



Medical  
Rehabilitation  
Research  
Resource

N E T W O R K

**Rehabilitation Clinical Trials:**  
**Innovations, Designs, and Tribulations**

**Funding Agency Resources**

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## **NIH National Center for Advancing Translational Sciences (NCATS)**

Christopher Hartshorn, PhD – Chief, Digital & Mobile Technologies Section

## **Veterans Affairs Rehabilitation Research & Development (VA RR&D)**

Timothy Brindle, PhD – Scientific Program Manager

## **National Institute on Disability, Independent Living and Rehabilitation Research (NIDILRR)**

Radha Holavanahalli, PhD – Rehabilitation Program Specialist

## **Craig H. Neilsen Foundation**

Jacob Shreckengost, PhD – Program Officer

*Spinal Cord Injury Research on the Translational Spectrum (SCIRTS)*

## **Congressionally Directed Medical Research Programs (CDMRP)**

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## **National Science Foundation**

Grace Hwang, PhD – Program Director

*Disability and Rehabilitation Engineering (DARE) Program*

# ***Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)**

## **Research Grant Mechanisms (R Series)**

<https://www.nichd.nih.gov/grants-contracts>

### **Research Project Grants (R01)**

- Investigator-initiated applications; focus on specific set of aims
- Budget: no boundaries, but typically \$250,000 (modular, direct costs) annually
- Duration: may request up to 5 years of funding; renewable
- Clinical trial not allowed: [PA-20-185](#); Basic experimental studies with humans (BESH) required: [PA-20-183](#); Clinical trial required: [PA-20-183](#)

### **Small Research Grants (R03)**

- Pilot studies (feasibility); development of new methodology or technology
- Not renewable; not to be used to supplement funded projects
- Budget: up to \$50,000 per year (direct costs) for 2 years
- Parent R03 Clinical Trial Not Allowed: [PA-20-200](#)

### **Academic Research Enhancement Award (AREA) and Research Enhancement Award (REAP) Grants (R15)**

- Only schools that have not been major recipients of NIH funds are eligible
- Potential for undergraduate research experience is important
- Budget: aggregate budget up to \$300,000 (direct costs) for up to 3 years; renewable
- AREA: Clinical trial not allowed: [PAR-21-155](#); Clinical trial required: [PAR-21-154](#)
- REAP: Clinical trial not allowed: [PAR-22-060](#); Clinical trial required: [PAR-21-357](#)

### **NICHD Exploratory/Developmental Grants Program (R21)**

- Exploratory, high-risk/high-impact studies
- Budget: up to \$275,000 total direct costs distributed over 2 years
- Clinical trial not allowed: [PA-20-195](#); Basic experimental studies with humans (BESH) required: [PA-20-196](#); Clinical trial required: [PA-20-194](#)

### **Small Business Technology Transfer (STTR) Grants (R41/R42)**

#### **Small Business Innovation Research (SBIR) Grants (R43/R44)**

- Innovative research that has potential for commercialization
- STTR: Academic/business collaboration; phase I: \$150,000 (1 year)/II: \$1,000,000 (2 years)
- Clinical trial not allowed: [PA-22-178](#); Clinical trial required: [PA-22-179](#)
- SBIR: Primarily at business site; phase I: \$150,000 (6 months)/II: \$1,000,000 (2 years)
- Clinical trial not allowed: [PA-22-176](#); Clinical trial required: [PA-22-177](#)

### **Conference and Scientific Meeting Grants (R13 and U13)**

- Support conferences and workshops; Prior approval from program staff required
- Clinical trial not allowed: [PA-21-151](#)

### **NICHD Research Education Programs (R25)**

- Innovative and interactive short-term educational courses for researchers
- Focused on high priority research areas for NICHD; Clinical trial optional: [PAR-20-250](#)

## Training & Career-Development Mechanisms

<https://www.nichd.nih.gov/grants-contracts/training-careers/extramural>

### Individual Fellowships (F Series)

<https://researchtraining.nih.gov/programs/fellowships>

- **F30:** Predoctoral Fellowship for Students at Institutions without NIH-Funded Institutional Predoctoral Dual-Degree Training Programs Parent F30: [PA-21-050](#)
- **F30:** Predoctoral Fellowship for Students at Institutions with NIH-Funded Institutional Predoctoral Dual-Degree Training Programs Parent F30: [PA-21-049](#)
- **F31:** Predoctoral Fellowship Parent F31: [PA-21-051](#)
- **F31:** Predoctoral Fellowship to Promote Diversity in Health-related Research: [PA-21-052](#)
- **F32:** Postdoctoral Fellowship Parent F32: [PA-21-048](#)

### Individual Career Development (K Series)

<https://researchtraining.nih.gov/programs/career-development>

#### **K01: Mentored Research Scientist Development**

- Clinically trained individuals in targeted areas with advanced degree (e.g., PhD)
- 3 to 5 years of mentored training
- NICHD targets K01s in: medical rehabilitation; child abuse & neglect; population research  
Clinical Trial Not Allowed: [PA-20-190](#); BESH Required: [PA-20-191](#); Clinical Trial Required: [PA-20-176](#)

#### **K08: Mentored Clinical Scientist**

- Clinically trained (e.g., MD, DVM, DDS), seeking training in basic research
- 3 to 5 years of mentored support at 75-percent effort  
Clinical Trial Not Allowed: [PA-20-203](#); BESH Required: [PA-20-201](#); Clinical Trial Required: [PA-20-202](#)

#### **K23: Mentored Patient-Oriented Research Career Development**

- Clinically trained (e.g., MD), seeking training in patient-oriented clinical research
- 3 to 5 years of mentored support at 75-percent effort  
Clinical Trial Not Allowed: [PA-20-205](#); BESH Required: [PA-20-204](#); Clinical Trial Required: [PA-20-206](#)

#### **K25: Mentored Quantitative Research Career Development**

- Quantitative or engineering background, entering into biomedical research
- 3 to 5 years of mentored support at 75-percent effort  
Clinical Trial Not Allowed: [PA-20-199](#); BESH Required: [PA-20-198](#); Clinical Trial Required: [PA-20-197](#)

#### **K99/R00: Pathway to Independence Award**

- No more than 4 years post-doctoral experience at time of application
- 1 to 2 years of mentored support (<\$100k/yr.), then three years faculty support (<\$249k/yr.)
- NICHD Administrative review for transition from K99 to R00 phase  
Clinical Trial Not Allowed: [PA-20-188](#); BESH Required: [PA-20-189](#); Clinical Trial Required: [PA-20-187](#)
- Postdoctoral Career Transition Award to Promote Diversity (K99/R00)  
Clinical Trial Not Allowed: [PA-21-271](#), BESH Required: [PA-21-273](#), Clinical Trial Required: [PA-21-272](#)

### Institutional Training Grants (T32)

<https://researchtraining.nih.gov/programs/training-grants>

- To support Predoctoral and/or Postdoctoral Fellows: [PA-20-142](#)

### Research Supplements to Promote Diversity in Health-related Research

- Individuals at any career level from under-represented racial and/or ethnic groups, disadvantaged backgrounds, having a disability, or re-entering research after family obligation are eligible. Must be US citizen/green card-national
- May not exceed duration of currently funded NICHD grant  
Clinical Trial Not Allowed: [PA-21-071](#)

## **NCATS Information and Resources for 2022 MR3 Network Scientific Retreat**

**NCATS Website:** <https://ncats.nih.gov/>

- Open Funding Opportunities: <https://ncats.nih.gov/funding/open>

**Rare Diseases Research Network (RDCRN)** <https://rarediseasesnetwork.org/>

The Rare Diseases Clinical Research Network (or RDCRN) that advances research in rare diseases.

- NCATS coordinates a consortium of 10 NIH Institutes and Centers supporting clinical studies on >200 rare diseases
- A more-than-one-disease-at-a-time approach, the RDCRN studies at least 3 rare disease therapeutic areas together
- Patient advocacy groups are an integral part of the research team

**Tissue Chips for Drug Screening** <https://ncats.nih.gov/tissuechip>

The Tissue Chip for Drug Screening program aims to develop bioengineered devices to improve the process of predicting whether drugs will be safe or toxic in humans.

- Tissue Chip Funding Information: <https://ncats.nih.gov/tissuechip/funding>

**Clinical and Translational Science Awards (CTSA) Program** <https://ncats.nih.gov/ctsa>

The CTSA Program is designed to develop innovative solutions that will improve the efficiency, quality and impact of the process for turning observations in the laboratory, clinic and community into interventions that improve the health of individuals and the public.

- CTSA Program Funding Information: <https://ncats.nih.gov/ctsa/funding>
- CTSA Trial Innovation Network (TIN) <https://trialinnovationnetwork.org/>
  - The CTSA Trial Innovation Network addresses roadblocks in clinical trials and accelerates the translational of novel interventions into life-saving therapies.
  - The Trial Innovation Network offers study investigators of multi-site trials the ability to request an initial consultation or specific resources for a trial, whether funded or in the planning stages.
  - TIN Liaison Team Member: <https://trialinnovationnetwork.org/liaison-teams/?key-element=1601>
- National COVID Cohort Collaborative (N3C) <https://ncats.nih.gov/n3c>
  - The National COVID Cohort Collaborative (N3C) maintains one of the largest collections of clinical data related to COVID-19 symptoms and patient outcomes in the United States. With stewardship from NCATS, more than 75 institutions worked together to build this extensive database. Having access to a large, centralized data resource allows research teams to study COVID-19 and identify potential treatments as the pandemic evolves. [Learn the facts about the N3C by downloading and sharing the N3C fact sheet](#) (PDF - 382KB).
  - Researcher Essentials: <https://covid.cd2h.org/for-researchers>

- Gain Access to the Enclave:
  - Complete the [Enclave Registration Checklist](#) to expedite your N3C Data Enclave account creation.
  - Follow the [Enclave Registration Instructions](#) to request and access your enclave account.

**NIH HEAL Initiative** <https://heal.nih.gov/>

The Helping to End Addiction Long-term® Initiative, or NIH HEAL Initiative®, is an aggressive, trans-agency effort to speed scientific solutions to stem the national opioid public health crisis. Almost every NIH Institute and Center is accelerating research to address this public health emergency from all angles.

Resources of the Trial Innovation Network are here to support these HEAL projects. CTSA Hubs and their Liaison Teams will assist investigators applying for TIN resources to support their grant application, using our regular portal submission process.

- HEAL Initiative: Interdisciplinary Team Science to Uncover the Mechanisms of Pain Relief by Medical Devices (RM1 Clinical Trial Optional) ([RFA-NS-23-003](#))
- Other HEAL funding opportunities: <https://heal.nih.gov/funding>

**Office of Research & Development (ORD)  
Rehabilitation Research & Development Service (RR&D)**

**VA Research Information on the Web**

**VA ORD Supported Research**

- Search on NIH RePORTER website: [report.nih.gov/index.aspx](http://report.nih.gov/index.aspx)
- Search on Clinical Trials website: [clinicaltrials.gov](http://clinicaltrials.gov)

**VA ORD Main Site:** [www.research.va.gov](http://www.research.va.gov)

- Career Development Program: [www.research.va.gov/funding/cdp.cfm](http://www.research.va.gov/funding/cdp.cfm)
- Centers: [www.research.va.gov/programs](http://www.research.va.gov/programs)
- Research Videos: [www.research.va.gov/news/videos.cfm](http://www.research.va.gov/news/videos.cfm)

**Grant Writing Seminars:**

- Training in Grantsmanship for Rehabilitation Research (TIGRR) <http://tigrr.bme.unc.edu/>
- NIA Butler-Williams Scholars Program (formerly Summer Institute on Aging Research) – Applications accepted in March for attendance in July
- US Bone & Joint Initiative (USBJI) Young Investigator Initiative <http://www.usbji.org/programs/yii>

**Additional ORD Information**

- Handbooks: select under General ORD Policies  
<http://www.research.va.gov/resources/policies/>
- Rehabilitation Research and Development  
<http://www.rehab.research.va.gov/>
- Health Services Research and Development  
<http://www.hsrp.research.va.gov/>
- Biomedical Laboratory Research and Development  
<http://www.research.va.gov/services/blrd/default.cfm>
- Clinical Science Research and Development  
<http://www.research.va.gov/services/csrp/default.cfm>

# Department of Veterans Affairs (VA)

## Office of Research & Development (ORD)

### Rehabilitation Research & Development Service (RR&D)

#### RR&D Scientific Program Managers



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**Office of Research & Development (ORD)**  
**Rehabilitation Research & Development Service (RR&D)**

**RR&D Research Award Types**

All applications undergo scientific peer review

- **Center Awards**
  - 5 years, \$1.26M/year
- **Research Enhancement Award Program (REAP)**
  - 5 years, \$440K/year
- **Merit Awards**
  - \$1.2M total budget cap for 4 years
- **Small Projects in Rehabilitation Research (SPiRE)**
  - 1-2 years, \$115K/year

Intended for:

- High Risk/High Impact research; for preliminary data & feasibility
- Small projects that can be completed in a two-year period, no powered studies
- Preference given to Early Career Stage Investigators
- New scientific areas of focus for established investigators
- Editorial-style review; 3 independent reviews in written form only
- Scoring limited to three designations: Highly Meritorious, Meritorious, or Not Meritorious
- **Research Career Scientists**
  - 5 - 7 years, salary support
- **Career Development Awards (CDA) - mentored research opportunities**

All awards

  - US citizen
  - VA at time of award but not required at time of application
  - VA primary mentor
  - Support includes awardee salary (except MD, shared with clinical care), protected research time
  - Review criteria emphasize candidate's qualifications, as well as mentorship, career development, and research plans
- **CDA – 1**
  - Must apply within 2 years of training
  - Award up to 2 years, provides full salary support, \$20K/year operational funds
- **CDA – 2**
  - Must apply within 5 years of training
  - Award up to 5-years, full salary support, \$75K/year operational funds
- **Minority Serving Institution (MSI) (previously Historically Black Colleges & University (HBCU))**
  - Features of CDA-2
  - Additional mentor(s) from MSI/HBCU

**Office of Research & Development (ORD)**  
**Rehabilitation Research & Development Service (RR&D)**

**CDA Submission Deadlines and Contacts**

Letter of Intent (LOI) Submission			
SERVICE	DEADLINE per Cycle	Email ADDRESS	CONTACT
Biomedical Laboratory R&D	May 1 Nov1	<a href="mailto:vhacadereview@va.gov">vhacadereview@va.gov</a>	Questions about the program should be send to the Career Development mailbox.
Clinical Science R&D	May 1 Nov 1	<a href="mailto:vhacadereview@va.gov">vhacadereview@va.gov</a>	Questions about the program should be send to the Career Development mailbox.
Health Services R&D	April 15 Oct 15	<a href="mailto:robert.small@va.gov">robert.small@va.gov</a>	Robert Small, BA (202) 443-5743
Rehabilitation R&D	May 1 Nov 1	<a href="mailto:rrdreviews@va.gov">rrdreviews@va.gov</a>	Shirley Groer, PhD (202) 443-5767
MSI-CDA (HBCU & other)	Follows Service LOI Deadlines	BLRD/CSR&D: <a href="mailto:vhacadereview@va.gov">vhacadereview@va.gov</a> HSRD: <a href="mailto:Robert.Small@va.gov">Robert.Small@va.gov</a> RRD: <a href="mailto:rrdreviews@va.gov">rrdreviews@va.gov</a>	Contact the appropriate Service representative above regarding submissions

**CDA Award Types: Eligibility and Conditions**

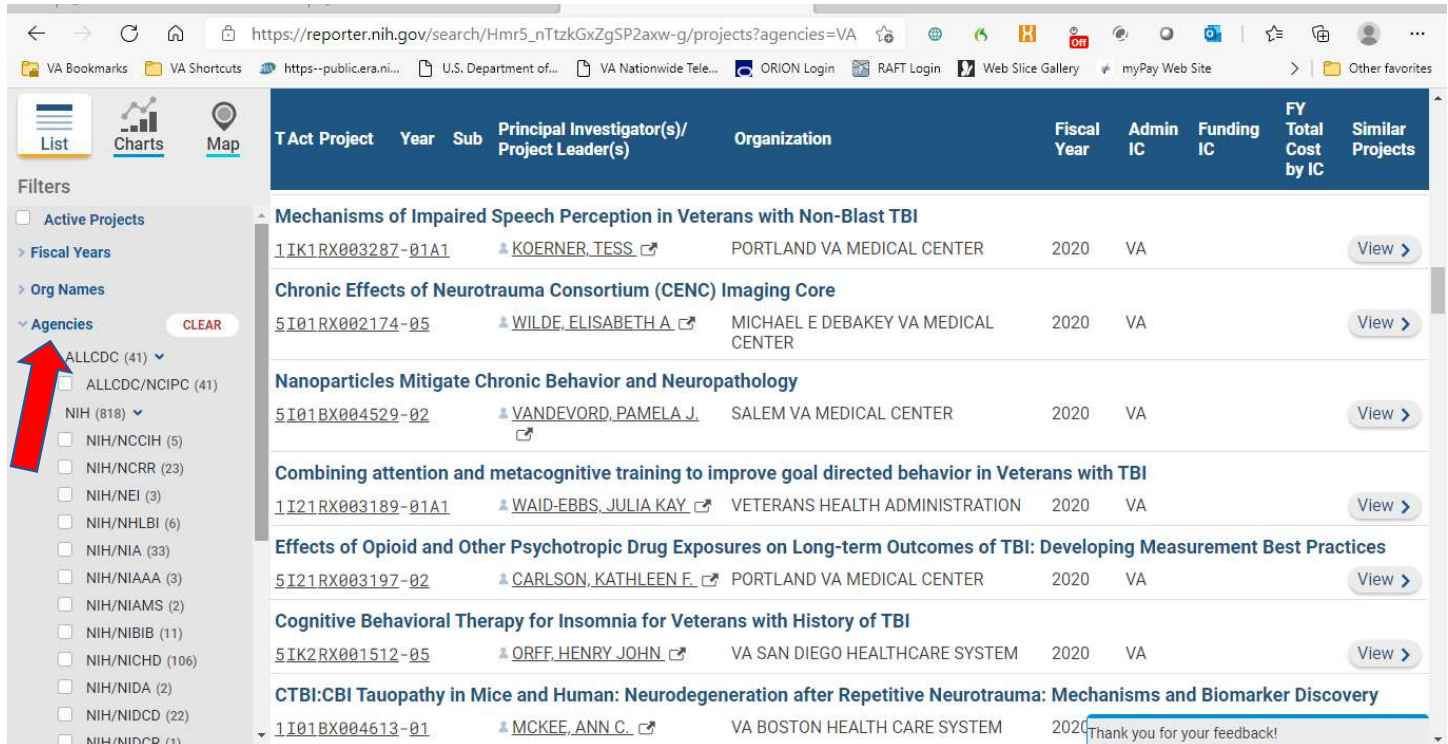
	CDA-1 (CS/BL* & RR&D)	CDA-2	MSI
Clinician salary	9 calendar months plus 1/8 <sup>th</sup> from VAMC	6-9 calendar months plus 1/8 <sup>th</sup> from VAMC	6-9 calendar months plus 1/8 <sup>th</sup> from VAMC
Non-clinician salary	7.5-12 calendar months	7.5-12 calendar months	7.5-12 calendar months
Project funds	\$20K/yr to extend work of mentor	\$75K/yr for independent Work	As per service-specific RFA
Award duration	Up to 2 years	3-5 years	Up to 2 years (BL/CS)* 3-5 years (RR&D)
Eligibility	Max of 2 years beyond completion of training	Max of 5 years beyond completion of training	Same as 1 or 2 plus mentors at both HBCU and VA

\*BL & CSR&D have targeted CDA-1 RFAs for VA psychiatrists, US military veteran scientists, suicide prevention, & MSI

## INTERESTED TO LEARN ABOUT VA RESEARCH? GET STARTED!

### Does VA fund research in my scientific area of interest and at what facilities?

- Search NIH RePORTER tool and use guidance as indicated below
  - User's guide manual and video: <https://obssr.od.nih.gov/research-support/nihreporter/>
  - NIH RePORTER query form: <https://reporter.nih.gov/>
  - Enter topic(s) of interest in the Quick Search box. Then from the results:



https://reporter.nih.gov/search/Hmr5\_nTtzkGxZgSP2axw-g/projects?agencies=VA

VA Bookmarks VA Shortcuts https--publicera.ni... U.S. Department of... VA Nationwide Tele... ORION Login RAFT Login Web Slice Gallery myPay Web Site Other favorites

List Charts Map

Filters

- ☐ Active Projects
- ☐ Fiscal Years
- ☐ Org Names
- ☒ Agencies CLEAR
  - ALLCDC (41)
    - ☐ ALLCDC/NCIPC (41)
  - NIH (818)
    - ☐ NIH/NCCIH (5)
    - ☐ NIH/NCRR (23)
    - ☐ NIH/NEI (3)
    - ☐ NIH/NHLBI (6)
    - ☐ NIH/NIA (33)
    - ☐ NIH/NIAAA (3)
    - ☐ NIH/NIAMS (2)
    - ☐ NIH/NIBIB (11)
    - ☐ NIH/NICHD (106)
    - ☐ NIH/NIDA (2)
    - ☐ NIH/NIDCD (22)
    - ☐ NIH/NIDCR (1)

T Act Project	Year	Sub	Principal Investigator(s)/ Project Leader(s)	Organization	Fiscal Year	Admin IC	Funding IC	FY Total Cost by IC	Similar Projects
<b>Mechanisms of Impaired Speech Perception in Veterans with Non-Blast TBI</b>									
1IK1RX003287-01A1			KOERNER, TESS	PORTLAND VA MEDICAL CENTER	2020	VA			<a href="#">View &gt;</a>
<b>Chronic Effects of Neurotrauma Consortium (CENC) Imaging Core</b>									
5I01RX002174-05			WILDE, ELISABETH A	MICHAEL E DEBAKEY VA MEDICAL CENTER	2020	VA			<a href="#">View &gt;</a>
<b>Nanoparticles Mitigate Chronic Behavior and Neuropathology</b>									
5I01BX004529-02			VANDEVORD, PAMELA J	SALEM VA MEDICAL CENTER	2020	VA			<a href="#">View &gt;</a>
<b>Combining attention and metacognitive training to improve goal directed behavior in Veterans with TBI</b>									
1I21RX003189-01A1			WAID-EBBS, JULIA KAY	VETERANS HEALTH ADMINISTRATION	2020	VA			<a href="#">View &gt;</a>
<b>Effects of Opioid and Other Psychotropic Drug Exposures on Long-term Outcomes of TBI: Developing Measurement Best Practices</b>									
5I21RX003197-02			CARLSON, KATHLEEN F	PORTLAND VA MEDICAL CENTER	2020	VA			<a href="#">View &gt;</a>
<b>Cognitive Behavioral Therapy for Insomnia for Veterans with History of TBI</b>									
5IK2RX001512-05			ORFF, HENRY JOHN	VA SAN DIEGO HEALTHCARE SYSTEM	2020	VA			<a href="#">View &gt;</a>
<b>CTBI: CBI Tauopathy in Mice and Human: Neurodegeneration after Repetitive Neurotrauma: Mechanisms and Biomarker Discovery</b>									
1I01BX004613-01			MCKEE, ANN C	VA BOSTON HEALTH CARE SYSTEM	2020				<a href="#">View &gt;</a>

Thank you for your feedback!

- Click on “Agencies” and choose “VA” (red arrow-above)
- Or begin query for VA funded research and for VA Investigators:
  - NIH RePORTER query form: <https://reporter.nih.gov/>
  - Scroll down to Advanced Projects Search
  - **Search by Agency/Institute/Center:** Select Veterans Affairs (VA) (red arrow below)

**Advanced Projects Search**

Fiscal Year ?  Current FY is 2022

Principal Investigator (PI) ?

Organization ?

Agency/Institute/Center ?  ☒ Admin ☐ Funding

Project Number/ Application ID ?

Looking for additional search fields? [Click here to view All Search Fields](#)

- The query will generate a list of all active VA funded projects.
  - Click on the project title hypertext in the search results to get more information on each project.
  - Note the panel on the left for categories of information on the project.
- To search only for rehab funded VA projects, click on the option to “view All Search Fields” (blue arrow above). Under Project Number in the screen below, enter RX in the third box. See highlight.
  - RX for Rehabilitation R&D
  - BX for Biomedical Laboratory R&D
  - CX for Clinical Science R&D
  - HX for Health Services R&D

## Project Details

Agency/Institute/Center ? 1 x	NIH Spending Category ?	Funding Mechanism ?
<input type="text" value="VA"/> <input type="button" value="x"/> <input type="button" value="..."/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> Admin <input type="checkbox"/> Funding	<input type="radio"/> AND <input checked="" type="radio"/> OR	
Award Type ?	Project Number/ Application ID ?	Activity Code ?
<input type="text"/>	<input type="text"/>	<input type="text"/>
	<small>Format: 5R01CA012345-04/ 8515397, semicolon ";" separated</small> OR <div style="display: flex; align-items: center;"> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">1</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">R01</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px; background-color: yellow;">CA</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">811099</div> <div style="border: 1px solid #ccc; padding: 2px 5px; margin-right: 5px;">01</div> <div style="border: 1px solid #ccc; padding: 2px 5px;">A1S1</div> </div>	

## Who can I contact to learn more about VA research mission and priorities in my scientific area of interest?

- Contact the Office of Research and Development Scientific Program Managers:
  - Rehabilitation R&D: <https://www.rehab.research.va.gov/staff/science1.html>
  - Biomedical Laboratory R&D and Clinical Science R&D:  
[https://www.research.va.gov/services/shared\\_docs/contacts.cfm](https://www.research.va.gov/services/shared_docs/contacts.cfm)
  - Health Services R&D: <https://www.hsrp.research.va.gov/about/portfolio.cfm>

## Does VA support researchers early in their career?

- Yes, go to <https://www.research.va.gov/funding/cdp.cfm>

## How do I find a VA mentor?

- Search the NIH RePORTER tool <https://reporter.nih.gov/> for VA investigators working in your area of interest.

## How do I learn more about starting research at a VA near me?

- Contact Associate Chiefs of Staff for R&D: [https://www.research.va.gov/about/national\\_directory.cfm](https://www.research.va.gov/about/national_directory.cfm)

# **Medical Rehabilitation Research Resource (MR3) Network Scientific Retreat on Rehabilitation Clinical Trials**

## **Funding Agency Q&A Session**

Radha Holavanahalli, PhD.

National Institute on Disability, Independent Living,  
and Rehabilitation Research (NIDILRR)

Administration for Community Living, HHS

September 29, 2022

# NIDILRR's Mission

To generate new knowledge and to promote its effective use:



To improve the abilities of individuals with disabilities to perform activities of their choice in the community



To expand society's capacity to provide full opportunities and accommodations for its citizens with disabilities

# What We Sponsor (Annual Budget of \$116 M)

## Research & Development

- Interventions and products to improve long-term outcomes and community living

## Capacity Building

- Training young investigators and retraining clinicians to pursue research careers

## Knowledge Translation

- Promoting the use of R&D findings and products by people with disabilities, their families, and other stakeholders

# Core Principles

## Social Model of Disability

- Outcomes = (Person x Environment)

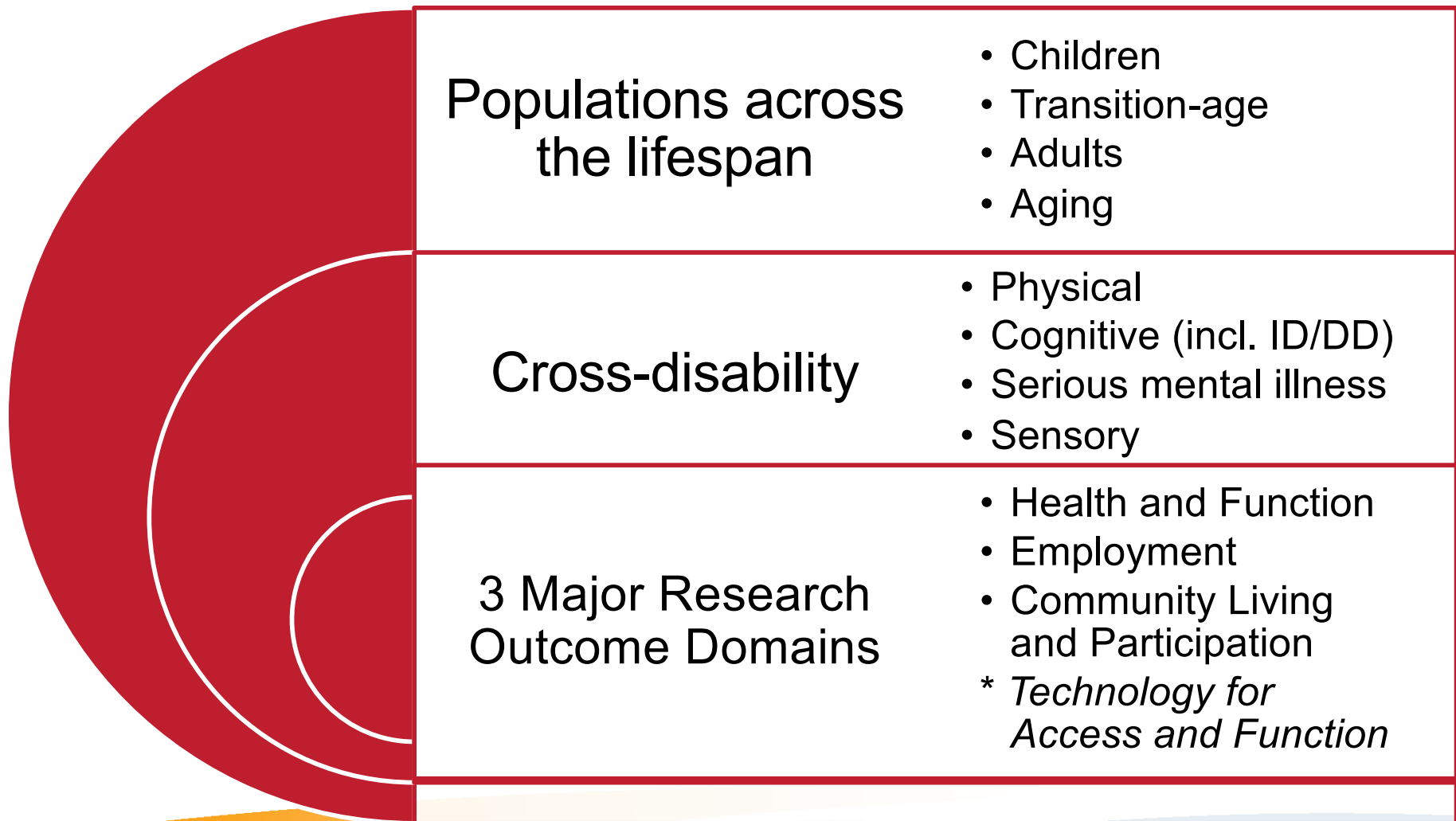
## Rigor and Relevance

- NIDILRR optimizes the rigor of the R&D we sponsor, AND the relevance of the R&D to the lives of people with disabilities

## Building the Evidence Base

- The ultimate aim of all NIDILRR R&D is evidence-based interventions and products to better serve and support people with disabilities in the community

# Breadth of Responsibility



# Applications: Rigor – Relevance Balance



## Rigor

The diagram features two large red downward-pointing chevrons on the left side. The top chevron is labeled 'Rigor' and the bottom chevron is labeled 'Relevance'. To the right of each chevron is a white rectangular box with a red border containing a bulleted list of criteria. The bottom of the slide is decorated with a blue and orange wavy graphic.

- Wide range of methods can be judged rigorous if appropriate for the study objectives and if consistent with the state of the science for a specific topic
- Largest percentage of peer review points available (40-50%)

## Relevance

- Funding Opportunity Announcements require applicants to explain how proposed new knowledge and products will result in positive outcomes among people with disabilities.
- Peer review criteria (up to 20% of points)
- Grant requirements including grantee engagement with people with disabilities and other stakeholders

# Stages of Research

- Research applicants
  - must define the stage or stages of research that they propose to conduct
  - Any rigorous quantitative, qualitative, or mixed-methods research can be appropriate, depending on the hypothesis or research question
  - NIDILRR does not have an absolute preference for one methodological approach or research stage
  - If research can be categorized under more than one stage including research that progresses from one stage to another, those stages must be clearly specified
  - The stages are: exploration and discovery, intervention development, intervention efficacy, and scale-up evaluation

# Types of Grant Awards

- Mary Switzer Research Fellowships
- **Field-Initiated Projects (Research and Development) (FIP)**
- Advanced Rehabilitation Research Training (ARRT)
- Small Business Innovation Research Grants (SBIR)
- **Rehabilitation Research and Training Centers (RRTC)**
- **Rehabilitation Engineering Research Centers (RERC)**
- **Disability and Rehabilitation Research Projects (DRRP)**
- **SCI, TBI and Burn Injury Model System Centers (SCIMS, TBIMS, BMS)**
- ADA National Network
- Knowledge Translation Centers

# Field-Initiated Project (FIP)

- Wide range of disability and rehabilitation topics and methods proposed by applicants
- Awards may be for research or development projects addressing one or multiple outcome domains
- Approximately 200 applications/year (NIDILRR's largest competition)
- Approximately 18 awards per year
- Up to \$200,000 per year
- Three-year awards

# Disability and Rehabilitation Research Projects (DRRP)

- NIDILRR's most flexible funding mechanism
  - Field-initiated or agency-driven
  - Various combinations of research, development, and related activities
- \$300,000–\$995,000 per year
- Up to five years
- 38 active awards
- Used to sponsor specific, large NIDILRR programs (Model Systems, ADA TA Centers)

# Model System Centers

- Comprised of:
  - Traumatic Brain Injury (16 Centers + National Data and Statistical Center)
  - Spinal Cord Injury (14 Centers + National Data and Statistical Center)
  - Burn Injury (4 Centers + National Data and Statistical Center)
  - Model Systems Knowledge Translation Center (MSKTC)
- In each Program, Centers:
  - Conduct site-specific research studies
  - Conduct Model Systems collaborative research studies
  - Contribute longitudinal data to a collective database
    - Data collected at regular intervals from the time of injury until death
    - The SCI, TBI and Burn Injury National Databases are the oldest and largest longitudinal databases in existence for the respective injury groups
    - Analyses of the databases generate knowledge re: long-term outcomes (in health, function, and community living and participation) and changes in outcomes over time as people age with the injury
  - Collaborate with the MSKTC to translate research findings for stakeholders
- Five-year awards; \$361,000 - \$483,500 per center per year

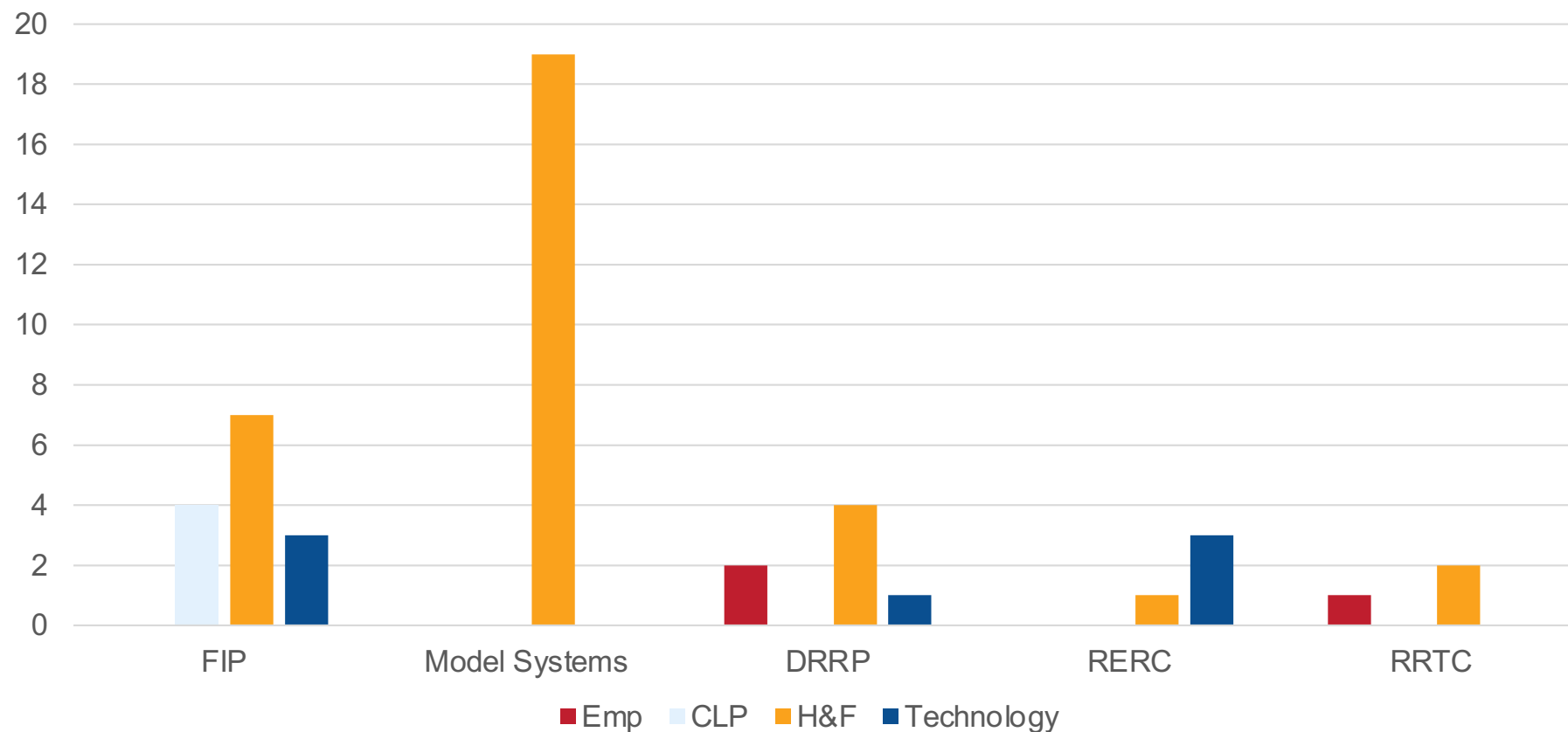
# Rehabilitation Research and Training Centers (RRTCs)

- RRTCs conduct multiple research projects at various stages
- RRTCs serve as “National Resource Centers” on specific topics
- Required to engage in research, as well as training, dissemination, and technical assistance
- NIDILRR may specify the general target population or outcome domain, or a specific topic that must be addressed
- Multiple RRTC competitions each year
- \$850,000 per year, on average
- Five-year awards

# Rehabilitation Engineering Research Centers (RERCs)

- RERCs engage in *Research and Development*, as well as *Training, Technical Assistance, and Dissemination*.
- RERC research activities generate *New Knowledge* in the form of peer-reviewed publications, seminars, & workshops
- RERC development activities generate *New Products* in the form of tools, models, methods, devices, applications, & standards
  - **Product Development and Adoption** is facilitated by a *Technology Transfer Plan* developed by the grantee; working with the *KT4TT* (a KT center).
- RERC Training Activities (e.g. coursework, internships) build *Rehabilitation Engineering Capacity*.
- Multiple RERC competitions each year. NIDILRR may specify the general rehabilitation engineering area to be addressed, or a specific topic that must be addressed
- Awards - 21 active; 5-year duration; \$925,000 per year (average).

# Clinical Trials: Project Type By Funding Priority



# Examples

- FIP:

- a randomized controlled trial to test the effectiveness of a financial literacy intervention called Building Financial Wellness (BFW) delivered to adults with serious mental illness (Community Living and Participation)
- examine the efficacy of an existing intervention, the Reinventing Yourself after SCI, which has been proven effective among individuals with spinal cord injury (SCI), for use in multiple sclerosis (MS). The Reinvention intervention is aimed at improving self-efficacy, psychological well-being, and quality of life via cognitive behavioral therapy and positive psychology techniques (Health and Function)
- evaluate the extent to which a novel treatment (T-WRITE) improves written language function and the use of text messaging for people with aphasia, who often have difficulty with writing and may struggle to use electronic communication that connects people to one another (Technology for Access and Function)

# Examples

- DRRP:

- the use of customized employment (CE) as an intervention to assist individuals with intellectual disabilities (ID) and/or autism spectrum disorder (ASD) to achieve integrated employment outcomes (**Employment**)
- a multisite, randomized, double-blind, placebo controlled trial of venlafaxine XR (Effexor XR) in 168 adults with spinal cord injury (SCI) and major depressive disorder (MDD) who are 18 to 65 years old and one or more years post injury. The purpose of the study is to examine the efficacy and tolerability of venlafaxine XR as a treatment for MDD (**Health and Function**)
- Community Access Through Remote Eyesight (CARE) Study - a randomized clinical trial evaluating the efficacy of novel mobile application (app) technologies (including Seeing AI, Aira, and SuperVision+) to improve quality of life in older adults with low vision by expanding community access and providing assistance with activities of daily living (**Technology for Access and Function**)

# Examples

- Model System Centers:

- a randomized controlled trial of Virtual-Environment Home Rehabilitation - addresses the feasibility and practicality of a self-directed, technology-driven home rehabilitation program and analyzes whether technology-driven home-based rehabilitation improves functional outcomes for individuals with **burns** in a real-world setting
- a longitudinal randomized clinical trial to identify whether a home-based intervention that was demonstrated to be effective at reducing chronic shoulder pain in persons with **SCI** could be used as a preventative program to decrease the rate of shoulder pain onset
- a site-specific, double-blind, placebo controlled randomized clinical trial of an evidence-based cognitive rehabilitation intervention for learning and memory deficits following **TBI**

# Examples

- **RERC:**

- A randomized clinical trial of a serious game developed to enhance self-management ability among adolescents and young adults with spinal cord dysfunction

- **RRTC:**

- The RRTC on Health and Function for People with Physical Disabilities focuses on people with physical disability who have neurogenic lower urinary tract dysfunction (NLUTD) - Assessment of neuromodulation of the bladder using transcutaneous tibial nerve stimulation in a randomized controlled trial

# Engage with NIDILRR

## Learn about NIDILRR

<https://www.acl.gov/about-acl/about-national-institute-disability-independent-living-and-rehabilitation-research>

<https://acl.gov/news-and-events/announcements/new-nidilrr-long-range-plan>

## Receive Funding Opportunity Announcements

<http://www.naric.com/?q=node/33>

## Review NIDILRR grant forecast/open grant competitions

<http://www.grants.gov/web/grants/search-grants.html?cfda=93.433>

# Engage with NIDILRR

Search NARIC to learn about NIDILRR-funded research in your topic areas

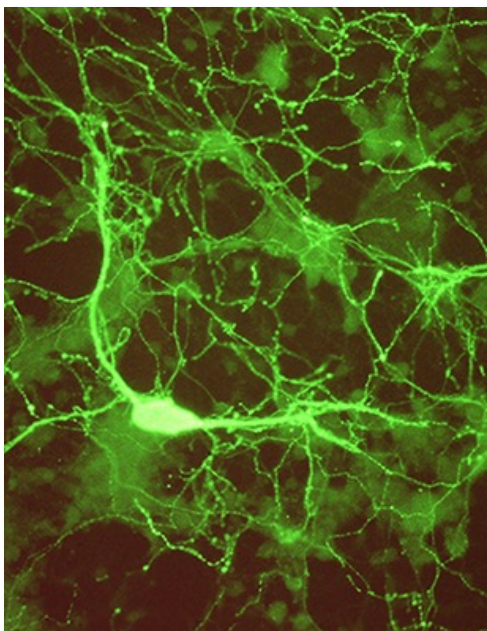
<https://www.naric.com/?q=en/ProgramDatabase>

Engage with NIDILRR grantees

Become a NIDILRR Peer Reviewer

<https://rrm.grantsolutions.gov/AgencyPortal/acl.aspx>

Contact Information:  
Radha Holavanahalli, PhD  
Rehabilitation Program Specialist  
[Radha.Holavanahalli@acl.hhs.gov](mailto:Radha.Holavanahalli@acl.hhs.gov)



# Foundation Funding in SCI Rehabilitation Research

Jacob Shreckengost, PhD  
Program Officer  
Craig H. Nielsen Foundation  
[www.chnfoundation.org/](http://www.chnfoundation.org/)



# Neilsen Mission and Values

## Mission

*Funding is dedicated to supporting both programs and scientific research to improve the quality of life for those affected by and living with spinal cord injury*

Our values are inspired by Craig H. Neilsen

They are the lens we use in making funding and decisions

### Leadership

*Lead by  
example*

### Inclusion

*Expand  
opportunity*

### Excellence

*Transparency, rigor  
Results*

### Collaboration

*Leverage  
knowledge*

### Creativity

*Take bold  
initiatives*

# What We Fund – Grants to U.S. and Canadian Organizations

**Research:** cells to psychosocial; dishes to animals to people

- SCI Research on the Translational Spectrum (**SCIRTS**)
- Psychosocial Research (**PSR**)

**Programs:** nonprofit/community activities and resources

- Creating Opportunity & Independence (**CO&I**)
  - Arts, Sports & Recreation; Assistive Tech; Education; Employment; Independent Living; Rehabilitation

**Education:**

- SCI Medicine Fellowships (**SCIMF**) – specialty rehab training in SCI medicine
- Neilsen Scholarship Program (**NSP**) – support for students with SCI

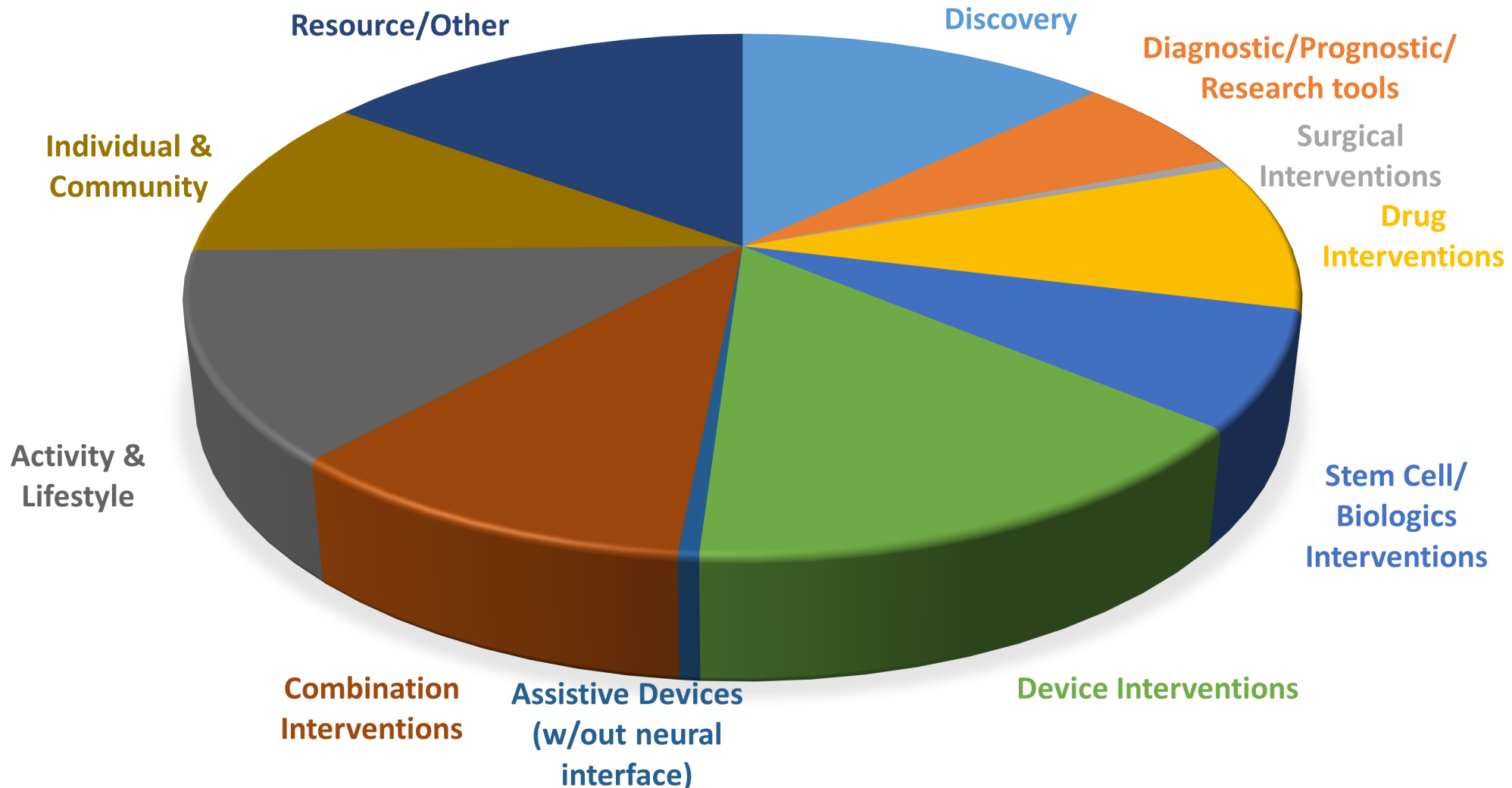
**Strategic Grants:**

Invited programs to meet specific needs

# Research Funding Areas



## RESEARCH APPROACH AND INTERVENTION - 2021 GRANTS



Both current and previously funded studies can be reviewed through our searchable database: <https://chn.dimensions.ai/discover/grant>

# Program Staff; deadline structures

## Portfolios

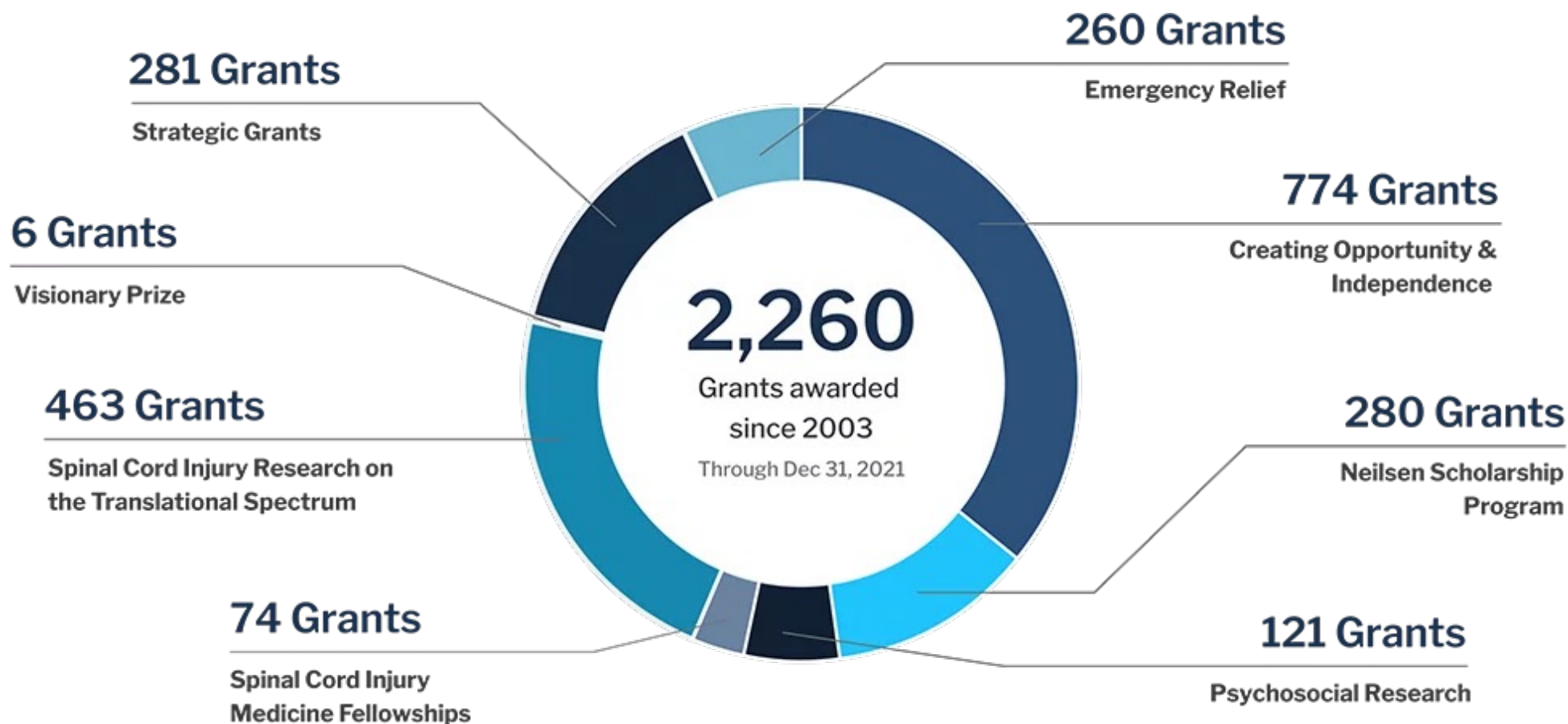
- SCI Research on the Translational Spectrum (SCIRTS)
  - Letter of Intent OPEN – April
  - Letter of Intent Results – September
  - Full Grant Applications DUE – November 11, 2022
  - Awards Announced – June, 2023
- Psychosocial Research
  - Letter of Intent OPEN – January
  - Letter of Intent CLOSES – March
  - Letter of Intent Results – May
  - Full Grant Application DUE – July
  - Awards Announced – December

## Program Staff

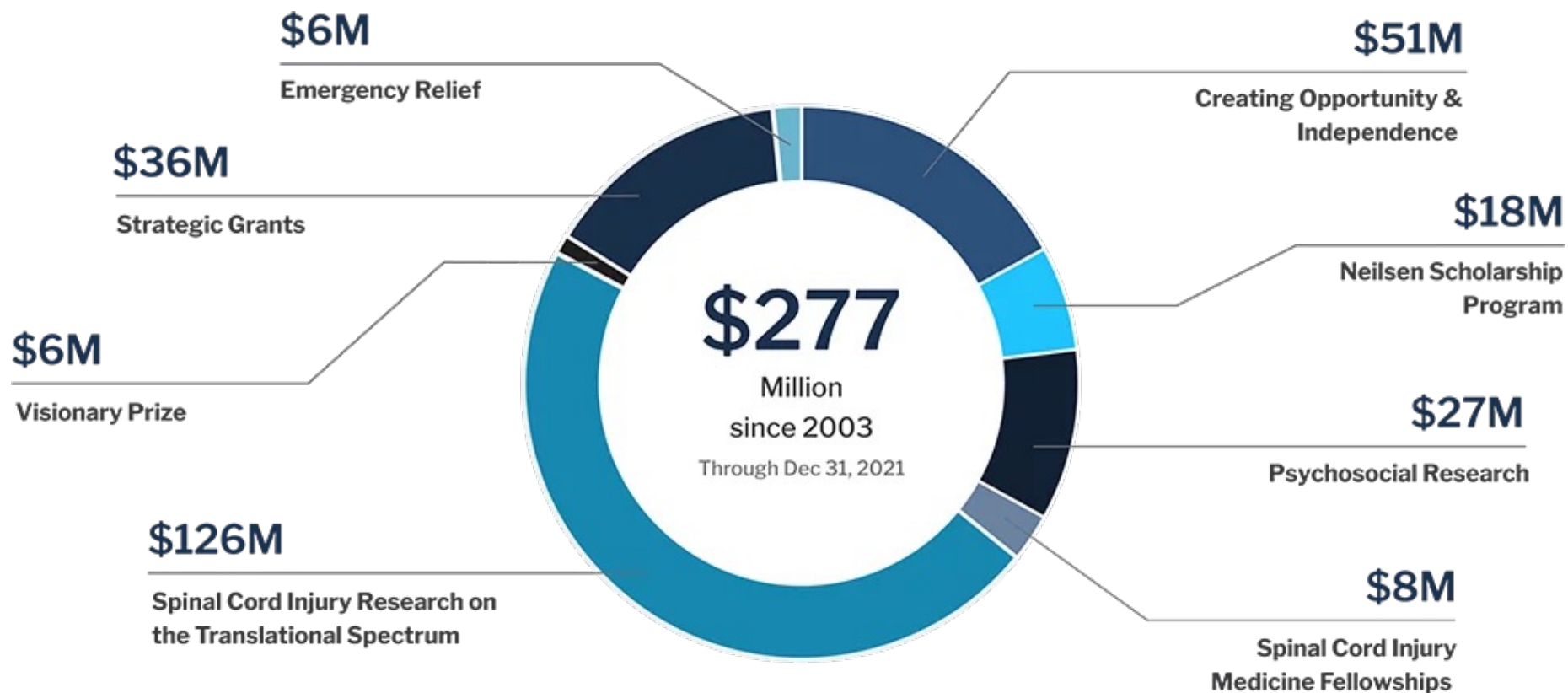
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  - [tracey@chnfoundation.org](mailto:tracey@chnfoundation.org)
- Constanza Svidler
  - [constanza@chnfoundation.org](mailto:constanza@chnfoundation.org)

Thank you!!!

# Funding Overview – Grant Numbers



# Funding Overview – Dollars



# The Congressionally Directed Medical Research Programs

## Overview & FY22 Funding Opportunities

HIGH-IMPACT RESEARCH



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**CDMRP**

Department of Defense



# About CDMRP



# Hallmarks



- ◆ Congress adds targeted research funds to the DOD budget
- ◆ Funds high-impact innovative research
- ◆ Avoids duplication with other funding agencies and targets unfunded/unmet gaps
- ◆ Funding opportunities publically announced and competed
- ◆ Follows the National Academy of Medicine-recommended model for application review
- ◆ Consumers participate throughout the process and are the “True North” and foundation of the programs
- ◆ Annually adapts each program’s vision and investment strategy allowing rapid response to changing needs
- ◆ Funding flexibility
  - ❖ Funds obligated up-front; limited out-year budget commitments
  - ❖ No continuation funding
  - ❖ No “pay line” – funding recommendations are based on portfolio composition, adherence to mechanism intent, relative impact, and technical merit
- ◆ Transparency and accountability to stakeholders
- ◆ Low management costs maximize research dollars

# CDMRP FY22 Appropriations

Research Program	FY22 \$M
Alcohol and Substance Abuse Disorders	\$4.0
Amyotrophic Lateral Sclerosis	\$40.0
Autism	\$15.0
Bone Marrow Failure	\$7.5
Breast Cancer	\$150.0
Chronic Pain Management	\$15.0
Combat Readiness Medical	\$10.0
Duchenne Muscular Dystrophy	\$10.0
Epilepsy	\$12.0
Hearing Restoration	\$10.0
Joint Warfighter Medical	\$40.0
Kidney Cancer	\$50.0
Lung Cancer	\$20.0
Lupus	\$10.0
Melanoma	\$40.0
Military Burn	\$10.0
Multiple Sclerosis	\$20.0
Neurofibromatosis	\$20.0

Research Program	FY22 \$M
Orthotics and Prosthetics Outcomes	\$20.0
Ovarian Cancer	\$45.0
Pancreatic Cancer	\$15.0
Parkinson's	\$16.0
Peer Reviewed Alzheimer's	\$15.0
Peer Reviewed Cancer (20 Topics)	\$130.0
Peer Reviewed Medical (50 Topics)	\$370.0
Peer Reviewed Orthopaedic	\$30.0
Prostate Cancer	\$110.0
Rare Cancers	\$17.5
Reconstructive Transplant	\$12.0
Spinal Cord Injury	\$40.0
Tick-Borne Disease	\$7.0
Toxic Exposures	\$30.0
Traumatic Brain Injury and Psychological Health	\$175.0
Tuberous Sclerosis Complex	\$8.0
Vision	\$20.0
<b>TOTAL = \$1.54 B</b>	

# Major Changes for FY22

- ◆ Overall CDMRP funding increased by \$43M
- ◆ No appropriation for Scleroderma Research Program (\$4M in FY21)
- ◆ New topic areas under Peer Reviewed Medical
- ◆ New Peer Reviewed Toxic Exposures Research Program (TERP)

## TERP Congressional language excerpt:

*“Transitioning related research to a new, broader program, including neurotoxin exposure treatment research, research on Gulf War illness, exposures to burn pits, and other service-related exposures to potentially toxic chemicals and materials will allow the research community to improve scientific understanding and pathobiology from exposure, more efficiently assess comorbidities, and speed the development of treatments, cures, and preventions.*

*Therefore, the agreement recommends \$30,000,000 for a peer-reviewed toxic exposures research program. The funds provided in this program are directed to be used to conduct research of clear scientific merit and direct relevance to neurotoxin exposure; Gulf War illness and its treatment; airborne hazards and burn pits; as well as toxic military exposures in general, including prophylactic medications, pesticides, organophosphates, toxic industrial chemicals, materials, metals, and minerals.”*

# FY22 Topic Areas for Peer Reviewed Cancer Research (20 total)

- ◆ Bladder Cancer
- ◆ Blood Cancer
- ◆ Brain Cancer
- ◆ Colorectal Cancer
- ◆ Endometrial Cancer
- ◆ Esophageal Cancer
- ◆ Germ Cell Cancers
- ◆ Head and Neck Cancers
- ◆ Liver Cancer
- ◆ Lymphoma
- ◆ Mesothelioma
- ◆ Metastatic Cancer
- ◆ Myeloma
- ◆ Neuroblastoma
- ◆ Pediatric, Adolescent and Young Adult Cancers
- ◆ Pediatric Brain Tumors
- ◆ Sarcoma
- ◆ Stomach Cancer
- ◆ Thyroid Cancer
- ◆ Von Hippel-Lindau Syndrome Malignancies (excluding cancers of the kidney and pancreas)



*Applicants must address at least one of these Topic Areas, as directed by Congress*

*Funds may not be used for research into breast, kidney, lung, ovarian, pancreatic, prostate, rare cancers, or melanoma*

*Research must be relevant to Service Members, their Families, Veterans, and other military beneficiaries*

The inclusion of the individual Rare Cancers Research Program *shall not* prohibit the PRCRP from funding the above mentioned cancers or cancer subtypes that may be rare by definition

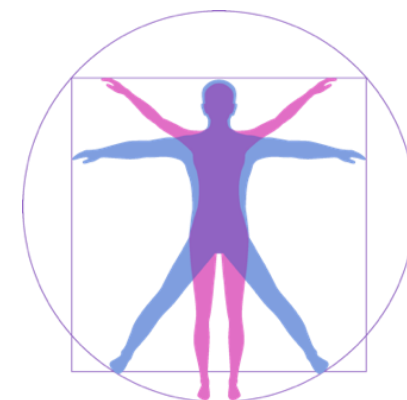
# FY22 Topic Areas for Peer Reviewed Medical Research (50 total)



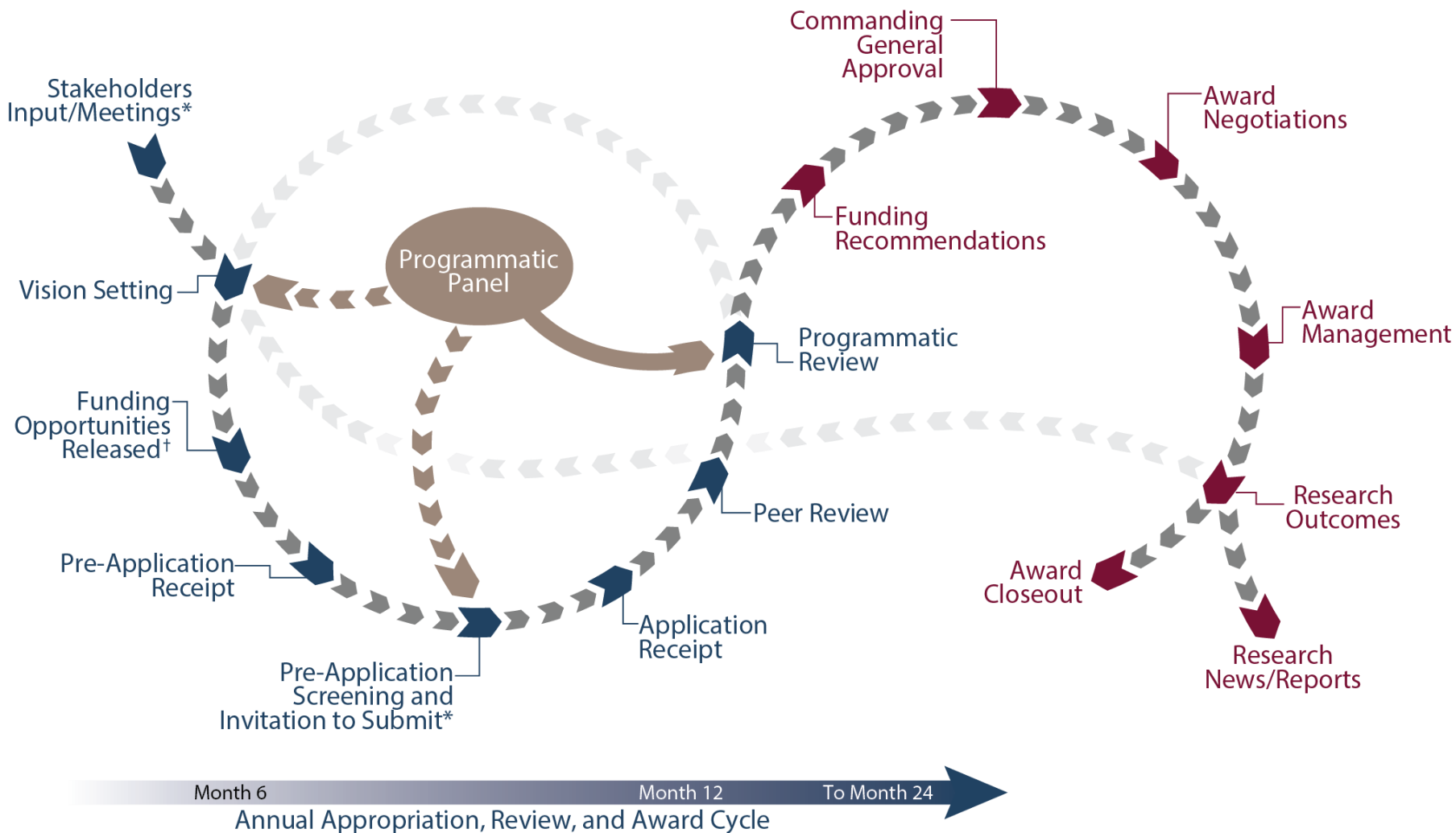
- ◆ Arthritis
- ◆ Cardiomyopathy
- ◆ Congenital Heart Disease
- ◆ Diabetes
- ◆ Dystonia
- ◆ Eating Disorders
- ◆ Ehlers-Danlos Syndrome\*
- ◆ Endometriosis
- ◆ Epidermolysis Bullosa
- ◆ Familial Hypercholesterolemia
- ◆ Fibrous Dysplasia
- ◆ Focal Segmental Glomerulosclerosis
- ◆ Food Allergies
- ◆ Fragile X
- ◆ Friedreich's Ataxia\*
- ◆ Frontotemporal Degeneration
- ◆ Guillain-Barre Syndrome\*\*
- ◆ Hemorrhage Control
- ◆ Hepatitis B
- ◆ Hydrocephalus
- ◆ Hypercholesterolemia\*
- ◆ Hypertension
- ◆ Inflammatory Bowel Diseases
- ◆ Interstitial Cystitis\*\*
- ◆ Malaria
- ◆ Mitochondrial Disease

- ◆ Musculoskeletal Disorders Related to Acute and Chronic Bone Conditions and Injuries\*
- ◆ Myalgic Encephalomyelitis/Chronic Fatigue Syndrome
- ◆ Myotonic Dystrophy
- ◆ Nephrotic Syndrome\*
- ◆ Non-Opioid Therapy for Pain Management
- ◆ Nutrition Optimization
- ◆ Pancreatitis\*\*
- ◆ Pathogen-Inactivated Blood Products
- ◆ Peripheral Neuropathy
- ◆ Plant-Based Vaccines
- ◆ Platelet-like Cell Production
- ◆ Polycystic Kidney Disease
- ◆ Pressure Ulcers
- ◆ Pulmonary Fibrosis
- ◆ Respiratory Health
- ◆ Rett Syndrome\*\*
- ◆ Rheumatoid Arthritis
- ◆ Sleep Disorders and Restriction
- ◆ Suicide Prevention
- ◆ Sustained Release Drug Delivery
- ◆ Trauma\*
- ◆ Vascular Malformations
- ◆ Viral Diseases (Previously Emerging Viral Disease)
- ◆ Women's Heart Disease

***Applicants must address at least one of these Topic Areas, which are directed by Congress***



# Program Cycle



\*As needed

†Pending Congressional appropriation

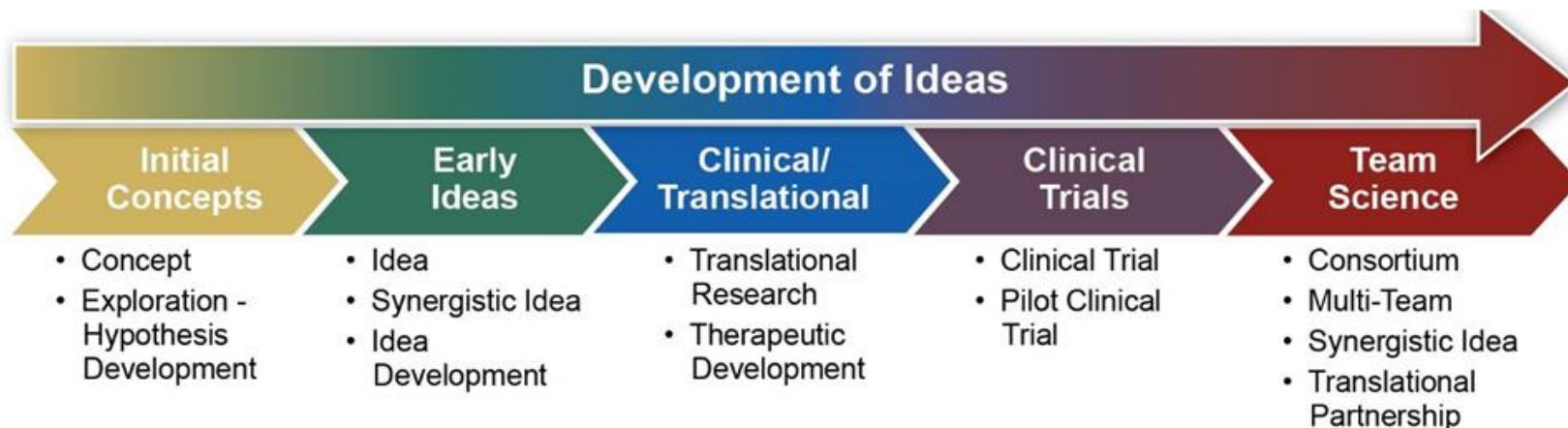
Month 18

**Awards Management**

To Month 84

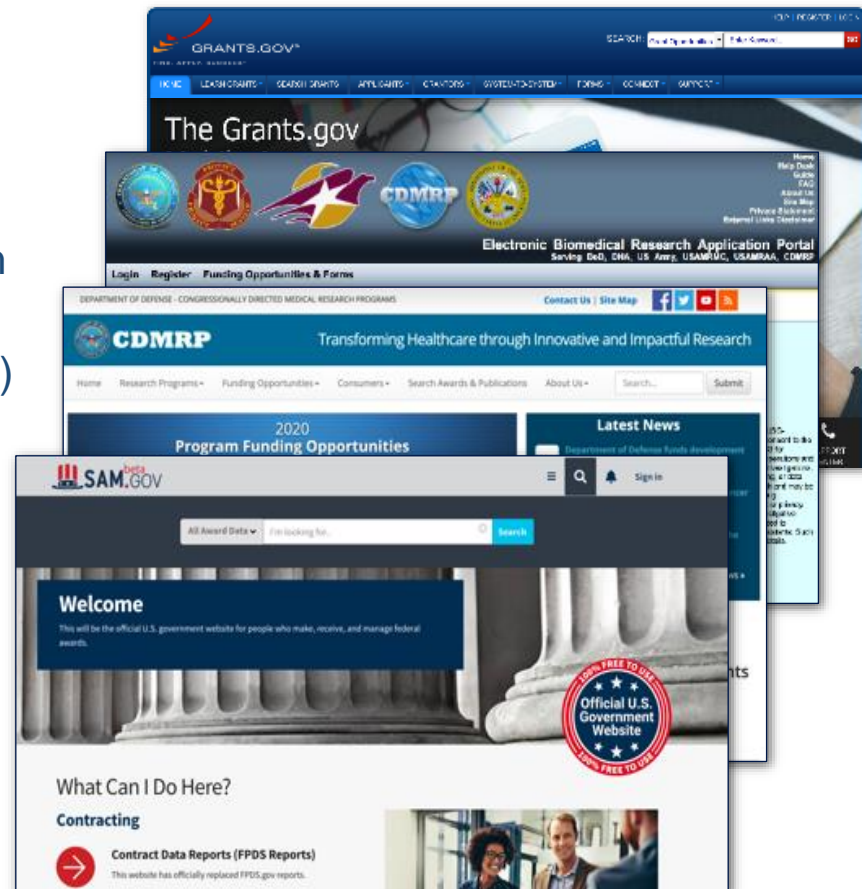
# Award Mechanisms

- ◆ Funding Opportunities are Program Announcements (PAs) or program-specific Broad Agency Announcements (BAAs)
  - ❖ Grants/Cooperative Agreements (few contracts, OTAs)
- ◆ Numerous types of award mechanisms
  - ❖ Tailored to the goals of each program
  - ❖ Programs, topics, and focus areas may vary from year to year
  - ❖ Fund the full continuum of research



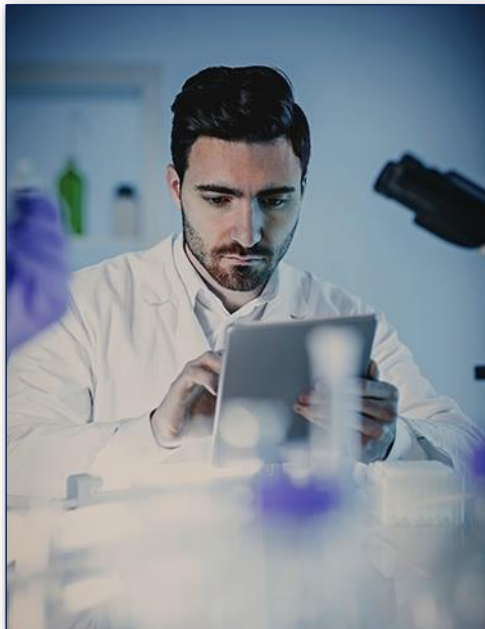
# Funding Opportunities

- ◆ Pre-announcements and funding opportunity release notifications
  - ❖ CDMRP website and email blasts
  
- ◆ Funding opportunity postings
  - ❖ Grants.gov (CFDA 12.420)
  - ❖ electronic Biomedical Research Application Portal (eBRAP) system (ebrap.org)
  - ❖ CDMRP website (cdmrp.health.mil)
  - ❖ SAM.gov (BAAs)



# Applying for Funding

Understanding the goals of the program, intent of the award mechanism, and review criteria is critical for a successful grant application



◆ The announcement (PA or BAA) contains information on:

- ❖ Program Goals
- ❖ Focus Areas
- ❖ Award Intent
- ❖ Required Elements, Eligibility, and Funding
- ❖ Review Criteria
- ❖ Deadlines

Single most important tip:  
Read the announcement carefully

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## 2020 Program Funding Opportunities

Prostate Cancer

## Latest News

- TBDRP** Department of Defense funds development of a new Lyme disease vaccine [↗](#)  
Baylor College of Medicine, November 20, 2020
- LCRP** The lung microbiome may affect lung cancer pathogenesis and prognosis [↗](#)  
EurekAlert!, November 20, 2020
- JPC-6 PHTBI** Portable MRI Device Brings Imaging to the Battlefield and Bedside [↗](#)  
USA MRDC November 13, 2020

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WHERE DISCOVERIES BEGIN



# **Disability and Rehabilitation Engineering (DARE) Research at the National Science Foundation**

Engineering Directorate (ENG)

Chemical, Bioengineering, Environmental, and Transport Systems (CBET)  
Division



**Grace M. Hwang, Ph.D.  
Program Director, PD  
DARE**

September 29, 2022





WHERE DISCOVERIES BEGIN



# NSF Supports Disability & Rehabilitation Research

From the NSF Proposal & Award Policies & Procedures Guide (PAPPG):

*Biological research on mechanisms of disease in humans, including on the etiology, diagnosis, or treatment of disease or disorder, is normally not supported. . [...] **However, research with etiology, diagnosis- or treatment-related goals that advances knowledge in engineering, mathematical, physical, computer, or information sciences is eligible for support. Bioengineering and assistive information technology research to aid persons with disabilities also is eligible.***

[Disability and Rehabilitation Engineering \(DARE\)](#) | [CBET](#) | [ENG](#) | [NSF](#)



WHERE DISCOVERIES BEGIN



# NSF Supports Disability & Rehabilitation Research

From the Disability and Rehabilitation Engineering (DARE) Program  
Description:

The **DARE** program supports fundamental engineering research that will improve the quality of life of persons with disabilities through: the development of new technologies, devices, or software combined with advancement of knowledge regarding healthy or pathological human motion, or advancement in understanding of injury mechanisms.

NSF does not support clinical trials, however, feasibility studies involving human volunteers may be supported if appropriate to the project objectives.



WHERE DISCOVERIES BEGIN



# Disability & Rehabilitation Engineering (DARE)

## Program Objectives:

- Develop fundamental understanding, technologies, & models to improve the quality of life of persons with disabilities - cognitive, sensory, physical, others
- Support research directed to the characterization, restoration, and/or substitution of human functional ability or cognition
- Novel engineering approaches to understanding human motion
- Understanding injury at the tissue or system-level

## Key Components:

- Fundamental engineering research
- Transformative outcomes
- High-risk/High-reward

## Typical award (2-3 years)

1 PI	200-300K
2 PIs	400-440K



Grace Hwang  
[ghwang@nsf.gov](mailto:ghwang@nsf.gov)



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# Origin of the DARE Program

1972

PL 93-112  
Rehabilitation  
Act of 1972

**Congressman  
from TX**



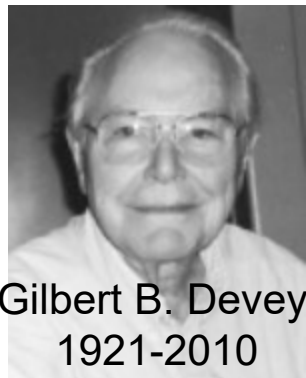
Olin Earl Teague  
1910-1981

1978

PL 95-434  
Congress  
authorized  
a Handicapped  
Research  
Program:  
**Science  
& Technology  
to Aid the  
Physically  
Disabled  
(STAPH)**

1980

STAPH was  
renamed to  
**Research to  
Aid People  
with Disability  
(RAPD)**



Gilbert B. Devey  
1921-2010

~2010

RAPD was  
renamed to  
**General and  
Age-Related  
Disabilities  
Engineering  
(GARDE)**

2006-2008: Robert  
J. Jager, currently  
at NIDILRR  
2008-2010:  
Ted A. Conway

2018

GARDE was renamed to  
**Disability and Rehabilitation  
Engineering (DARE)**

2010-2014: Ted A. Conway  
2014-2016: Alex Leonessa  
2016-2018: Michelle J. Grimm  
2019-2020: Aleksandr Simonian  
2020-now: Grace M. Hwang



WHERE DISCOVERIES BEGIN



# DARE Presidential Early Career Awards for Scientists and Engineers (PECASE) Awardees

1997

CAREER:

**Mechanical**

Function of  
Residual Stresses  
in Anulus  
Fibrosus  
9703299

1998

CAREER:

Universal Access  
to the Graphical  
User Interface:  
Design for the  
**Partially Sighted**  
0196030

2010

CAREER: Using  
Control Systems  
to Quantify Limbic  
Dysregulation for  
**Neurobiologically-**  
Based Diagnoses  
of Psychiatric  
Disabilities.  
0954643

2012

CAREER:  
Advancing  
Treatment of **Pelvic  
Floor Disorders**  
through Discoveries  
in Elasticity and  
Viscoelasticity of  
Uterosacral and  
Cardinal Ligaments.  
1150397



WHERE DISCOVERIES BEGIN



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## Rehabilitation Research at NSF



Image credit: Auttapon Wongtakeaw/Shutterstock.com.

NSF has many funding opportunities for research related to rehabilitation.

<https://www.nsf.gov/eng/rehab.jsp>



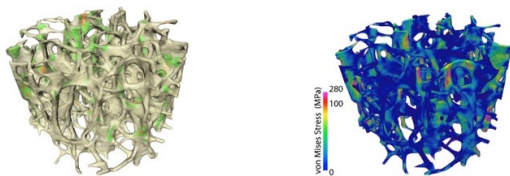
WHERE DISCOVERIES BEGIN



## Programs supporting rehabilitation research

### Biomechanics and Mechanobiology (ENG/CMMI/BMMB)

The BMMB program supports fundamental research in biomechanics and mechanobiology. The program emphasizes multiscale mechanics approaches that integrate across molecular, cell, tissue, and organ domains in the study of organisms. Projects may include theoretical, computational, and experimental approaches. Projects relevant to rehabilitation are welcome.



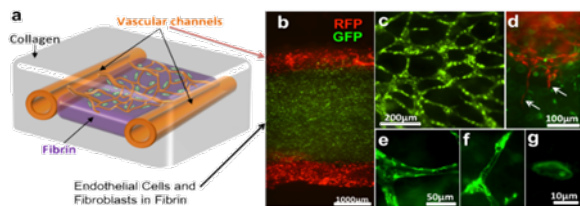
New understanding of bones could lead to stronger engineered materials for osteoporosis treatment

PD: Laurel Kuxhaus, PhD; lkuxhaus@nsf.gov

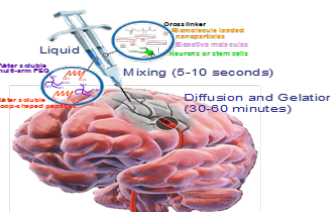
### Engineering of Biomedical Systems (ENG/CBET/EBMS)

The EBMS program supports research projects that integrate engineering and life sciences to solve biomedical problems and serve humanity in the long term. Projects use an engineering framework (for example, design or modeling) that supports increased understanding of physiological or pathophysiological processes. Areas include: methods, models, and enabling tools applied to understand or control living systems; fundamental improvements in deriving information from cells, tissues, organs, and organ systems; or new approaches to the design of systems that include both living and non-living components for eventual medical use.

PD: Stephanie George, PhD; stgeorge@nsf.gov



*In vitro* vascularization



*CNS Regeneration*



### Mind, Machine and Motor Nexus (ENG/CMMI/M3X)

The M3X program supports fundamental studies of bidirectional dynamic interactions between humans and intelligent machines. Interactions between humans and assistive devices are within the scope of M3X, however the focus of an M3X project should be on emergent behavior arising from dynamic interactions, rather than on advances in rehabilitation technologies.

PD (temporary): Alex Leonessa, PhD; aleoness@nsf.gov

<https://www.nsf.gov/eng/rehab.jsp>



WHERE DISCOVERIES BEGIN



Understanding the Brain



Researchers use genetics and optics to control brain cell activity

## Cross-directorate programs

### Collaborative Research in Computational Neuroscience (CRCNS)

The CRCNS program supports collaborative activities that advance understanding of nervous system structure and function, mechanisms underlying nervous system disorders, and computational strategies used by the nervous system, including Research Proposals describing collaborative research and Data Sharing Proposals to enable sharing of data and other resources. Domestic and international projects will be considered. Funders include NSF, NIH, DOE, and partners in Germany, France, Israel, Japan, and Spain.

- Joint with NIH, DoE, and international partners
- Must relate to computational neuroscience – from synapse through cognition/behavior
- Can include clinically relevant projects
- PD: Ken Whang, PhD; [kwhang@nsf.gov](mailto:kwhang@nsf.gov)
- Next due date: 11/22/2022

### Integrative Strategies for Understanding Neural and Cognitive Systems (NCS)

The NCS program calls for innovative, convergent, boundary-crossing proposals seeking to understand complex aspects of neural and cognitive systems through integrative multidisciplinary approaches. NCS projects advance the foundations of one or more of the following areas: 1) Neuroengineering and Brain-Inspired Concepts and Designs; 2) Individuality and Variation; 3) Cognitive and Neural Processes in Realistic, Complex Environments; and 4) Data-Intensive Neuroscience and Cognitive Science. Projects relevant to rehabilitation are welcome.

FY23 Frontier and Foundation competition due date: 2/15/2023

Questions, email [ncs@nsf.gov](mailto:ncs@nsf.gov)

<https://www.nsf.gov/eng/rehab.jsp>



WHERE DISCOVERIES BEGIN



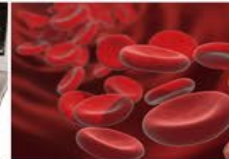
# Key consideration for Intellectual Merit (IM)

1. What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields?
2. To what extent do the proposed activities suggest and explore creative, original, high-risk/high-payoff, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?



## Key consideration for Broader Impact (BI)

1. Broader Impacts do not need to be innovative
2. There is no checklist, e.g., the impact of the research itself may be sufficient
3. There is no requirement that a proposal addresses any particular item on the example list, e.g., K-12/STEM education, diversity, underrepresented minorities, outreach, but these types of activities are encouraged
4. DARE strongly encourages the inclusion of trainees with disabilities and participatory design
5. Useful link on BI:  
<https://www.nsf.gov/pubs/2002/nsf022/bicexamples.pdf>



# One-page Whitepaper

## Overview

- What is the problem?
- Why should we care?
- What's the proposed solution?
- What's the potential impact?
- Why is the PI/Team the best to do this work?

## Intellectual Merit

- What high-risk/high-reward innovation or transformative fundamental science are you proposing to advance?
- What are competing scientific methods and the current state-of-the-art? How is your innovation significantly better, and what scientific obstacles/barriers does it overcome?
- What is your high-level research plan? Highlight just the major milestones. How will success be assessed?
- The preliminary evidence you have that can convince reviewers that although the proposed research is high risk and innovative, there is indication that it has a chance to succeed!

## Broader Impact (optional during white paper phase)

- Describe the activities that will advance the project's objectives to have broad impact
- DARE strongly encourages the inclusion of trainees with disabilities and participatory design
- Discuss how success of impact will be addressed

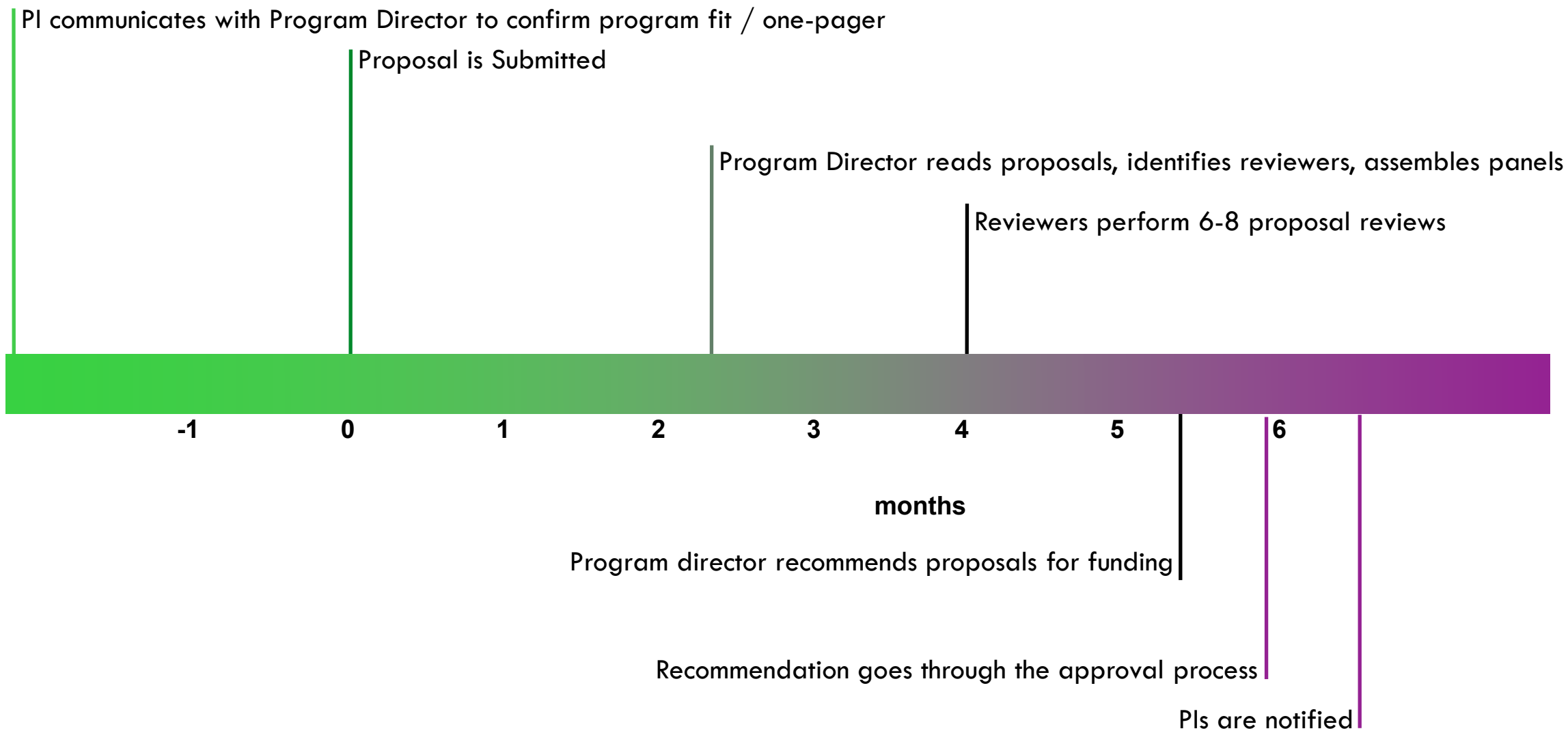




WHERE DISCOVERIES BEGIN



# Approximate Review Timeline





WHERE DISCOVERIES BEGIN



## NSF vs. NIH

- Advancement of foundational knowledge
  - Engineering projects will involve some translation
  - Feasibility studies – may include limited human volunteers
  - Budgets in ENG are typically ~\$100k/year (Direct + Indirect Costs); higher budgets allowed
- Basic research
  - Translational research with direct medical applications
  - Much larger budget possibilities for most funding mechanisms
  - Budget limits are typically for Direct costs only.
- *The structure of NSF and NIH proposals is different!*
    - *(Reviewers recognize a cut-and-paste....)*

Proof of concept

*...totally different proposals....*

Proof of practice



WHERE DISCOVERIES BEGIN



## Key take-home messages

- Understand the goals and requirements of the program. Locate the program description **and read it thoroughly and carefully. Look at recently funded proposals for additional insight.**
- Contact the program director early. Get to know your program director!
- **NSF does not support clinical trials, however, feasibility studies involving human volunteers may be supported if appropriate to the project objectives.**



## Become a Reviewer

- Learn and understand the merit review process
- Read good proposals and see other ways of writing proposals
- Read about and discuss interesting leading-edge work
- Network with other experts in your field
- Provide service to the science and innovation community

**How? Reach out to Program Directors from divisions close to your expertise and volunteer.**



WHERE DISCOVERIES BEGIN



**Thank you for your attention!**  
**Grace Hwang**  
**[ghwang@nsf.gov](mailto:ghwang@nsf.gov)**