Research Priorities at the NIH & UT System

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Neuroscience
A National & Texas Research Priority

- Neurological/mental disorders cost the US $760 billion per year
- 5 million Americans living with Alzheimer’s Disease
- $226 billion estimated cost of care in 2015
- 340K Texans living with Alzheimer’s Disease
- Estimated 17% increase by 2020
- 6th leading cause of death in Texas
- Cost of care for Texans is estimated at $716 million
FY16 President’s Budget

- President’s FY16 NIH budget requests $1.1B increase above FY15
- BRAIN Initiative budget proposal increases $70M
- Budget for NIH is part of the FY16 Omnibus Appropriations Act
**FY16 Congressional Hearings - NIH**

- **October 7, 2015** - Senate Appropriations Subcommittee on Labor, HHS, Education, on Investing in a Healthier Future
- **April 30, 2015** - Senate Appropriations Subcommittee on Labor, HHS, Education, and Related Agencies
- **March 10, 2015** - Senate Committee on Health, Education, Labor, and Pensions on Continuing America’s Leadership in Medical Innovation for Patients
- **March 3, 2015** - House Appropriations Subcommittee on Labor, HHS, Education on FY 2016 Budget Request
- **February 2, 2015** - NIH Director’s presentation on the NIH FY2016 Budget Request

**Bottom Line** - Bipartisan support for preserving/enhancing NIH Budget in future years
## NIH Budget Request FY 2016

<table>
<thead>
<tr>
<th>YEAR</th>
<th>FY15</th>
<th>PRESIDENT’S FY16</th>
<th>HOUSE FY16</th>
<th>SENATE FY16</th>
</tr>
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<tbody>
<tr>
<td>NIH ($B)</td>
<td>30,084</td>
<td>31,311</td>
<td>31,200*</td>
<td>32,084</td>
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*11/20/15 – Dear Colleague Letter-102 House Republicans support $33.084 billion*
FY16 Omnibus Appropriations Act (P.L. 114-74)

Passed December 18, 2015

- NIH Appropriation: $32.1 billion
- $2.0 billion increase over FY15 (~6.5%)
  - $150 M for BRAIN Initiative ($85 M increase over FY15)
  - $350 M for Alzheimer’s disease research (new $ for NIA)
  - $200 M for PMI ($130 M to Common Fund; $70 M to NCI)
  - $100 M to combat antimicrobial resistance
NIH-27 Institutes/ Centers*

* Each IC-Different Missions, Responsibilities and Constituencies
Exceptional Opportunities in Medical Science
A View From the National Institutes of Health

As the world's largest source of biomedical research funding, the US National Institutes of Health (NIH) has been advancing understanding of health and disease for more than a century. Scientific and technological breakthroughs that have arisen from NIH-supported research account for many of the gains that the United States has seen in health and longevity. I look forward to a medical landscape in which the pairing of affordable, efficient DNA sequencing and electronic health records could be used to inform a lifetime of health care strategies. Combined with the use of mobile health technology to assist in real-time monitoring of factors such as diet, exercise, blood pressure, heart rate, and blood chemistries, this approach could...
NIH FY 2016 Budget Request: Targeted Increases

- Precision Medicine Initiative $200 M
- Cancer $70 M
- Antimicrobial resistance $100 M
- The BRAIN Initiative® $70 M
- Alzheimer’s Disease $50 M
NIH FY16 Targeted Area - Alzheimer’s Disease

- Major investment in Alzheimer’s disease (AD) research
- FY16 request totals $638 M – increase of $50 M
- Basic research in neuroscience
- Epidemiologic studies to identify risk and protective genes
- Clinical studies for early diagnosis and progression

- Accelerating Medicines Partnership (AMP)
  - First projects: AD, type 2 diabetes, lupus, rheumatoid arthritis
  - FY16 request totals $23 million, same as FY15
NIH FY16 Targeted Area - The BRAIN Initiative®

• FY14 - 58 awards for $46 M

• FY15 - 67 new awards for $38 M

• FY16 - Budget request totals $155 M – increase of $70 M
NIH FY16 Targeted Area - The BRAIN Initiative®

November 2015: FY16 RFA announcements include:

- BRAIN Initiative: Non-Invasive Neuromodulation - New Tools and Techniques for Spatiotemporal Precision (R01) [RFA-MH-16-810]
- BRAIN Initiative: Non-Invasive Neuromodulation - Mechanisms and Dose/Response Relationships for Targeted CNS Effects (R01) [RFA-MH-16-815]
- BRAIN Initiative: Development and Validation of Novel Tools to Analyze Cell-Specific and Circuit-Specific Processes in the Brain (R01) [RFA-MH-16-775]
- BRAIN Initiative: New Technologies and Novel Approaches for Large-Scale Recording and Modulation in the Nervous System (U01) [RFA-NS-16-006]
- BRAIN Initiative: Optimization of Transformative Technologies for Large Scale Recording and Modulation in the Nervous System (U01) [RFA-NS-16-007]
NIH FY16 Targeted Area - The BRAIN Initiative®

October 2015: FY16 RFA announcements for human studies include:

- (UG3/UH3) **Next-Generation Invasive Devices for Recording and Modulation in the Human Central Nervous System** (Receipt Date April 26, 2016)

- (UH3) **Clinical Studies to Advance Next-Generation Invasive Devices for Recording and Modulation in the Human Central Nervous System** (Receipt Date April 26, 2016)
NIH FY16 Targeted Area – Alzheimer’s & Related Dementias

- NIA received $350 M for AD dementia research
- NIA released 10 FOAs in October 2015 for funding in FY16
  - Aging in human cell models of AD
  - AD clinical trials consortium
  - Neurodegenerative disease biorepository
  - From Association to function in the AD post genomic era
  - Technology to assess everyday function
  - Mobile consent
- FOAs are broad spectrum PAs for basic, clinical to care giver research
- FY16 funding will accelerate progress on the National AD Plan
NIH FY16 Targeted Area – Alzheimer’s & Related Dementias

- NINDS is the NIH lead on AD-related dementias
- NINDS proposes FOAs in FY16 for ~$17 M (several released in Oct 2015)
  - Biomarkers for small vessel contributions to VCI and Dementia
  - Biomarkers for Lewy body dementia
  - Basic research on diffuse white matter disease in VCI and Dementia
  - Tau biology and contribution to neurodegeneration
  - Disparities in dementia
Observations
Changing Neuroscience Research Environment

• New emphasis on attracting scientists from outside biology
• New emphasis on rigor in experimental design and statistical analysis
• Tools have become more sophisticated, and an increased degree of sophistication is needed for data analysis
• Early steps within the BRAIN Initiative to adapt a more “physics-like” model for team approach to address “big life science” challenges
Observations
Changing Neuroscience Training Environment

- Graduate student numbers increasing dramatically
- Time to independence increasing
- Attempts to increase diversity in trainees not translating well into diversity in the academic sciences
- Funding became more competitive during the last 12 flat budgets that may have contributed to a decline in career mentoring
- NIH is concerned about the future workforce and addresses training issues through most new initiatives
Observations
Changing Federal Research Environment

- **BRAIN Initiative**
  - Message is research needs a multi, trans, inter disciplinary effort
  - Recognized by most NS communities as important for progress in science

- **Increased Interactions** among different research communities encouraged at:
  - Federal agency level, i.e. joint agency Initiatives
  - NIH level, i.e. Common Fund, Neuroscience Blueprint
  - NIH IC level, i.e. Cooperative Translational Programs, NCATS, AMP

- **Reworking NIH Study Sections** for broader scientific input
- **Evolving from a silo** to a sharing/partnership model
- **Federal Budget** is difficult to predict outcome: Stronger bipartisan support for NIH
- **NIH Priority-setting** reflects IC’s mission and investment opportunities (better funding predictor)

- **Bottom Line:** Neuroscience research will continue as a top priority for NIH
# NIH Awards & Funding FY15 - Top 10 States*

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<tr>
<th>STATE</th>
<th>AWARDS</th>
<th>FUNDING</th>
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<tbody>
<tr>
<td>California</td>
<td>8,238</td>
<td>$3,860,380,521</td>
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<tr>
<td>New York</td>
<td>5,327</td>
<td>$2,561,615,502</td>
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<td>Massachusetts</td>
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<td>Pennsylvania</td>
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<td>Texas</td>
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<td>Maryland</td>
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<td>Ohio</td>
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<td>Washington</td>
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<td>$999,409,158</td>
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*NIH Reporter
Federal Funding In Texas FY15

• **NIH** - $1.2 B (2,711 awards) *(NIH Reporter)*
  – *University of Texas System*
  • **599 million NIH funds awarded in FY15** (51% of all NIH funds awarded in Texas)
  • **1,565 NIH grants awarded in FY15** (58% of all NIH grants awarded in Texas)

• **NSF** - $328,506,000 (1,163 awards) FY15 *(SfN source)*

• **CDC** - $152,790,507 FY14 *(CDC)*
$264 M in neuroscience-related NIH awarded in Texas

The UT System is home to 66% of all NIH neuroscience-related awards in Texas

$171 M in neuroscience-related NIH funds awarded to UT in FY15

489 NIH Grants related to UT neuroscience in FY15

29% of all UT NIH grants are neuroscience-related for FY15
Challenge: Align Federal -Texas Research Priorities

Neuroscience Research

NIH Priorities
• **White House announced the BRAIN Initiative (2/2013)**
  – Focused on collaboration & trans-disciplinary research

• **UT System organized the Neuroscience Council (6/2013)**
  – The Council brings together top researchers from UT’s 14 academic and health institutions to explore new convergent research that takes advantage of:
    • faculty expertise in disciplines such as engineering, computer science, mathematics, materials science, neuroscience, physics, and chemistry
    • cutting-edge resources such as the 10-petaflop supercomputer at UT Austin
UT BRAIN - Background

• UT Regents provide funding to support collaborative & trans-disciplinary neuroscience research (8/2014)

• Virtual UT System-Neuroscience & Neurotechnology Research Institute (NNRI) formed (8/2014)

• NNRI Advisory Board organized (10/2014)

• Initiative (UT BRAIN) for seed grant proposals released (2/2015)
UT BRAIN: First Funding Round

• Call for proposals February 2015
• 158 proposals submitted, all UT System institutions
• 103 peer reviewers selected from outside Texas
• All applicants received feedback and review results (NIH model)
• Abstracts & reviewer list available at:
  https://www.utsystem.edu/sites/neuroscience
• Award letters and funding administered in August 2015
UT BRAIN – Peer Review Results

• Payline: average score=2.67 (range 1-9)
• Top 45 of 158 applications awarded $100K each ($4.5M total)
• Success Rate-28% (NIH success rate -17%)
  – New collaborations - 100%
  – Trans-disciplinary collaborations - 96%
  – Trans-institutional collaborations - 44%
  – Early stage investigators – 48%
Examples of new collaborations seeding innovative neurotechnologies

• Optogenetics
  – Design a virus-based reporter of neural activity (*Zemelman/Drew)
    • Potential: uncover the cellular basis of behavior

• Circuitry
  – Identify neuronal specific viruses (*Roberts/Schoggins)
    • Potential: new tools to explore multiple circuits simultaneously
  – Develop DNA fluorescent tracers for imaging circuit rewiring (*Xu/Vitella)
    • Potential: visualize neuronal circuit connectivity and plasticity over time

• Material Science
  – Develop bio-compatible, highly integrated, multifunctional devices (*Luan/Xie)
    • Potential: enable long-term optical stimulation and electrical recording in a 3D array
UT BRAIN is already stimulating national interest and recognition

- Contact with >300 labs nationally during the review process

- Agencies following UT BRAIN progress
  - White House (OSTP)
  - National Institute of Neurological Disease and Stroke/NIH
  - Society for Neuroscience, the largest scientific society for the field

- > 1000 hits on the UT System Neuroscience Website
The BRAIN Initiative® Partners*

**Federal**
- NIH
- NSF
- DARPA
- IARPA
- FDA
- WH-OSTP

**Non-Federal**
- Foundations
- Universities
- Institutes
- Industry

- Boston University
- Carnegie Mellon University
- Pacific Northwest Neuroscience
- University of California System
- University of Pittsburgh
- University of Texas System
- University of Utah

*http://www.braininitiative.nih.gov/
U. T. System - Neuroscience and Neurotechnology Research Institute - Next Steps

Under Consideration for FY16:

• Second Call for Collaborative Grant Proposals
  – Strong proposals reviewed in first round
  – New concepts and collaborations being discussed

• Thematic-based Collaborative Neuroscience Group Awards
  – Advisory Board recommendation

• NeuroSTARS
U. T. BRAIN - Resources

U. T. System Neuroscience Website: https://www.utsystem.edu/sites/neuroscience
  - Seed Grant Announcement
  - Peer Reviewer & Affiliation List


Office of Federal Relations Twitter: #UTBRAIN

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President’s FY17 NIH Budget Request

• $33.1 B ($825 M above FY16 level; 2.5% increase)

• Targeted increases – from Mandatory Funds*
  – $680 M National Cancer Moonshot
  – $100 M PMI Cohort
  – $45 M BRAIN Initiative

*Mandatory funds are short term gov’t assets outside the appropriation process
NIH Neuroscience Research Opportunities: Next 10-Years

**BRAIN Initiative**
- National Research Priority White House/Congress
- NIH, NSF, DARPA, Industry, Private & University Partnerships

**CNS Translational Research**
- NeuroNEXT; Cooperative Translational Award; CTSA
- NCATS; NS Blueprint, 13 NIH ICs –Neurotherapeutics Network

**Stroke Research**
- National Stroke Research Plan (NINDS, NIA, NHLBI, NICHD)
- Vascular Cognitive Impairment/Dementia Initiatives (NIA, NINDS, NHLBI) in FY16
- Stroke Trials Network (StrokeNet)

**Alzheimer’s Disease-Vascular Dementia**
- HHS-AD Task Force; National AD Plan; NIA & NINDS Priority
- 21st Century Cures Act
- AD Bypass Budget for NIH
- $350M in new funds for FY16
UT Neuroscience Network

UT ARLINGTON: NERVE AND TBI STUDIES

UT SOUTHWESTERN MEDICAL CENTER: ALZHEIMER'S

UT DALLAS: CENTER FOR BRAINHEALTH

UT AUSTIN: INSTITUTE FOR NEUROSCIENCE

UT MD ANDERSON: BRAIN TUMOR RESEARCH

UTHSC HOUSTON: NEUROBIOLOGY CENTER

UTMB: CENTER ON AGING

UTHSC SAN ANTONIO: INSTITUTE ON AGING

UTSA: NEUROSCIENCE INSTITUTE
UT→Texas→US Neuroscience Network