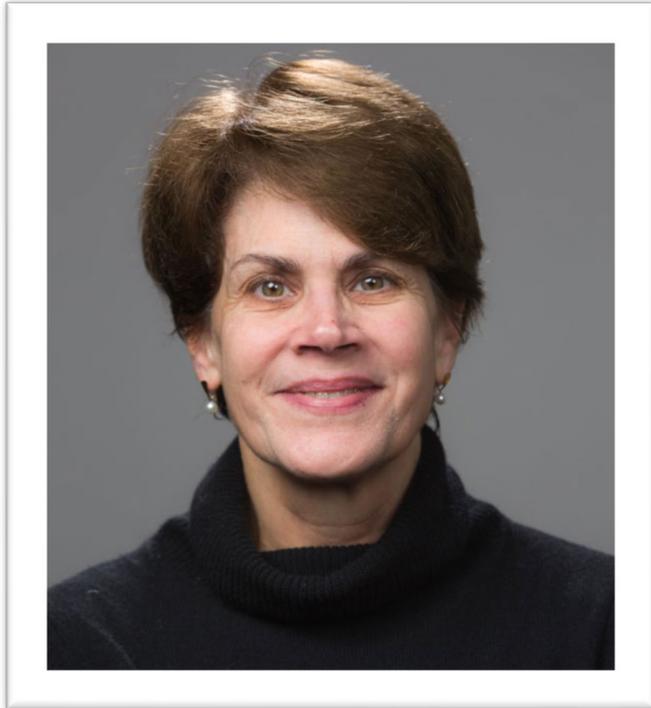


David Gutmann, M.D., Ph.D.
*Director, Washington University
NF Center, Donald O. Schnuck
Family Professor of Neurology*



Steve Perrin, Ph.D.
*President, CEO, Vice
Chairman, ALS Therapy
Development Institute*

NIDCD Director: Dr. Debara L. Tucci



Debara L. Tucci, M.D., M.S., M.B.A., to join NIH September 3, 2019

- Professor of Surgery at Duke University
- Director, Cochlear Implant Program in the Division of Head and Neck Surgery & Communication at Duke University
- Primary research interests focus on addressing barriers to hearing health care for older adults
- While at NIH, will continue her work to address hearing loss as a global public health problem in her role as co-chair of the Lancet Commission on Global Hearing Loss
- Distinguished Service Award from the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS)
- Education and Residency: University of Virginia

CRUCIAL ISSUES

NIH Efforts to Change the Culture to End Sexual Harassment

- NIH ACD Working Group charge includes:
 - Propose actions and policies to promote a safe and inclusive culture at NIH-supported conferences.
 - Suggest systemwide changes to culture and climate to prevent harassment and gender discrimination through diffusion of hierarchical environments by mentoring networks and committee-based advisement, and strong and diverse leadership.
 - Develop strategies for encouraging research on anti-harassment policies, procedures, and training; and measures and evaluations of their effectiveness.

NEWS · 28 FEBRUARY 2019

NIH revoked funding from 14 scientists over sexual harassment last year

The agency has faced sharp criticism over its handling of harassment allegations.

Sara Reardon

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NEWS · 16 MAY 2019

Harassment survivors demand stronger action by US biomedical agency

Women recounted their experiences at a meeting organized by the National Institut

NIH may bar peer reviewers accused of sexual harassment

By Jocelyn Kaiser | Mar. 27, 2019, 4:50 PM

Science
AAAS

PBS NEWS HOUR

Menu

Full

How NIH plans to fight the sexual harassment that could drive women away from science

Mar 6, 2019 6:35 PM EDT



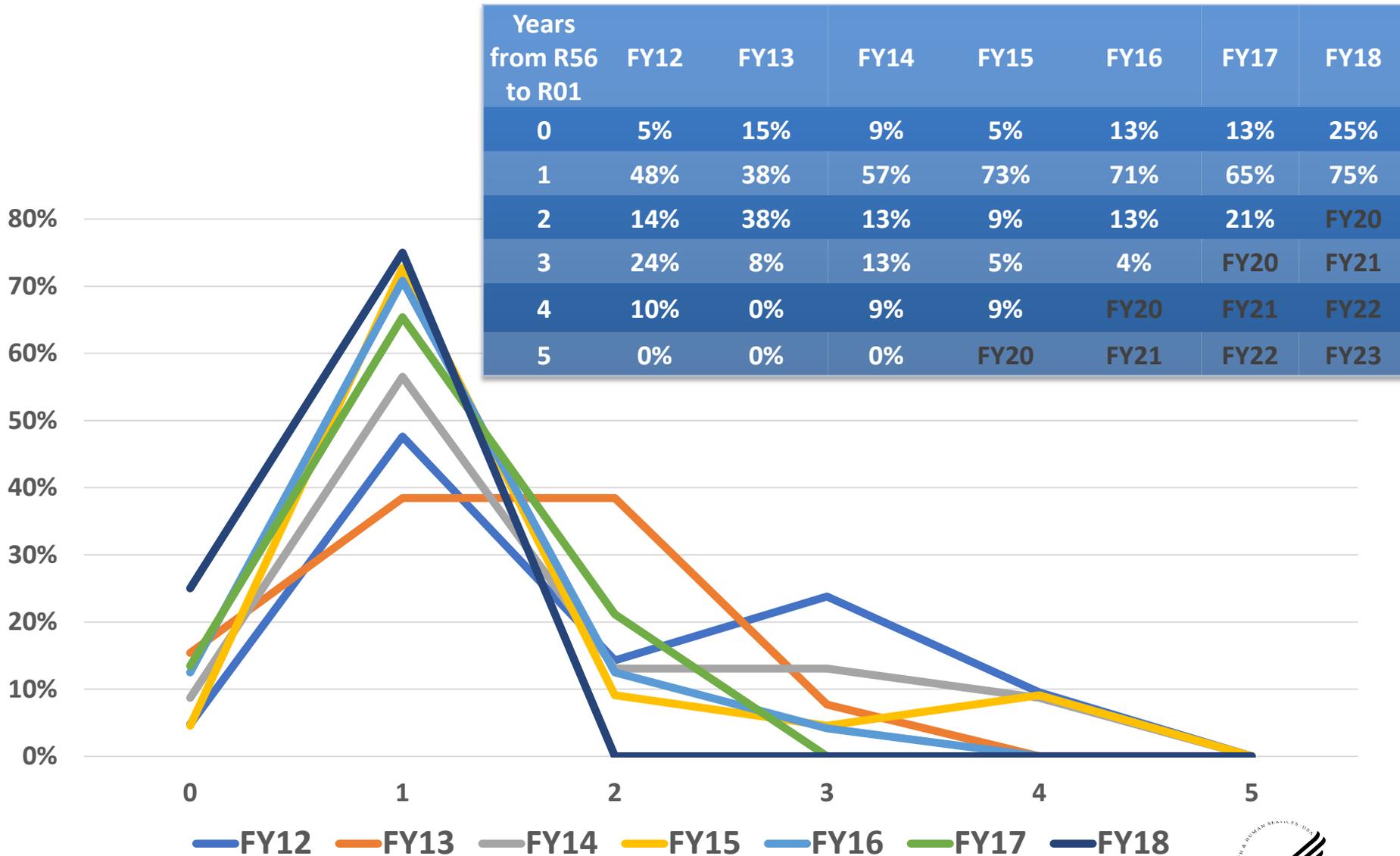
NIH ACD WG on the Next Generation Researchers Initiative (NGRI)

- Need to Identify and Support “At-Risk” Investigators and Early Stage Investigators = BRIDGE FUNDING
- Need to Promote Sustainable Training Opportunities that Incorporate Diversity and Inclusion = EARLY STAGE FUNDING AND PREVENTING NEW PI “DROPOUT”
- Need to Monitor Outcomes and Optimize Workforce Stability Through Improved Metrics And Further Research = LONGER-TERM FUNDING

Bridge Funding to R01 Award

FY (payline)	FY12 (15%)	FY13 (14%)	FY14 (14%)	FY15 (14%)	FY16 (15%)	FY17 (12%)	FY18 (15%)
Number of R56 awardees	34	24	44	34	40	81	30
Number of R56 awardees that applied for R01	31	21	39	32	38	75	26
% of R56 awardees that applied and successfully competed for an NS R01	68%	62%	59%	69%	63%	69%	46%
Bridge Funding (TC)	\$13.6M	\$10.5M	\$17.8M	\$13.3M	\$15.3M	\$29.1M	\$11.3M

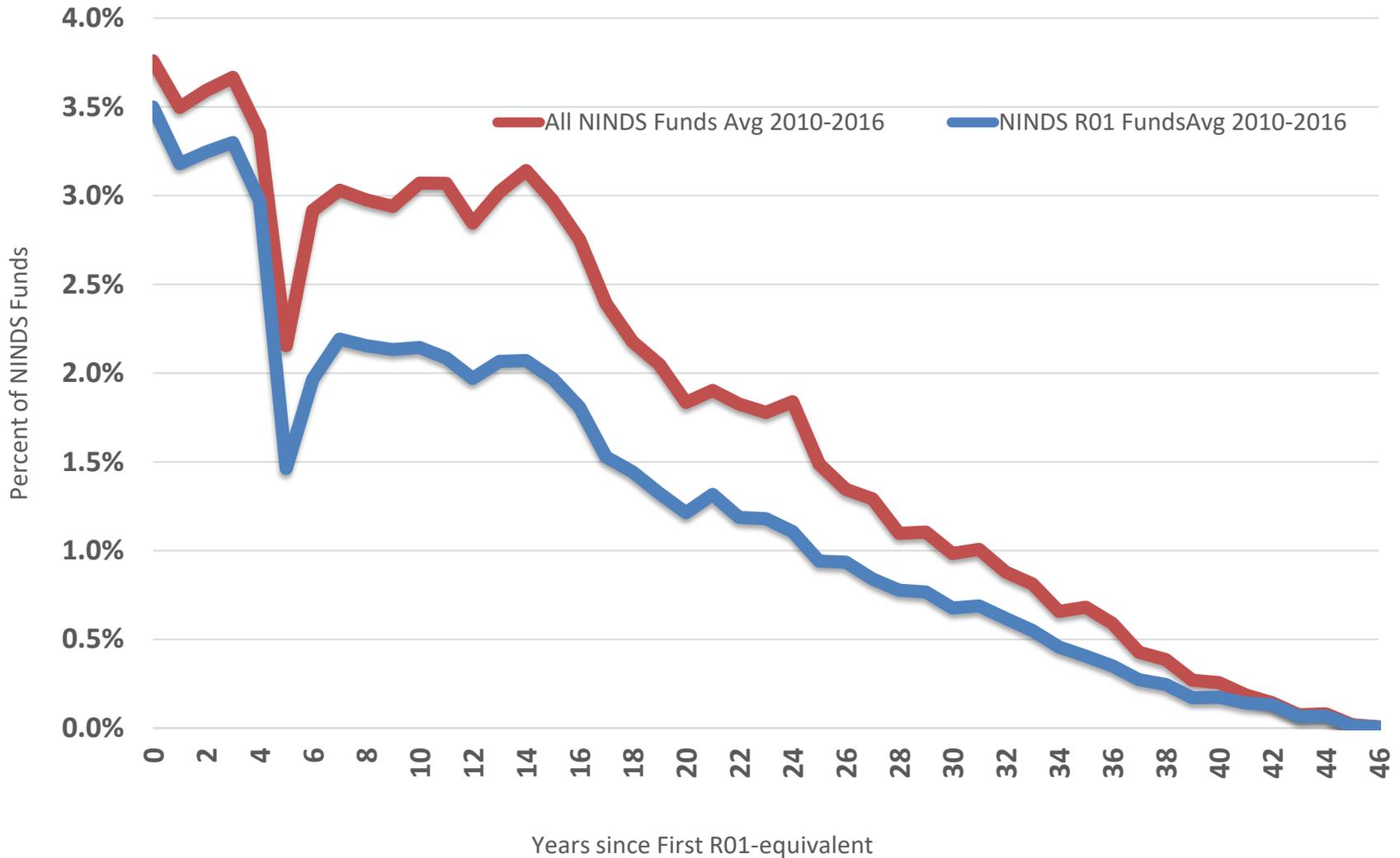
Bridging to an R01 in 1-2 Years



NINDS Commitment to Early Stage Investigators

FY (payline)	FY12 (15%)	FY13 (14%)	FY14 (14%)	FY15 (14%)	FY16 (15%)	FY17 (12%)	FY18 (15%)
Number of ESI awardees	60	58	49	80	80	61	93
Number of ESI awardees above NINDS payline	24	28	21	36	35	34	28
% of ESI applications paid to 25% tile	88%	93%	87%	98%	98%	95%	98%
ESI Funding (TC) for applications above the payline	\$8.1M	\$9.8M	\$7.1M	\$12.9M	\$13.0M	\$13.3M	\$10.8M

Off to a Good Start ... Then What?



Engaging Early Stage Investigators in Review



NINDS makes an active effort to include Early Stage Investigators in the review process

During FY 2015-2019 NINDS recruited 141 ESI's out of 5089 total reviewers (2.8%)

How we find them:

- Direct inquiries from ESI's interested in serving on review panels (eg. recent K-awardees)
- Suggestions or referrals from Program Directors, study section members
- Identified through our regular recruitment searches

NINDS Landis Award for Outstanding Mentorship

- NINDS launched program in 2018
- Recognizes **faculty members who have shown dedication to superior mentorship and training** in neuroscience research
- Awardees receive \$100,000 (direct costs) to support efforts in fostering the career advancement of additional trainees
- Candidates from 3 different career stages will be considered in different years. The 2020 cycle will recognize **Senior Faculty**



**Watch for the opening of the
2020 nomination cycle!**

Contact

[Stephen Korn, Ph.D.](#)
Director, Office of Training and
Workforce Development
korns@ninds.nih.gov 

NINDS Research Program Award (R35)



- ❖ Goal: Create a stable funding environment for outstanding investigators in order to facilitate longer-range, bolder, higher-risk research
- ❖ Award
 - 8 years/up to \$750,000/year direct cost
 - Checkpoint at year 5 with opportunity to request budget increase – NOT coming soon)
 - Requires at least 50% research effort
 - With limited exception, PI's only NINDS grant
- ❖ New Funding Opportunity coming soon:
 - Applications due Summer 2019
 - Mindful of creating a diverse award cohort

NINDS R35 Program

FY (payline)	FY16/17 (15%/12%)	FY18 (15%)	FY19 (16%)
FOA	NS16-001	NS17-020	NS18-032
Number of R35 Applications	195	43	84
Number of R35 Awards	3 / 27	8	16
R35 Award Rate	15%	19%	19%
R35 Funding (TC) <i>Does not account for savings from R35 offsets</i>	\$2.9M / 20M	\$4.3M	\$11.5M

WHAT'S NEW?

NIH Helping to End Addiction Long-term (HEAL) Initiative

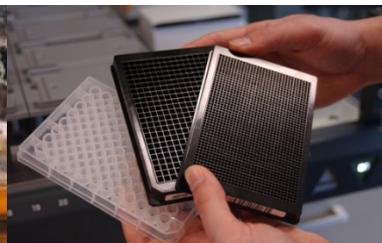
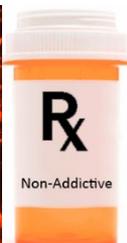
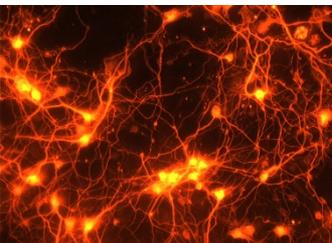
Congress appropriates \$500M/year to:

- Address opioid misuse and addiction
- **Enhance pain management:**
 - Understand biological underpinnings of chronic pain
 - Accelerate discovery and pre-clinical development of non-addictive treatments
 - Advance new non-addictive treatments through the clinical pipeline
 - Establish the best pain management strategies for acute pain and numerous chronic pain conditions

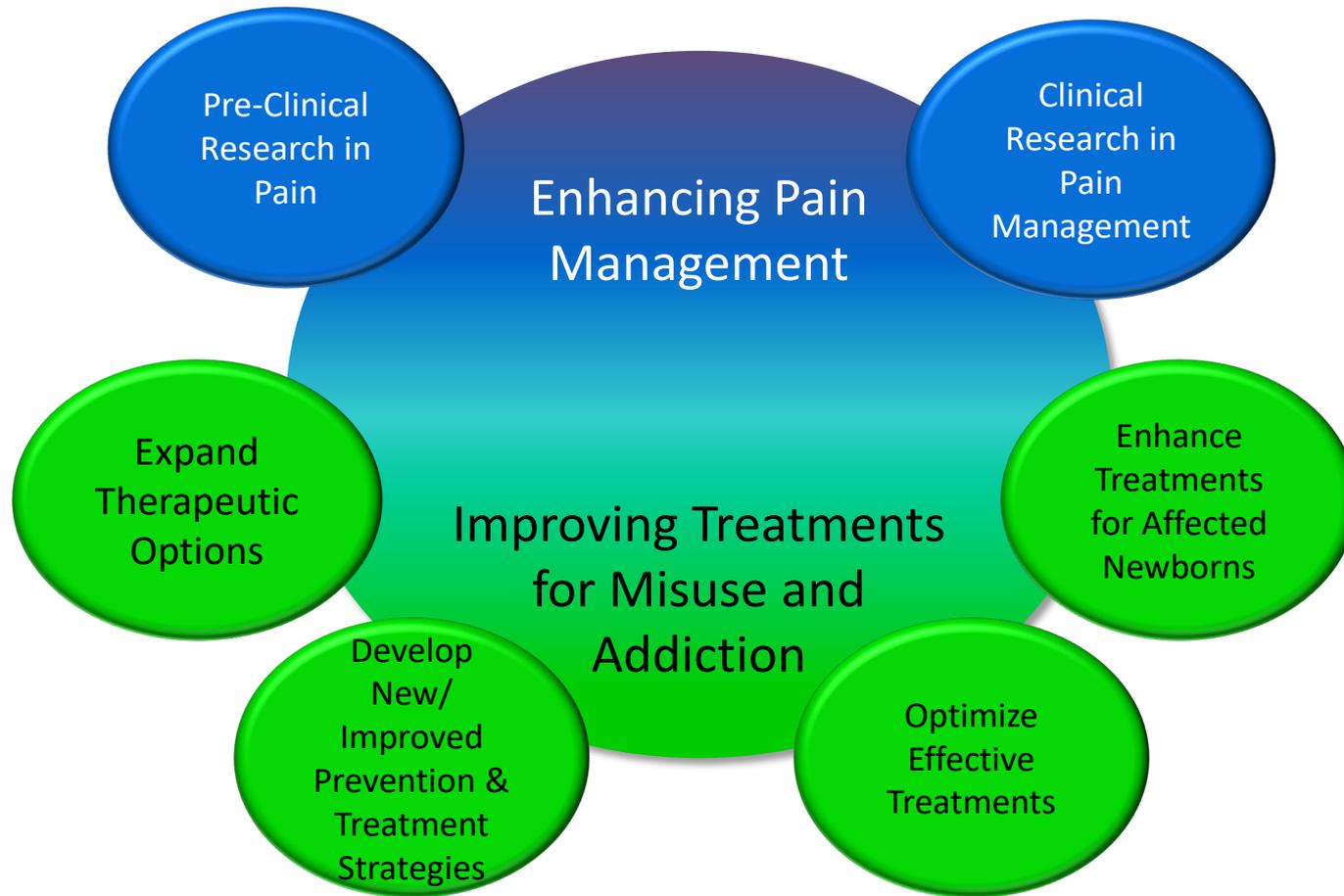


Read about the research plan:

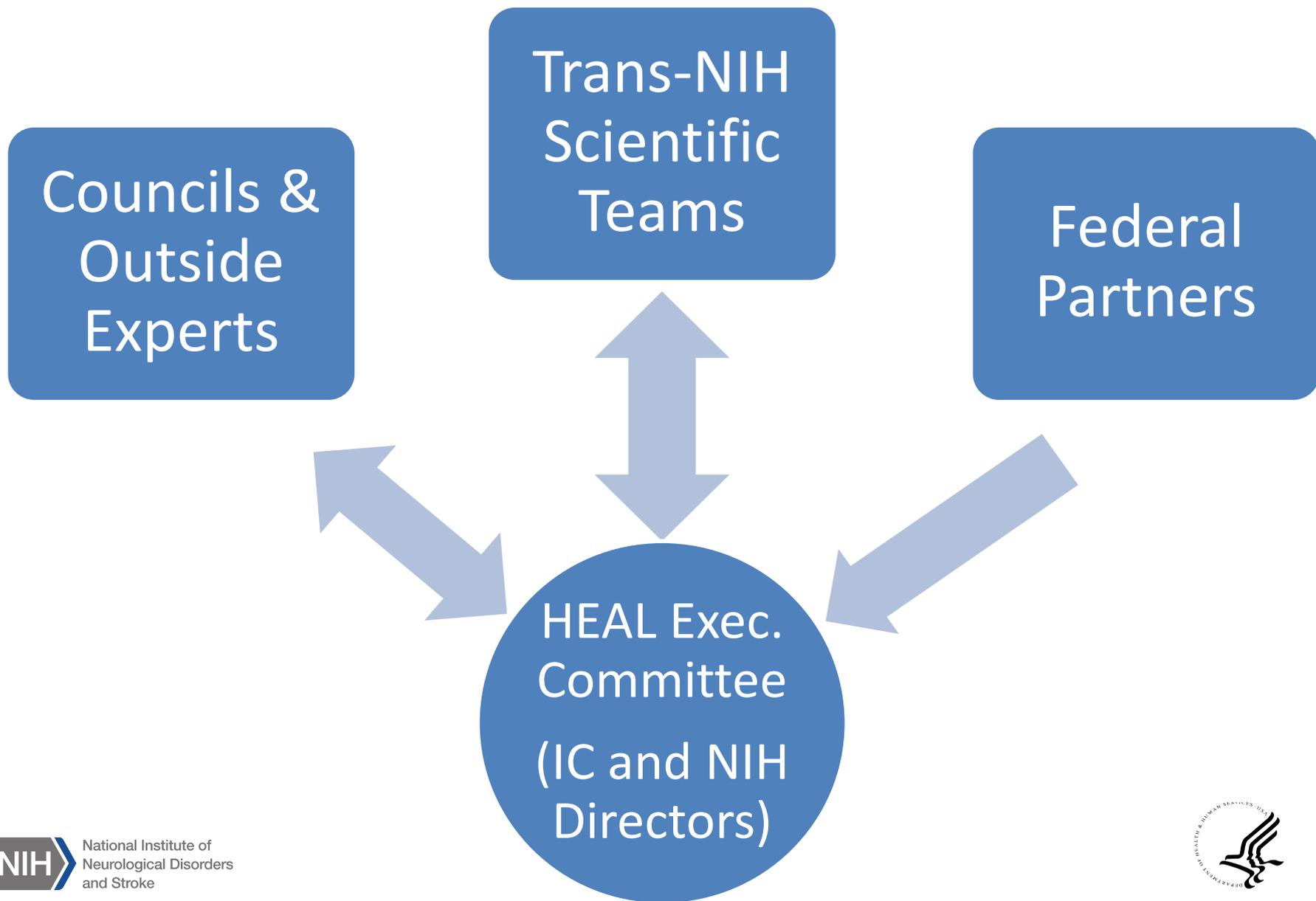
www.nih.gov/heal-initiative



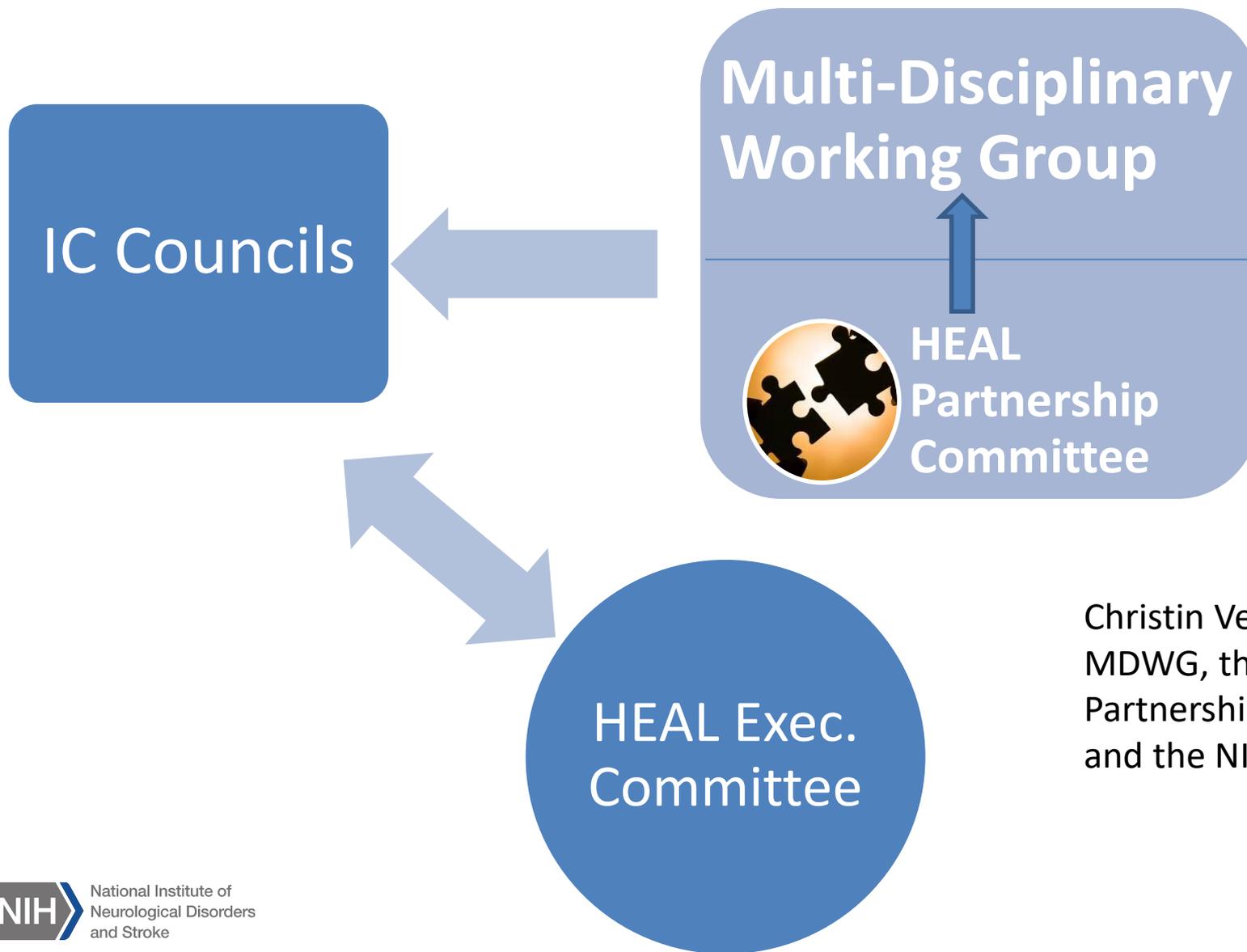
HEAL Initiative Research



HEAL Decision-Making

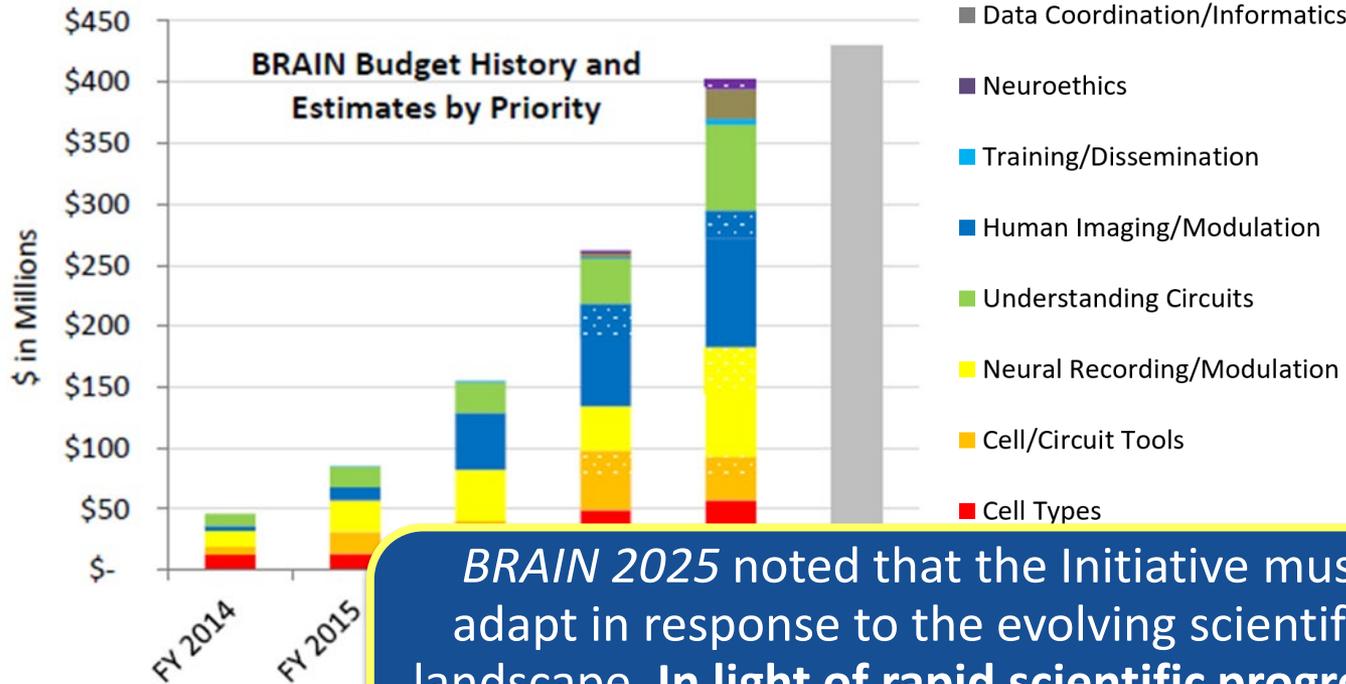


HEAL Decision-Making



Christin Veasley is on the MDWG, the HEAL Partnership Committee, and the NINDS Council.

BRAIN Investments



The 21st Century Cures Act provides **\$1.4 B** through FY2026

BRAIN 2025 noted that the Initiative must adapt in response to the evolving scientific landscape. In light of rapid scientific progress, NIH formed a new ACD BRAIN Initiative Working Group "2.0"

NIH FY 2014-2018 BRAIN Initiative

DATE	INVESTMENT	NEW AWARDS
FY 2014	>\$45M	>55
FY 2015	>\$85M	>65
FY 2016	>\$155M	>105
FY 2017	>\$260M	>110
FY 2018	>\$400M	>200
TOTAL	~\$950M	>530



2019 BRAIN Investigator's Meeting

Town Hall:

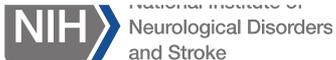


**ACD BRAIN WG and BNS co-chairs,
moderated by NIH Director Francis Collins**

Plenary Speakers:



Paola Arlotta
Harvard University



National Institutes of
Neurological Disorders
and Stroke



Edvard Moser
Kavli Institute for
Neuroscience



Patricia Churchland
University of
California



Markus Meister
Caltech



2019 BRAIN Investigator's Meeting

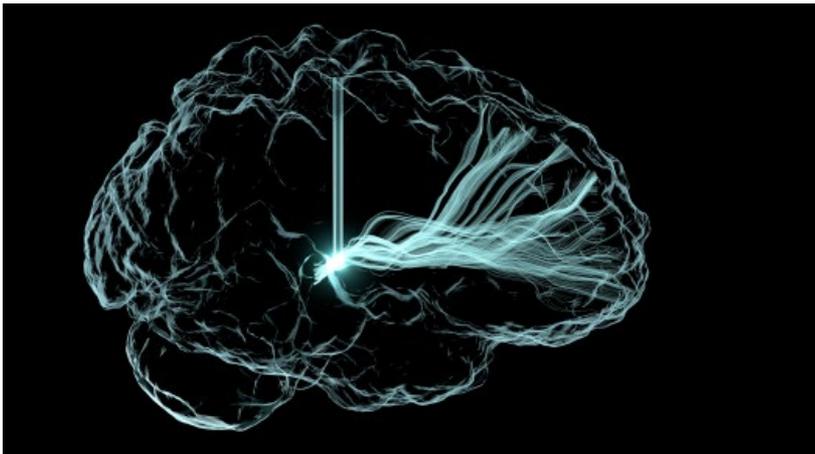
1600 meeting registrants

- ~33% increase from 2018 PI meeting
- Meeting featured poster sessions, trainee travel awards, research highlight talks, attendee-organized symposia, focused sessions, science communication workshops



Jon Hamilton (NPR)

Winners of 1st Show Us Your BRAINS! Cool Picture and Video Contest:



Andrew Janson, SCI Institute



Yang (UCLA) and Chung (MIT) Groups

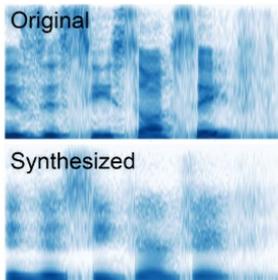
BRAIN Science Advances *Decoding Speech*

Functional Architecture of Speech Motor Cortex

Edward Chang, University of California, San Francisco

Anumanchipalli et al, [Nature](#), 2019

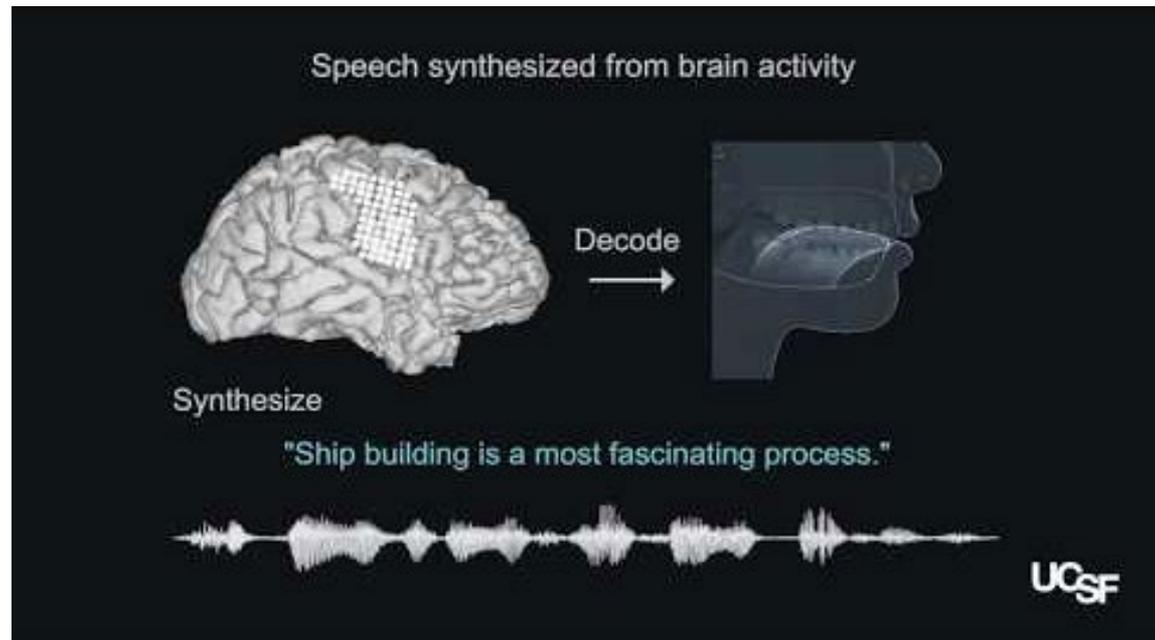
- Developed a neural decoder that leverages kinematic and sound representations encoded in human cortical activity to synthesize audible speech
- Decoder could synthesize speech when a participant silently mimed sentences



“Is this seesaw safe?”

Patients were asked to speak the complete sentence (top), and the recorded brain activity was used to create a synthesized version of the same sentence (bottom).

Image courtesy of Chang lab.



ARTICLE

<https://doi.org/10.1038/41586-019-1119-1>

Speech synthesis from neural decoding of spoken sentences

Gopala K. Anumanchipalli^{1,2*}, Josh Chartier^{1,2,3*} & Edward F. Chang^{1,2,3*}

The New York Times

Scientists Create Speech From Brain Signals

A prosthetic voice decodes what the brain intends to say and generates (mostly) understandable speech, no muscle movement needed.

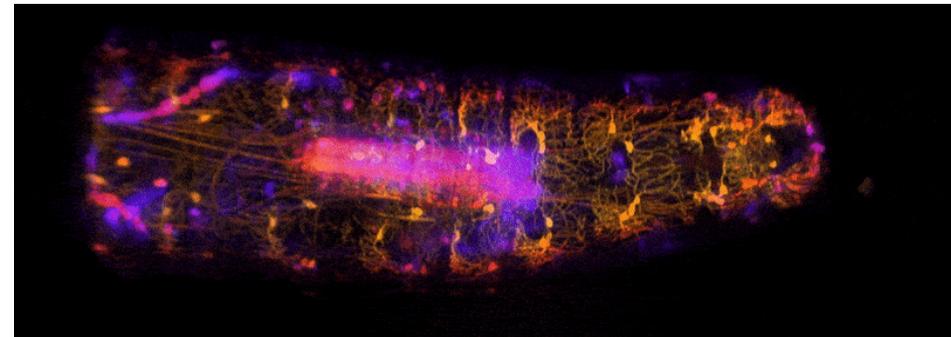
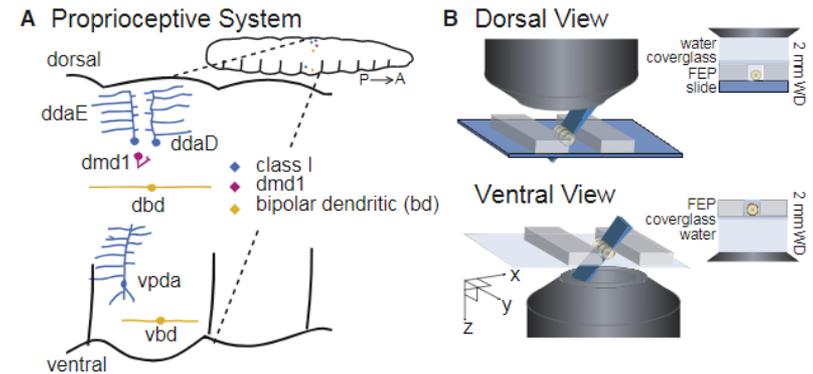
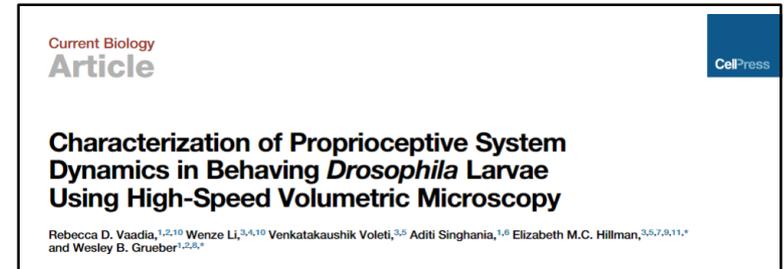
BRAIN Science Advances *In vivo microscopy*

High-speed in-vivo volumetric microscopy in behaving organisms

Elizabeth Hillman, Columbia - 5U01NS094296

Vaadia RD et al, [Current Biol](#), March 18, 2019

- How is sensory activity transformed into action? How do animals with flexible skeletons encode their body positions?
- High-speed volumetric Swept Confocally Aligned Planar Excitation (SCAPE) microscopy in crawling *Drosophila* larvae
- Tracked positions, deformation, and intracellular calcium activity of multidendritic proprioceptors
- Calcium activity is paired with dendrite formation

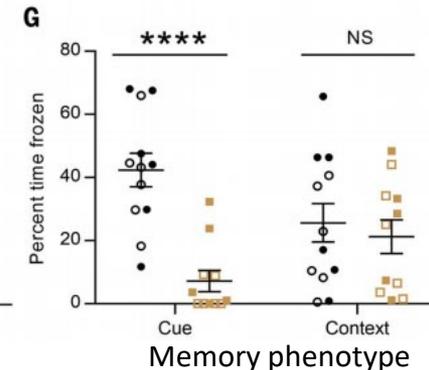
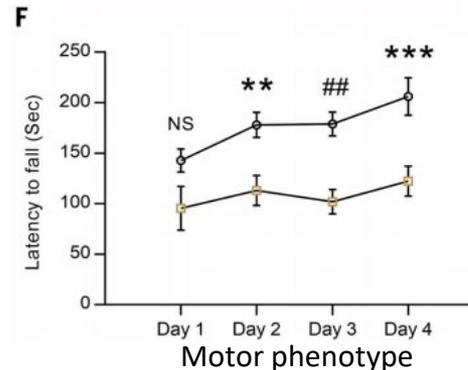
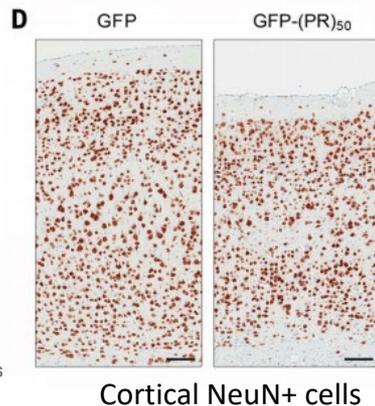
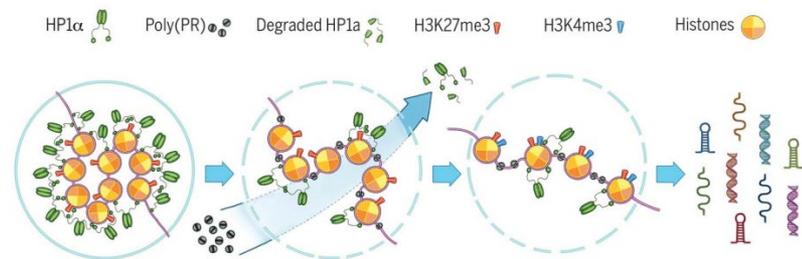
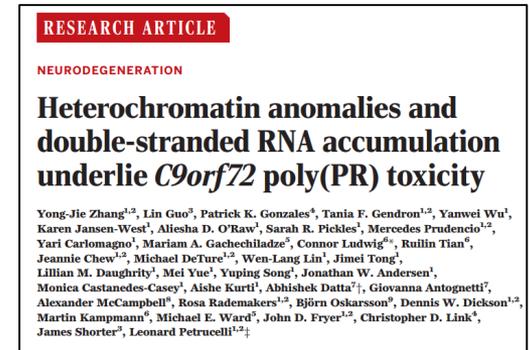


Science Advances *Mechanisms: ALS + FTD*

Heterochromatin anomalies and double-stranded RNA accumulation underlie C9orf72 poly(PR) toxicity

Vaadia RD et al, [Current Biol](#), March 18, 2019

- How do hexanucleotide repeat expansions in C9orf72 cause FTD and ALS?
- Mouse model expressing polyPR dipeptide repeats exhibits progressive brain atrophy, neuron loss, gliosis, and motor/memory impairments
- Aberrations in nuclear lamins and heterochromatin protein 1- α , increased repetitive element expression



Science Advances

Gene Silencing Therapy in HD

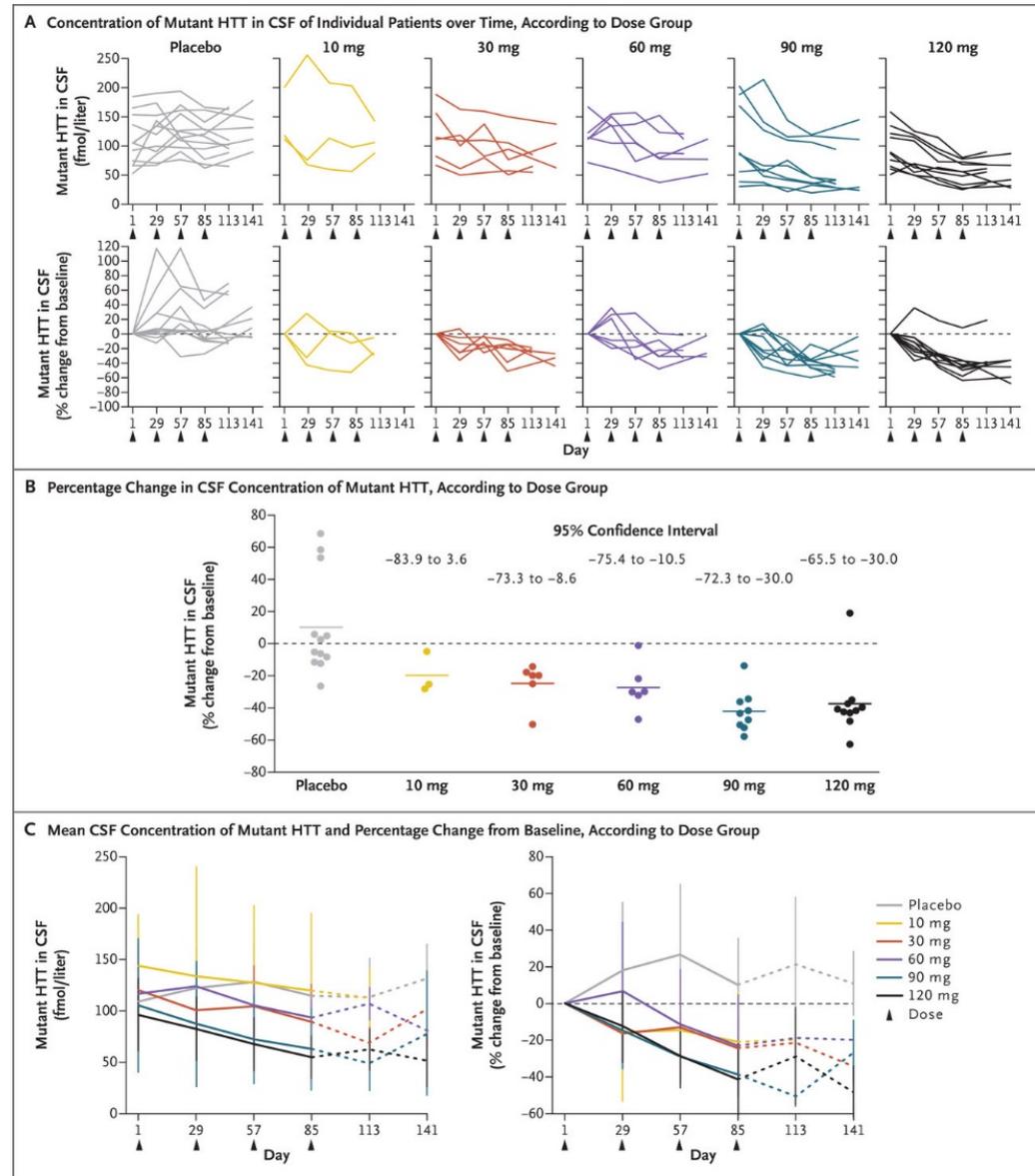
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Targeting Huntingtin Expression in Patients with Huntington's Disease

Tabriz et al, [N Engl J Med](#), 2019
University College London and Ionis Pharmaceuticals

- Will precise block of gene target by antisense oligonucleotide work? At what stage of disease?
- Phase 1-2a trial; 46 patients with early Huntington's disease
- Intrathecal administration of Huntingtin antisense oligo every 4 wks for 4 doses
- No serious adverse events; dose-dependent reduction in concentration of mutant HTT in CSF



Gene Therapy Workshops

The National Academies of SCIENCES ENGINEERING MEDICINE

#NeuroForum

**Advancing Gene-Targeted Therapies
for Central Nervous System Disorders**

A Workshop

April 23rd - 24th
Washington, DC

The Growing Promise of Gene Therapy
Approaches to Rare Diseases

August 20-21, 2018 National Institutes of Health • Bethesda, Maryland

NIH National Center for Advancing Translational Sciences FDA

Upcoming NINDS Workshop:
Next Generation Strategies for Gene-Targeted Therapies of Central Nervous System Disorders
North Bethesda Marriott
September 26-27, 2019

NINDS's Core Dilemma: *Seeking Input*

Question posed in January Council meeting:

- Given the critical importance of Neurotechnology core facilities to perform high level neuroscience across our grantee institutions, how should NINDS apportion its limited core resources to have the greatest impact?
 - i.e., Can't afford to fund cores at all sites that need them, but everyone needs them
- Discussion suggested Council resonated with this goal, but there no agreement around an approach

Request for Information (RFI): The NINDS is Soliciting Input on Enhancing Neuroscience Research at Institutions with Emerging Neuroscience Programs

Notice Number: NOT-NS-19-059

Key Dates

Release Date: May 17, 2019

Response Date: June 17, 2019

Please offer input by
June 17

Related Announcements

None

Issued by

National Institute of Neurological Disorders and Stroke (NINDS)

<https://www.ninds.nih.gov/RFI-NOT-NS-19-059>

Purpose

In recent years, an explosion in advanced neurotechnology has led to exciting new discoveries and advances in neuroscience. It has also led to a widening technology gap between leading neuroscience institutions, and institutions with emerging neuroscience programs. These advances in sophisticated approaches, technologies and instrumentation for neuroscience research have increased the need for cost-effective access to these resources through shared core facilities to enhance the quality of science. The purpose of this Request for Information (RFI) is to seek input from the neuroscience community to help define research resource needs at institutions where the growth of neuroscience research programs is limited by the lack of access to specialized expertise, instruments or services.

STRATEGIC PLANNING, 2020-2025

Process:

The Journey is More than Half the Destination



Substance:

Thought without Action is Meaningless; but Action without Thought is Dangerous

Vision

The discovery, innovation, research, and education performed and enabled by NINDS frees the world from the restriction and burden of neurological disorders.

Mission

The mission of NINDS is to seek fundamental knowledge about the brain and nervous system and to use that knowledge to reduce the burden of neurological disease.

Substance:

Thought without Action is Meaningless; but Action without Thought is Dangerous

Strategic Goals

- Be a model of excellence for supporting and performing significant, innovative, and rigorous neuroscience research.
- Be a model of excellence for funding and conducting neuroscience research training and career development programs and ensuring a vibrant, talented, and diverse neuroscience work force.
- Promote a supportive work culture for biomedical research and the neuroscience community.
- Promote the timely dissemination of accurate and rigorous information about scientific discoveries and their implications for neurological health.

Points of Input from the Outside Scientific and Lay Communities

