

**MCKNIGHT BRAIN RESEARCH FOUNDATION (MBRF)
Meeting of the Research Committee of the Board of Trustees**

**Thursday, March 12, 2020
5:00 pm – 6:00 pm EDT**

Conference Call Number 877-934-2901 Passcode 8630398

Members: Dr. Madhav Thambisetty, Committee Chair; Dr. Robert Krikorian; Dr. Richard Isaacson; Dr. Sue Pekarske; and Dr. Mike Dockery, MBRF Chair

Also Attending: Ms. Amy Porter, Ms. Melanie Cianciotto

AGENDA

- | | | |
|--------------------|---|-----------------|
| 5:00 pm EDT | 1. Call to Order/Roll Call | Dr. Thambisetty |
| | 2. Research Committee Activity Timeline included For Information Only | Dr. Thambisetty |
| | 3. Pilot Grant Progress Reports
a. Update on a possible no-cost extension for the University of Florida, Dawn Bowers, PhD, "Revitalizing Cognition in Older Adults"
b. Final Report from University of Miami, Bonnie Levin, PhD, due April 30, 2020 – on target but not yet submitted | Ms. Cianciotto |
| | 4. New Grant Program
Suggested title: <i>Evelyn F. McKnight Mid-Career Research Accelerator Award in Cognitive Aging</i> | Dr. Thambisetty |
- ACTION**
- a. Discuss and develop a formal statement describing the MBRF's priority focus on mid-career scientists carrying out clinical translational research in cognitive aging.

Notes from the Chairman:

The main mechanism of MBRF's current portfolio of supported investigator-led research is through its pilot grant awards made to researchers from the individual MBIs, the AAN clinical translational research scholarships and through funding stand-alone projects arising from unsolicited requests from MBI faculty. The remainder of our portfolio is distributed as endowments to the MBIs supporting Chairs, block grants supporting key priority areas through inter-MBI initiatives and the FNIH gift supporting specific NIA-led research initiatives. A significant gap in our portfolio is the lack of support to mid-career investigators who have a proven track record of research accomplishments in cognitive aging. These are scientists who have:

- completed research/clinical training i.e. formal post-doctoral research training post-PhD and/or physicians who have completed post-residency fellowship training

- a proven track record of research accomplishments in cognitive aging as indicated by their publication record
- been recently hired as tenure-track faculty in an academic institution with evidence of long-term institutional support as indicated by commitment of resources including laboratory space, start-up research funds and personnel

This group of scientists is at a key milestone in their career trajectory as they have already proven themselves to be committed to research in cognitive aging and have demonstrated potential to become leaders in their field.

The proposed MBRF initiative would add substantial start-up support for a period of 3 years to these investigators to develop clinical translational research into cognitive aging. This support could be deployed towards developing proof-of concept interventions to ameliorate age associated cognitive impairment, gather preclinical data to accelerate testing of potential interventions, further study the mechanistic basis of age-associated cognitive impairment with a view to identifying novel treatment targets etc.

Why is funding research in this area is important to the MBRF and its mission?

If we are to accelerate progress towards interventions against age associated cognitive impairment, we must support the most promising investigators at a key stage in their careers when they are about to launch their careers as independent scientists. While supporting post-doctoral researchers is important, these are investigators at early stages in their careers, who are still in training and may not be committed to research careers in cognitive aging. Supporting senior scientists who are full professors or Chairs may target scientists who are not motivated to take on high-risk projects or paradigm-shifting research.

Agenda (continued)

ACTION

- Discuss and develop a "Funding Opportunity Purpose" statement for the new grant award
- Discuss Eligibility; Application and Submission Information, and Award Information
- Discuss the Peer Review Process and other steps in the review of applications and notification of the awards
- Outline Next Steps and Timeline

Notes from the Chairman:

Can we identify a partner organization such as the AAN/ABF partnership that can manage the awards? One such organization may be PCORI -Patient-Centered Outcomes Research Institute. Please see link below for more information about PCORI and their goals:

<https://www.pcori.org/about-us/our-programs>

Also attached are some fact sheets that summarize some of their funded studies including those from Florida (includes a grant to UF). It is glaring that there is no specific priority area relevant to Aging! Could this be a gap that we could help them fill and, in return, partner strategically with PCORI to develop a highly visible research award program supporting mid-career scientists working on clinical translational research in cognitive aging?

Another iconic institution with stellar credentials of funding the best biomedical research is the Howard Hughes Medical Institute whose support has funded 28 Nobel laureates to date. The HHMI strikingly states that “we support people, not projects.” The HHMI supports basic science research and funds investigators generously (\$8 million over a 7-year period). The vision statement (attached) reads: *HHMI catalyzes discovery in basic biomedical research, generating knowledge about the structure and function of living systems at the level of molecules, cells, behaviors, and interactions, with potential to benefit humanity. We place big bets on curious and ambitious researchers, supporting them with generous and flexible funding for significant periods of time, subject to rigorous periodic scientific review.*

Please see the link below to the HHMI:

<https://www.hhmi.org/about>

The HHMI investigator funding program has a similar target population i.e. mid-career scientists. Their program is called the ‘Investigator Program’ and the current call for applications is open. This link has more details:

<https://www.hhmi.org/programs/biomedical-research/investigator-program>. I also attach the program announcement.

One idea worth considering and discussing would be whether we want to fund one scientist at each end of the research spectrum i.e. clinical translational where the focus is on developing/testing interventions for cognitive aging (think of an Adam Woods-type of scientist starting on their first position as a tenure track faculty) in partnership with PCORI. The second investigator would be at the basic science end of the spectrum (think of a Carol Barnes-type of scientist starting on their first position as a tenure track faculty) in partnership with HHMI.

**6:00 pm EDT
ACTION**

5. Adjourn

Dr. Thambisetty
All

Research Committee Activity Timeline
For the One-Year Period July 1, 2019, to June 30, 2020
Updated March 2020

Duty (from Committee Charter)	Activity/Action	Outcome	Date	Comments
"Encourage and assess research at the McKnight Brain Institutes (MBIs)"	Review of the Annual Reports of the MBIs	Information for scientific review includes: scientific achievements, publications, presentations, collaborations	February 5, 2020	Reports were submitted mid-January. Reviewers presented at Feb 5 Trustees Meeting. Follow up letters were written to each of the MBIs. Waiting for response on items raised.
	Review of all New Funding Requests from MBIs	UM has submitted an adjusted request for \$200,000 for pilot funding for a Neurocognitive Post-Doctoral Fellowship over the next two years	October 23, 2019 Trustees voted to fund -- payable over two years. Drs. Sacco and Rundek received a notification letter from Dr. Mike Dockery. The notification letter indicated that future funding should come from other sources.	The request for a gift to establish a fund to support the fellowship in perpetuity was a component of the "Investing in the Future" request considered at the July 2019 Trustees' Meeting
		UA submitted a request for \$244,400 for UM's participation in the Precision Aging Demonstration Pilot	The proposal was reviewed and approved by the Trustees on Feb 5, 2020	Dr. Mike Dockery notified UA of the Trustees' approval

Duty (from Committee Charter)	Activity/Action	Outcome	Date	Comments
	Review of Travel Award Fund: Originally established to fund research scholars and faculty to visit other McKnight institutions.	Few applications for travel. The funds allocated for travel have been used to fund the activities of focus groups: Epigenetics, MRI standardization and cognitive test battery working group	Reviewed at each Trustees' Meeting	Approved in 2009 In the amount of \$100,000 Approximately \$30,000 remains in the fund
"Encourage and assess research at the McKnight Brain Institutes (MBIs)" continued	Inter-institutional Block Grants	Cognitive Aging Core Working Groups	N/A	5 Areas: Brain and Cognitive Health Cognitive Aging & Memory Cognitive Testing Battery Epigenetics MRI standardization
	Inter-institutional Block Grants	Bio-Informatics Core (Epigenetics)	Funding period: 9/1/2013-8/31/2015	Tom Foster, UF still lead scientist. \$76,276.49 still unexpended funds
	Inter-institutional Block Grants	Neuroimaging Core	Funding period: 1/1/2015 to 12/31/2017 \$931,759.00	Remaining balance: \$514,229.21
	Inter-institutional Block Grants	Cognitive Assessment and Brain Registry Core	Funding period: 9/1/2015-8/31/2017 Request for another extension was reviewed and approved at the Feb 5 Trustees meeting.	No-cost extension was provided until December 2021 Remaining Balance: \$101,275.15

Duty (from Committee Charter)	Activity/Action	Outcome	Date	Comments
	Review of Pilot Grants (Funding Requests and Progress Reports)	A Novel Invention Tool – Levin Revitalizing Cognition in Older Adults – Bowers Transcutaneous Vagal Nerve Stimulation and Cognition Training – Williamson/Alexander	Funding Period: 5/1/2018-4/30/2020 Funding period: 5/1/2018-4/30/2020 Approved July 2019 Funding period: 10/1/2019-9/30/2021	Funding for 2-years for total of \$120,000 Progress Report – May request a No Cost Extension Funding for 2-years for total of \$120,000 Progress Report --on Target Funding for 2-years for total of \$120,000
<i>"Identify opportunities...to foster greater interest in cognitive aging and age- related memory loss (in the scientific community)"</i>	Research Partnership with the Foundation for NIH and the National Institute of Aging. 1 st cycle-2009, 2 nd cycle 2014, 3 rd cycle approved 2019 to begin Spring of 2020	Fund balance of \$1 million from 2 nd five-year partnership returned to MBRF Report received on all FNIH/MBRF activities RFA posted: "Network for Identification, Evaluation, and Tracking of Older Persons with Superior Cognitive Performance for Age"	August 2019 FNIH Report in October 2019 had error. A corrected report resubmitted on Feb. 5, 2020. Posted Feb 2020; Deadline LOI Sept. 1; Application October 1, 2020	History: Established 2009 \$5 M over 5 years from MBRF; match from NIA and partners was \$23 M for total of \$28 M (17 five-year grants funded). 2014 Partnership renewal funded one 5-year project for \$15 million with \$5 M from MBRF and \$10 M from NIA RFA was shared with Communications Working Group for posting and with Leadership Council.

Duty (from Committee Charter)	Activity/Action	Outcome	Date	Comments
			Payment due to FNIH by March 31, 2021 -2025	NIA will provide \$14M to be pooled with MBRF \$5 M. A 2.8 Match.
	Cognitive Aging Conference (CAC) 2020	Through Dr. Thambisetty, MBRF requested information about sponsoring a panel and/or poster session reception Proposal Expected from CAC	Discussions took place in April & July 2019 No proposals were received. CAC 2020 scheduled for April 16 – 19 Atlanta JW Marriott in Buckhead	MBRF sponsored a successful panel at Cognitive Aging Conference May 2018 No MBRF representation will be at CAC
	Reserve & Resilience Workshop 2019	Over 300 Attendees (8 MBI researchers) Report requested from organizers; List of attendees to be provided Next Reserve & Resilience Workshop	September 9 and 10 th , 2019 Bethesda September 14 and 15, 2020, Bethesda	Outcome from Cognitive Aging Summit III held in 2017 The Leadership Council and CWG Members were alerted of 2020 dates
"Encourage young investigators in this area of research"	McKnight Brain Research Foundation Clinical Translational Research Scholarship with American Academy of Neurology (AAN) and American Brain Foundation (ABF)	12 applications were received – great improvement over 4 applications last year	Reviewers met in Dec. Two Scholars were selected and alternates were identified. Awardees were notified in January. Both accepted the awards. AAN will issue Public Notice in late April 2020.	First Scholarships Awarded January 2018 (McConnell, Albert) Second Scholarships Awarded January 2019 (Camargo, Sedaghat) Third Scholarships Awarded January 2020 (Baxter, Getz)

		Discuss changes to RFA for 2021 Changes to RFA were submitted to AAN/ABF for new application along with new MBRF logo Draft of RFA will be provided by AAN for review by Chair of Research Committee	Funding starts July 1 of each cycle	Fourth Scholarships will be Awarded in January 2021 Fifth Scholarship will be awarded in January 2022
		Dr. Robert Krikorian has agreed to be the 4th Reviewer with Drs. Thambisetty, Isaacson, O'Brien in 2020.		
		Dinner with the McKnight Scholars will be held at next AAN meeting in Toronto (Also see Education committee Timeline)		
		72nd Annual AAN Meeting April 25 – May 1, 2020 Toronto	Dinner for Scholars Scheduled for April 27 At Canoe Restaurant MBRF Trustees planning to attend AAN will be invited	The MBRF approved \$4,000 in funding to support hosting of McKnight Scholars, MBI and MBRF Leadership for reception/dinner/orientation

Cianciotto.Melanie

From: Madhav Thambisetty <madhavtr71@gmail.com>
Sent: Tuesday, March 10, 2020 12:16 PM
To: Amy Porter
Cc: KRIKORR@UCMAIL.UC.EDU; Richard Isaacson; Mike Dockery; Sue Pekarske; J Lee
Subject: Re: Research Cmte 3 of 3

Dear Amy,
Thanks a lot for formatting my notes and making them readable. I wanted to add the following about the HHMI initiative which in 2016 partnered with the Bill and Melinda Gates Foundation as well as the Simons Foundation to fund their New Faculty Scholars' awards.

Please see a short video by Dr. Erin O'Shea, the Chief Scientific Officer of HHMI describing this award here:

<https://vimeo.com/123350599>

Thanks again!

Madhav

On Tue, Mar 10, 2020 at 12:01 PM Amy Porter <aporter@mcknightbrf.org> wrote:

Attached you'll find information about the Howard Hughes Medical Institute as mentioned by Dr. Thambisetty in his notes in the meeting agenda.



PATIENT-CENTERED OUTCOMES RESEARCH INSTITUTE

PCORI funds research to help patients choose healthcare options that best meet their needs

1828 L STREET NW, SUITE 900
WASHINGTON, DC 20036
202.827.7700

STATE PORTFOLIO

Maryland

84
PROJECTS*

\$155
MILLION
AWARDED

**Including 36 research projects, 43 projects that support engagement in research, and 5 awards to build research infrastructure. As of April 2019.*



STUDY SPOTLIGHT: CARDIOVASCULAR HEALTH

Comparing Ways to Reduce High Blood Pressure in People from Different Backgrounds

This project, based at Johns Hopkins University, aims to help lower blood pressure and heart disease risk among racial/ethnic minority, low income, and rural populations—groups more likely to have high blood pressure and worse health care outcomes than the general population. Researchers are comparing standard clinical performance feedback and education for providers and staff with a more comprehensive approach that includes workshops for health system leaders, a structured team approach to care, and access to community health worker support as needed for patients with hypertension.

AWARDEE AND COMMUNITY PARTNERS INCLUDE

- East Baltimore Collaborative
- Hugo W. Moser Research Institute at Kennedy Krieger Institute
- Johns Hopkins University
- Medical Technology and Practice Patterns Institute
- MedStar Health Research Institute
- Men and Families Center
- Sisters Together and Reaching
- Society for Healthcare Epidemiology of America
- University of Maryland
- YMCA of Maryland

CONDITIONS STUDIED INCLUDE



Asthma



Epilepsy



High Blood Pressure



Multiple Chronic
Conditions



Multiple Sclerosis

PROJECTS FUNDED IN MARYLAND INCLUDE:

RESEARCH PROJECTS

Training Scientists to Conduct Patient-Centered Outcomes Research within Learning Health Systems	Agency for Healthcare Research and Quality	\$30 M
A Pragmatic Trial to Evaluate Effects of Early, Aggressive versus Escalation Therapy in People with Multiple Sclerosis	Johns Hopkins University	\$13 M
Comparing Ways to Reduce High Blood Pressure in People from Different Backgrounds	Johns Hopkins University	\$13 M
Comparing Medicines that Prevent Blood Clots for Emergency Room Patients with Serious Fractures	University of Maryland, Baltimore	\$11 M
Pragmatic Randomized Trial Evaluating Preoperative Antiseptic Skin Solutions in Fractured Extremities	University of Maryland, Baltimore	\$11 M
A Multicenter Randomized Controlled Trial of Perioperative Palliative Care Surrounding Cancer Surgery	Johns Hopkins University	\$2.1 M
Comparing Effectiveness of Self-Management and Peer Support Communication Programs among Chronic Obstructive Pulmonary Disease Patients and Their Family Caregivers	Johns Hopkins University	\$2.1 M
Comparing Three Medicines to Treat Fatigue in Patients with Multiple Sclerosis	Johns Hopkins University	\$2.1 M
The Impact of Self-Management with Probiotics on Urinary Symptoms in Individuals with Spinal Cord Injury and Spina Bifida	MedStar Health Research Institute	\$1.8 M
A Randomized Trial of Family Navigator Services versus Usual Care for Young Children Treated with Antipsychotic Medication	University of Maryland, Baltimore	\$1.5 M
Utilizing Advance Care Planning Videos to Empower Perioperative Cancer Patients and Families	Johns Hopkins University	\$1.5 M

RESEARCH INFRASTRUCTURE PROJECTS

Rare Epilepsy Network (Phases I and II)	Epilepsy Foundation	\$2.7 M
Primary Immunodeficiency Patient Research Connection (Phases I and II)	Immune Deficiency Foundation	\$2.5 M

ENGAGEMENT IN RESEARCH PROJECTS

Patient Empowerment through Engagement Research Training in Bladder Cancer	Bladder Cancer Advocacy Network	\$250,000
Strengthening Diversity in Research Partnerships: Knowledge to Action	Institute for Patient and Family Centered Care	\$250,000
The National Sickle Cell Advocate Network	Sickle Cell Disease Association of America	\$250,000
Summit: Leveraging the Power of Patient and Consumer Advocacy to Transform Health Care	Johns Hopkins Bloomberg School of Public Health	\$250,000
PCOR Training: A Program for Rare Disease Patient Advocates	University of Maryland	\$250,000
Bladder Cancer Patient Survey Network for Research Prioritization	Bladder Cancer Advocacy Network	\$120,000
Improving Outcomes for Children with Mental Health Challenges and Their Families through Parent-to-Parent Peer Support (Tiers I, II, and III)	Family-Run Executive Director Leadership Association	\$90,000
Developing a Student/Family-Centered School Health Collaborative (Tiers I, II, and III)	National Association of School Nurses	\$90,000
Engaging an Underserved Patient Community to Inform and Improve Comparative Effectiveness Research for Hepatitis C Treatments	University of Maryland, Baltimore	\$50,000
Building Capacity for and Reducing Barriers to the Inclusion of Underserved Black Youth and Families in Behavioral and Mental Health Patient-Centered Outcomes Research	Balance and Life Ministries, LLC	\$15,000



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1828 L STREET NW, SUITE 900
WASHINGTON, DC 20036
202.827.7700

STATE PORTFOLIO

Florida

51
PROJECTS*

\$61.6
MILLION
AWARDED

**Including 13 research projects, 29 projects that support engagement in research, and 9 awards to build research infrastructure. As of November 2019.*



STUDY SPOTLIGHT: CARE TRANSITIONS

Care Transitions Intervention to Reduce Hospital Use

The transition home after an emergency department (ED) visit, if poorly managed, can lead to hospital admissions or a return to the ED. This is especially true for patients with chronic medical conditions. This University of Florida-based project compared a community-based system of social support and medical follow-up with the usual ED practice of verbal and written discharge instructions. Compared with patients who followed the usual ED practice, patients in the community-based group were less likely to have a hospital stay if they did return to the ED.

AWARDEE AND COMMUNITY PARTNERS INCLUDE

- Caring Ambassadors
- Center for Independent Living of North Central Florida
- COPD Foundation
- Florida Department of Health
- Florida Medical Quality Assurance, Inc.
- Harm Reduction Coalition
- Moffitt Cancer Center
- Northeast Florida Area Health Education Center
- 100 Black Men of America
- University of Florida
- University of Miami
- University of South Florida

CONDITIONS STUDIED INCLUDE



Respiratory Diseases



Hepatitis C



Mental Health



Obesity



Pain

PROJECTS FUNDED IN FLORIDA ARE:

RESEARCH PROJECTS

Comparing Oral Medicines to Treat Hepatitis C Virus	University of Florida	\$12 M
A Prospective Comparative Study of Outcomes with Proton and Photon Radiation in Prostate Cancer	University of Florida Board of Trustees	\$12 M
Comparison of Sleep Apnea Assessment Strategies to Maximize Traumatic Brain Injury Rehabilitation Participation and Outcome	Tampa VA Research and Education Foundation	\$2.6 M
Monitoring and Peer Support to Improve Treatment Adherence and Outcomes in Patients with Overlap Chronic Obstructive Pulmonary Disease and Sleep Apnea	COPD Foundation, Inc.	\$2.5 M
Shared Medical Decision Making in Pediatric Diabetes	Nemours Children's Clinic	\$2.1 M
Culturally Sensitive, Primary Care Clinic-Based Interventions to Promote and Sustain Weight Loss among Black Women Patients with Obesity	University of Florida	\$2.1 M
Comparative Effectiveness of Behavioral Interventions to Prevent or Delay Dementia	University of Florida	\$2 M
Patient Outcomes of a Self-Care Management Approach to Cancer Symptoms	University of South Florida	\$2 M
An Emergency Department-to-Home Intervention to Improve Quality of Life and Reduce Hospital Use	University of Florida	\$2 M
Interventions for Prostate Cancer Patients and Their Caregivers	Moffitt Cancer Center	\$1.4 M

ENGAGEMENT IN RESEARCH PROJECTS

Statewide Partnership for Training Florida's Community Health Workers in Patient-Centered Research	University of Miami Miller School of Medicine	\$250,000
Conferences for Engaging Key Stakeholders in Metastatic Cancer Research and Treatment	Metastasis Research Society	\$220,000
Developing a Community Partnership Focused on Prevention of Opiate Exposed Newborns (Tiers I, II, and III)	University of South Florida	\$90,000
Partnership to Support Chronic Pain Sufferers in Managing Comorbid Chronic Conditions: Diabetes and/or Cardiovascular Disease	Empower Outcomes	\$50,000
Treating Depressed Primary Care Patients	University of South Florida	\$50,000
Capacity Building and Community Engagement for Patient-Centered Musculoskeletal Pain Research (Tiers I and II)	Brooks Rehabilitation-University of Florida, College of Public Health and Health Professions Research Collaboration	\$40,000
Building Capacity and Forging Collaborations in Autism Research for Underserved Families (Tiers I and II)	University of Florida Board of Trustees	\$40,000
Fecal Incontinence in Primary Care Consortium (Tiers I and II)	Nova Southeastern University	\$40,000
Engaging Community Stakeholders to Improve Childhood Obesity Interventions (Tiers I and II)	Florida Introduces Physical Activity and Nutrition to Youth	\$40,000

RESEARCH INFRASTRUCTURE PROJECTS

The COPD Patient-Powered Research Network (Phases I and II)	COPD Foundation, Inc.	\$2.8 M
American BRCA Outcomes and Utilization of Testing Patient-Powered Research Network (Phases I and II)	University of South Florida	\$2.5 M
Planning for Congenital Zika Syndrome Surveillance	University of Florida	\$400,000

Highlights of PCORI-Funded Research Results

Since PCORI began funding research in 2012, a growing number of our funded studies have produced important results that are being reported in leading medical journals. Here are examples:

For Many with Type 2 Diabetes, Daily Finger Sticks Offer Little Health Benefit

People with type 2 diabetes who are not using insulin are often advised to check their blood sugar levels using daily finger sticks, which can be painful and inconvenient, as well as run up out-of-pocket costs for test strips. This study suggests that for these patients, daily self-monitoring does not help control diabetes or delay the need to start insulin compared with not doing so.

Over five years,
10 BILLION
finger sticks could
be avoided

Young L et al. [JAMA Intern Med.](#) 2017 Jul 1; 177(7)

Initiative to Reduce Risky Opioid Prescribing Works

This study compared rates of opioid use in clinics in Washington State that implemented an initiative focused on more-cautious prescribing of opioid drugs with clinics that did not use such strategies. This health system-based initiative led to reductions in high-dose opioid prescribing, and patients did not report worse pain control.

Von Korff M et al. [J Pain.](#) 2016 Jan; 17(1)

Engaging Parents in Hospital Rounds to Ensure Patient Safety

Improving communication among patients and staff in the hospital can help reduce harmful medical errors, a leading cause of death. A PCORI-funded research team found that using a program called I-PASS, which includes parents as active participants in clinicians' rounds of pediatric units, reduced preventable adverse events by 38 percent.

Landrigan C et al. [BMJ.](#) 2018 Dec 5; 363:k4764

Bypass Shown to Be Most Effective Weight-Loss Surgery Procedure

This study, the largest to date to compare weight-loss surgeries, analyzed 46,000 patients' outcomes using PCORnet. Adults who had Roux-en-Y gastric bypass, a long used approach, lost more weight and kept it off, and had slightly higher rates of type 2 diabetes remission than those who had the newest procedure, sleeve gastrectomy. Both bypass and sleeve were more effective than adjustable gastric banding. Risks of major adverse events shortly after surgery were small for all three surgeries, but were highest for bypass.

Arterburn D et al. [JAMA Surg.](#) 2020 March 4

Simple Questionnaire Enhances Shared Decision Making about Chest Pain

A questionnaire called Chest Pain Choice can help people who go to the emergency department with chest pain, but who are found to not be having a heart attack, decide whether to be admitted to the hospital for follow-up tests or go home and have the tests later. People who used the aid were much more likely to go home from the emergency department, with no increase in later heart-related problems.

Hess E et al. [BMJ.](#) 2016 Dec 5; 355

Over five years,
9.4 MILLION
Americans could
benefit from using
the decision aid

Oral Antibiotics Work as Well as IV, with Fewer Costly Complications

In preventing a recurrence of infection, children discharged from the hospital after a serious bacterial infection did just as well on oral antibiotics as those sent home with an IV line to deliver antibiotics intravenously. They also had none of the frequent complications IV lines can cause.

Keren R et al. [JAMA Pediatr.](#) 2015 Feb; 169(2)

Shah S et al. [Pediatrics.](#) 2016 Dec; 138(6)

Rangel S et al. [Ann Surg.](#) 2017 Aug; 266(2)

Disadvantaged Patients with Chronic Pain Benefit from Tailored Nondrug Therapies

Chronic pain occurs more frequently in people with lower education and income levels. In this study, both cognitive behavioral therapy and pain educational material, each tailored to match patients' education levels, significantly lessened pain and improved physical function compared with usual care. These nondrug approaches can help manage chronic pain and reduce the need for opioids. These findings show such approaches can be effective in patients with low incomes and limited reading skills.

Thorn B et al. [Ann Intern Med](#). 2018 Apr 3;168(7)

Findings Help Men Choose among Prostate Cancer Treatment Options

Two PCORI-funded studies provided men with up-to-date information about the rates of several major side effects associated with current treatments for prostate cancer. The information applies to robot-assisted surgery and newer forms of radiation therapy, as well as active monitoring instead of immediate treatment. These results will help men with prostate cancer and their families better weigh the benefits and risks of each treatment in consultation with their clinicians.

Barocas D et al. [JAMA](#). 2017 Mar 21; 317(11)

Hoffman K et al. [JAMA](#). 2020 Jan 14; 323 (2) 149-163

For Earaches and Strep Throat in Kids, Narrow-Spectrum Antibiotics Are Better

Narrow-spectrum antibiotics did just as well for clearing up ear infections and sore throats caused by bacteria as more-expensive broad-spectrum antibiotics did. Broad-spectrum drugs caused more side effects, such as vomiting. Unnecessary use of broad-spectrum antibiotics is associated with increasing bacterial drug resistance.

Gerber JS et al. [JAMA](#). 2017 Dec 19;318(23)

Shared Decision Making Helps Decisions Related to Advanced Heart Failure

Surgically implanting a left ventricular assist device (LVAD) can prolong the lives of people with end-stage heart failure. But the surgery and device carry significant risk for harms, such as infections and stroke. Using a shared decision making tool improved patients' knowledge about the potential benefits and risks of an LVAD compared with typical educational pamphlets. The aid also helped them make initial decisions better aligned with their values.

Allen LA et al. [JAMA Intern Med](#). 2018 Apr 1; 178(4)

Blood Thinner Keeps Stroke Survivors in Their Homes

Using the blood thinner warfarin helped stroke survivors reduce future hospitalizations and stay in their homes—on average 46 more days at home over two years — compared with those who didn't take the drug after being discharged from the hospital. The

drug also lowered the rates of stroke recurrence and heart attack, but staying at home rather than having to go to a nursing home or hospital was the outcome that mattered most to patients.

Xian Y et al. [BMJ](#). 2015; 351

O'Brien EC et al. [Circulation](#). 2015 Oct 13; 132 (15)

Behavioral Health Homes Improve Outcomes for People with Mental Illness

Behavioral health homes, a patient-centered way of coordinating care for patients with both mental and physical health needs, can help people with serious mental illnesses manage their conditions and possibly live longer, healthier lives. Two ways of providing a behavioral health home—a patient self-directed approach and a healthcare provider-supported approach—both significantly increased patients' knowledge and confidence to manage their own care and increased their engagement in care, but the provider-supported approach did so faster.

Schuster J et al. [Health Aff](#). 2018 Feb; 37(2)

Linking People with Community Resources to Reduce Childhood Obesity

Compared with usual obesity care, two enhanced approaches to weight-loss management helped modestly improve body mass index (BMI) in overweight or obese children and improve other key health measures and family satisfaction with care. Both approaches provided supportive text messages and linked families to community resources. The further addition of bimonthly coaching on healthy behaviors achieved slightly but not significantly greater reductions in children's BMI.

Taveras EM et al. [JAMA Pediatr](#). 2017 Aug 7; 171(8)

Over five years
in the United States,

466
strokes could
be avoided

For additional highlights of PCORI-funded research results, visit our website at www.pcori.org/results.

And to explore all results from PCORI-funded studies to date, visit www.pcori.org/completed-projects.

ER-CML-2480 Lending to Not-For-Profit Hospitals Credit Policy

Distribution All SunTrust Lending Teammates	Version 12		Effective Date 07/01/2010
Issued By Enterprise Risk – Wholesale Policy & Programs	Type Policy	Level II	Last Review 03/26/2019
Approvals Enterprise Credit Risk Executive or Designee			Next Review 03/28/2020

Printed copies are for reference only. Please refer to the electronic copy for the latest version.

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1. Scope

This policy provides direction in evaluating credit risk and extending credit to Not-for-Profit (NFP) Hospitals.

This policy applies to NFP single hospitals or hospital systems. The extension of credit to FP hospitals is governed by policies applicable to publicly-traded or privately-owned commercial enterprises.

ER-CML-2480g Lending to Not-For-Profit Hospitals Guidelines are to be read in conjunction with this policy and provide guidance on underwriting and due diligence.

2. Roles and Responsibilities

The table below highlights the SunTrust Segments, Functions and Teammates having specific roles and responsibilities related to this policy.

Responsible Party	Summary of Roles and Responsibilities
SunTrust and STI Institutional & Government, Inc. Lending Teammates	Are responsible for understanding and executing all lending activities in compliance with the spirit and intent of this policy.

3. Policy Elements

3.1. Overview of NFP and FP Hospitals

The Bank divides hospitals in the U.S. into two (2) categories:

- Not-for-profit (NFP); and
- For-profit (FP) also known as investor-owned.

NFP hospitals are tax-exempt community-based organizations that serve the needs of the people in the communities where they are located. Larger hospital systems also draw patients from tertiary markets due to specialties and/or affiliations with other hospitals. Included in the NFP group are various government-affiliated hospitals. A local board generally governs NFP hospitals although there are organizations with multi-NFP locations, which might entail several governance layers. They operate with a charitable mission-based purpose by typically providing services to all members of a community and investing their excess funds in furthering their mission.

FP hospitals are public companies governed by the parent company's board of directors or private companies owned by one or more investors. At FP hospitals, major decisions may be made by individuals outside the community where the hospital is located. FP hospitals also serve their shareholders or owners of the company; so, decisions are based on the needs of this constituency and may not be based solely on the local hospital's needs.

Not-for-profit entities are not subject to policies [ER-CML-2200 Leveraged Financing Transactions Policy](#) and [ER-CML-2201 Higher-Risk Borrower \(HRB\) Policy](#).

3.2. Coverage Responsibility

Coverage responsibility for NFP hospitals is assigned to the Commercial Banking line of business (CML).

3.3. Target Hospitals

As clients, the Bank generally targets NFP hospitals that have a current agency rating of at least Baa/BBB, or if not rated, hospitals that have an investment profile similar to that of NFP hospitals rated Baa/BBB or better. See the Not-for-Profit Hospital Target Underwriting Guidelines (TUGs) on the [Commercial Not-for-Profit and Government website](#) for further information.

To aid in the selection and underwriting of creditworthy NFP hospitals, rating agency peer ratio and credit trend information and hospital quality of care information may be used.

- [Hospital Compare](#) - search engine to find and compare quality of care measures for hospitals

Also, the [Commercial and Business Banking](#) and [Enterprise Risk](#) websites provide an array of industry information from a variety of resources including eMentor, IBIS WORLD and First Research, to name a few.

3.4. Desirable Transactions

Desirable types of hospital credit transactions include:

- Fixed asset improvement of hospital facility including construction financing of an entire hospital, or for the renovation and/or addition to an existing facility;
- Fixed asset improvement of non-hospital facility if 100% guaranteed by hospital including lending for construction of a medical office building, ambulatory surgery center, skilled nursing facility, assisted living facility or continuing care retirement center, etc. Or for the renovation and/or addition to an existing facility;
- Asset acquisition such as land, another hospital or non-hospital facility;
- Debt refinancing, usually done to lower interest costs or to restructure a more desirable repayment plan;
- Working capital loans or to bridge to long-term financing;
- Mergers and acquisitions, typically through the refinancing of outstanding debt;
- Equipment loans;
- Equipment leases; and
- Synthetic leases.

3.5. Required Information

In addition to the normal and customary information requested from the borrowing, guaranteeing, and/or parent entities, the following information is specifically required:

- Three (3) years of audited financial statements with appropriate interim statements; actual results compared to budget, if available;
- Most recent capital and operating budget; and
- Financial projections, if available.

Refer to ER-CML-2100 Financial Statement Requirements (Commercial) Credit Policy for more information.

4. References

- ER-CML-2100 Financial Statement Requirements (Commercial) Credit Policy

5. Associated Procedures and Guidelines

- ER-CML-2480g Lending to Not-For-Profit Hospitals Guidelines

6. Point(s) of Contact

For questions about this policy, contact the Enterprise Credit Risk Executive or his designee.

For questions about the policy management process, contact Enterprise Risk Governance.

7. Glossary

None

8. Appendix

None

9. Change Log from Last Version

Version	Section	Change	Change Date
7	3.3. Target Hospitals	Removed reference and link to Information Center which is no longer active. Removed reference to CIB Healthcare Credit Risk Manager – NFP. Hospitals are managed solely by the Commercial line of business.	07/11/2016
8	1-8	Replaced outdated references with current ER2020 nomenclature throughout. No material changes.	09/15/2016
9	3.3. Target Hospitals	Non-material changes. Changed link from Corporate Risk Management web site (which it was called back in September) to Enterprise Risk.	03/07/2017
10	1-8	Annual review completed.	03/23/2017
10	3.1. Overview of NFP and FP Hospitals	Added that larger hospital systems also draw patients from tertiary markets due to specialties and/or affiliations with other hospitals.	03/23/2017
10	3.3. Target Hospitals	Added reference to Not-for-Profit Hospital Target Underwriting Guidelines (TUGs).	03/23/2017
10	3.4. Desirable Transactions	Removed non-hospital related transactions not relevant to this policy.	03/23/2017
11	1-8	Annual review completed.	03/16/2018
11	3.5. Required Information	Clarified that financial information is requested for the borrowing, guaranteeing and/or parent entity(ies).	03/16/2018
12	Entire Policy	Annual review with no material changes.	03/26/2019



Research Funding

The Patient-Centered Outcomes Research Institute (PCORI) is a nonprofit organization authorized by Congress to fund comparative clinical effectiveness research, or CER. The studies we fund are designed to produce reliable, useful information that will help patients, family caregivers, clinicians, employers, insurers, policy makers and others make better-informed health and healthcare decisions. Our work is guided by a 21-member Board of Governors representing the entire healthcare community.

CER AND PCOR

CER is research that compares two or more available healthcare options to determine what works best for which patients, under what circumstances. PCORI supports patient-centered outcomes research, or PCOR, which is CER that focuses not only on traditional clinical outcomes but also on the needs, preferences, and outcomes most important to patients and those who care for them.

MORE THAN
\$2.6B
AWARDED

MORE THAN
770
RESEARCH AND
RESEARCH-RELATED
PROJECTS

KEY FEATURES OF OUR FUNDED RESEARCH

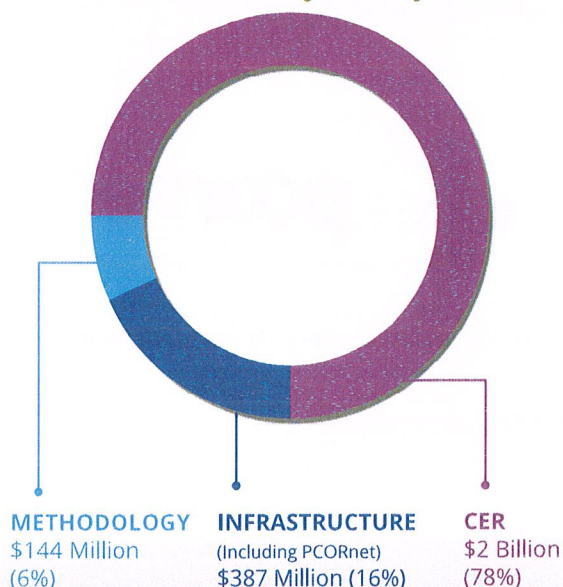
- Compares at least two alternative healthcare options
- Focuses on outcomes that are meaningful to patients
- Engages patients and other stakeholders at every stage
- Studies benefits and harms of care delivered in real-world settings
- Adheres to PCORI's Methodology Standards
- Is likely to improve current clinical practice

WE PAY PARTICULAR ATTENTION TO:

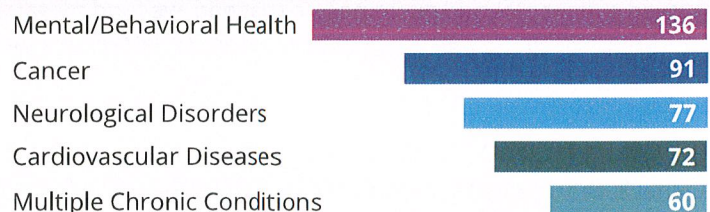
- Conditions that heavily burden patients, families, and/or the healthcare system
- Chronic or multiple conditions
- Rare and understudied conditions
- Conditions with varied outcomes across subpopulations

BY THE NUMBERS

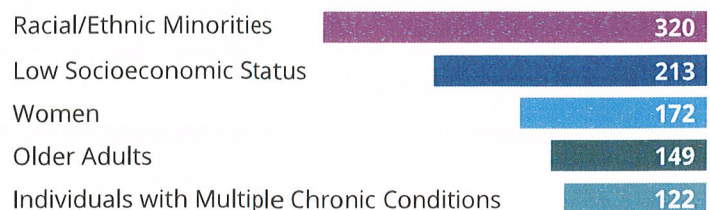
Research Projects By Area



Most Studied Conditions*



Most Studied Populations of Interest*



*Number of projects (out of a total of 493). A project may study more than one condition or population of interest.

ENGAGEMENT

We believe research that involves patients and other stakeholders from the start will lead to useful results more likely to be taken up in practice. So we engage patients and other stakeholders in all aspects of our work and require the research projects we fund to do so as well.

RESEARCH PRIORITIES

Our research funding is guided by five National Priorities for Research, which we developed with significant input from across the healthcare community. These are:

- Assessment of Prevention, Diagnosis, and Treatment Options
- Improving Healthcare Systems
- Addressing Disparities
- Communication and Dissemination Research
- Accelerating Patient-Centered Outcomes Research and Methodological Research

INPUT FROM PATIENTS AND OTHER STAKEHOLDERS

Our funding decisions are guided by input from all sectors of the healthcare community.

- We solicit potential research topics and questions from the community.
- We prioritize topics that meet critical needs through our multi-stakeholder PCORI Advisory Panels.
- We engage patients and other stakeholders in reviewing applications for our funding.

We issue calls for research proposals through PCORI Funding Announcements, which can be found on our website at www.pcori.org/funding-opportunities. Types of announcements:

- Calls for CER studies related to our five National Priorities for Research
- Calls for proposals on specific topics prioritized by stakeholder input
- Calls for proposals for pragmatic clinical studies addressing specific prioritized topics

METHODS MATTER

Better methods will produce more valid, useful information that will lead to better healthcare decisions and, ultimately, to improved patient care and outcomes. To that end, we fund research on ways to improve the conduct of PCOR. And per our authorizing legislation, we've developed a set of Methodology Standards as the basis for sound PCOR.

BUILDING CAPACITY FOR MORE EFFICIENT RESEARCH

PCORnet®, the National Patient-Centered Clinical Research Network, enables patient-centered clinical research to be conducted faster, more easily, and more efficiently. It does so by tapping into rich stores of real-world data collected during routine care through electronic health records, patient-reported outcomes, health claims, and other sources.



By leveraging this information, PCORnet generates evidence about the comparative clinical effectiveness of therapies, diagnostics, and prevention strategies.

PCORnet was developed with funding from the Patient-Centered Outcomes Research Institute.

Competition to Select New HHMI Investigators

Application Due Date: March 18, 2020

The Howard Hughes Medical Institute (HHMI) is seeking creative and innovative scientists to join its Investigator Program. Through this competition, HHMI will expand our community of basic researchers and physician scientists across the nation who catalyze discovery research in basic and biomedical sciences, plant biology, evolutionary biology, biophysics, chemical biology, biomedical engineering, and computational biology. Approximately 20 new Investigators will be selected in this competition. The competition is open to all eligible applicants (see below); no nomination or institutional endorsement is required or accepted.

HHMI believes in the power of individuals to make breakthroughs over time. In keeping with this philosophy, we provide our Investigators with generous and flexible support, including salary, benefits, and a research budget, and allow them to pursue their scientific interests and change research focus during a seven-year renewable appointment. HHMI Investigators maintain their academic appointments and labs at their home institutions, allowing them to engage with their scientific colleagues and be active in training and service. Investigators attend one of several annual scientific meetings that highlight science within the Institute. These meetings foster interaction and collaboration among a community of nearly 300 HHMI Investigators and other HHMI-funded scientists spanning a range of career stages. Investigators also have opportunities to work with HHMI's scientific leadership to promote our mission.

At HHMI, we believe that creating new knowledge and solving difficult scientific problems requires the perspectives of people with different backgrounds and experiences. Scientists with unique perspectives ask different questions, which can lead to new insights that drive science forward. HHMI seeks a broad applicant pool and welcomes applications from individuals with diverse backgrounds and perspectives, including those from gender, racial, ethnic, and other groups underrepresented in the biological sciences.

For additional information regarding the HHMI Investigator Program and this competition visit: hhmi.org/programs/biomedical-research/investigator-program.

Eligibility

The Investigator Program is open to individuals who:

- hold a PhD and/or MD (or the equivalent).
- have a tenured or tenure-track position as an assistant professor or higher academic rank (or the equivalent) at an eligible US institution. Federal government employees are not eligible.
- have more than five but no more than 15 years of post-training, professional experience. To meet this requirement, the applicant's first professional appointment must have begun no earlier than March 1, 2005, and no later than April 1, 2015.
- are the principal investigator on one or more active, national, peer-reviewed research grants with an initial duration of at least three years as of April 1, 2020. Mentored awards and training grants do not qualify. Multi-investigator grants may qualify.

Important Conditions

Some important conditions of the HHMI Investigator appointment:

- Although they retain academic appointments at their respective institutions, Investigators must become full-time employees of HHMI, which provides full salary and benefits. Investigators are appointed for a seven-year, renewable period.
- Investigators are required to devote at least 75% of their professional activities to the direct conduct of research. Applicants with administrative responsibilities or other duties inconsistent with this time commitment may apply but must reduce those other commitments prior to their appointment.
- Investigator appointments will be made at the institution where the applicant held a qualifying position on March 18, 2020. Alternatively, appointments may be made at a different institution, provided the applicant notifies HHMI of the institution change no later than October 9, 2020. Additional details can be found in the competition [Frequently Asked Questions \(FAQ\)](#) document.

- An Investigator may not retain an HHMI appointment if the Investigator transfers to another institution prior to the initial appointment review. An early review can be requested after five years.

Please submit questions regarding eligibility or HHMI policies to sciencecomp@hhmi.org.

Application Process

Applicants may establish eligibility and apply via the HHMI Application and Review Channel website at arc.hhmi.org beginning October 22, 2019.

Applications must be submitted on the website by March 18, 2020, at 3:00 p.m. (EDT).

The application includes the following components:

- A summary of the applicant's major research contributions.
- An abstract providing an overview of the biological questions and goals of the applicant's research program.
- A description of the applicant's ongoing and planned research program.
- Five selected articles that highlight the applicant's most important scientific contributions with a focus on the most recent five years, as well as paragraphs describing the significance and impact of each contribution.
- Additional applicant information such as a bibliography, list of current research support, education, and training.

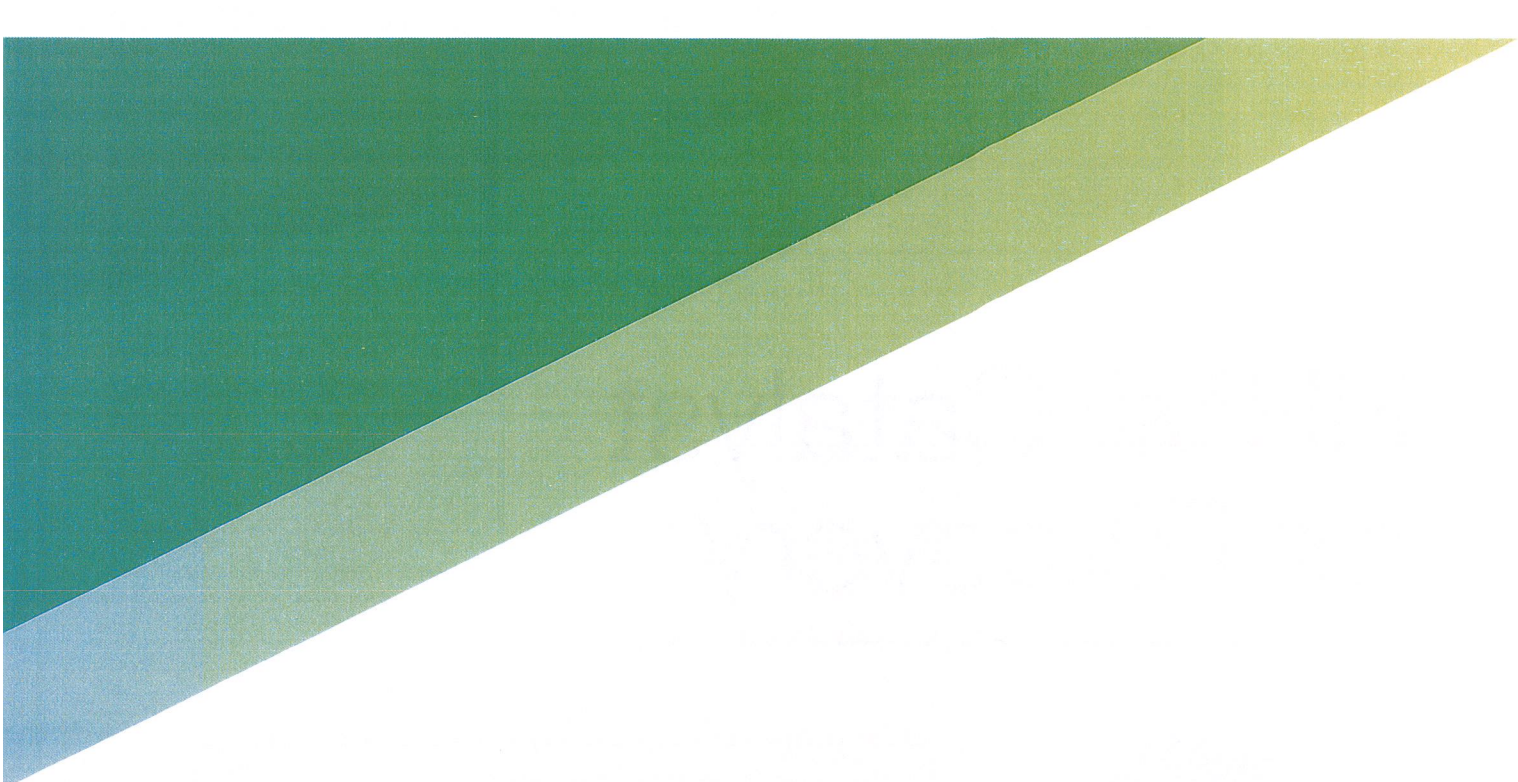
Letters of recommendation will not be required or accepted for this competition.

Selection of Investigators

HHMI will assess the research achievements and prospects for future contributions of the applicant's independent research program. Applications will be evaluated by distinguished scientists. Semifinalists will be selected by December 9, 2020, and will be invited

to a symposium at HHMI's Janelia Research Campus in Ashburn, Virginia, where they will make a brief research presentation to HHMI scientific leadership and the final advisory panel. All applicants should mark the March 21-22, 2021, dates on their calendars. Those named as semifinalists will be required to attend and should plan to arrive on March 21st. The selection of finalists will be made by the end of April 2021, with HHMI Investigator appointments starting as early as September 1, 2021.

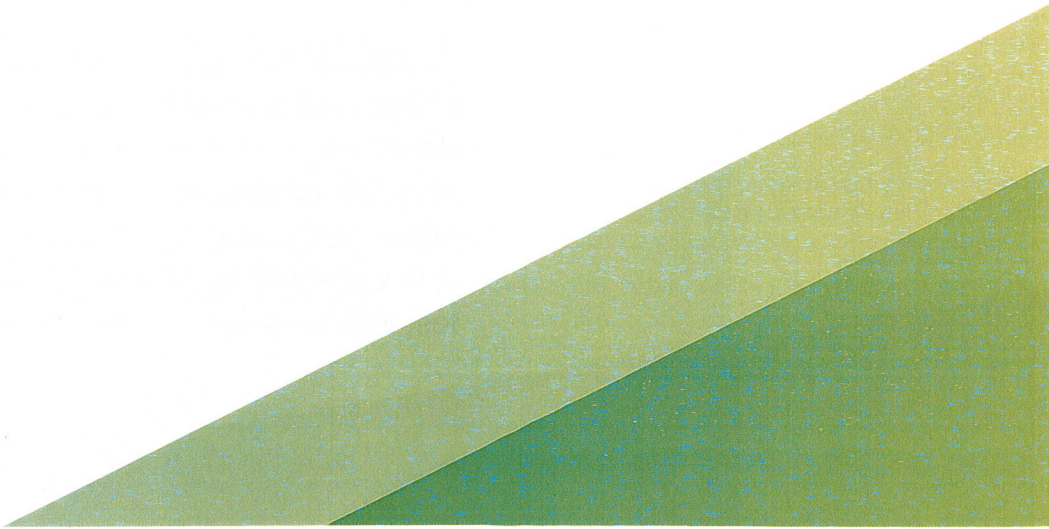
The Howard Hughes Medical Institute is an equal opportunity employer.



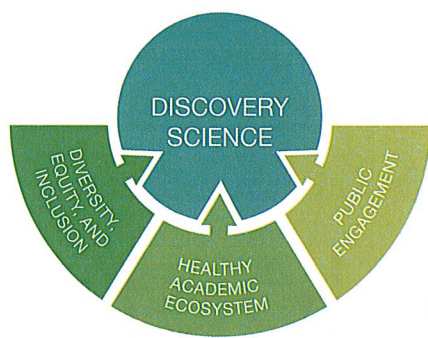
HHMI: Catalyst for Discovery

November 2017

hhmi | Howard Hughes
Medical Institute



HHMI: Catalyst for Discovery



For 60 years, HHMI has been moving science forward. We're an independent, ever-evolving philanthropy that supports basic biomedical scientists and educators with the potential for transformative impact. We make long-term investments in people, not just projects, because we believe in the power of individuals to make breakthroughs over time. HHMI scientists have radically advanced the understanding of cells, the brain, the immune system, the development of organs, and how to treat many diseases.

Our HHMI community cultivates an ethos of excellence. We think in generations—and we want the next generation of science to be more vibrant and inclusive than today. We see potential for significant changes in academic culture, from science education to the research environment. We're committed to experimenting with new approaches to achieve progress and sharing what we learn along the way.

To ensure that we use HHMI's resources for maximum impact, we've established core priorities to guide our decisions over the next five to ten years. During this time, we will focus on: reaffirming our commitment to discovery science; increasing diversity and inclusion in the scientific workforce; engaging the public; and fostering a healthy academic ecosystem.

Significant new knowledge cannot be supplied on demand—it unfolds over time, through exploration, experimentation, and rigorous debate.

REAFFIRMING OUR COMMITMENT TO DISCOVERY SCIENCE

Significant new knowledge cannot be supplied on demand—it unfolds over time, through exploration, experimentation, and rigorous debate. HHMI catalyzes discovery in basic biomedical research, generating knowledge about the structure and function of living systems at the level of molecules, cells, behaviors, and interactions, with potential to benefit humanity. We place big bets on curious and ambitious researchers, supporting them with generous and flexible funding for significant periods of time, subject to rigorous periodic scientific review. As one measure of success, to date, 28 current or former HHMI scientists have been awarded a Nobel Prize. We take our responsibility as a major supporter of discovery science seriously and look to make maximum impact, particularly at a time in which many funders are shifting toward more applied research.

Goal: HHMI will ensure that our investigators are fully able to explore new scientific territory, taking the intellectual and career risks necessary to advance our basic understanding of biology.

- **Rationale:** The HHMI Investigator program is HHMI's longest-running effort to sustain innovation in science. With our support, investigators build a research team and environment well suited to tackle profound science questions, with the assurance that they have adequate time, funding, equipment, peer community, mentoring, and lab and support staff.
- **Approach:** We will continuously work to evaluate the HHMI Investigator program and adjust the resources we offer investigators, including factors such as the terms of eligibility to become an investigator, the length of an investigator's term, the level and nature of support provided to investigators, and the frequency and nature of investigator competitions.

Goal: HHMI will continually catalyze new research fields at our Janelia Research Campus, through tool development, discovery science, and training.

- **Rationale:** HHMI scientists at Janelia have transformed how researchers worldwide study and understand the brain by developing and applying critical new tools, including microscopes, fluorescent sensors, and imaging dyes. Looking ahead, we believe that Janelia can break open other high-impact, challenging research areas with similarly collaborative efforts. To achieve this scientific impact, we plan to periodically change research focus as current areas mature and to actively recruit the next generation of independent scientists to help develop new areas.
- **Approach:** We are now operating on 15-year research cycles at Janelia. We will develop a given research area for roughly 15 years to gain traction and attract outside interest, at which point we'll cycle to a new area of focus. This approach enables Janelia to stay at the frontier of science, advancing 1-3 research areas at any point in time. HHMI will hold open competitions to determine Janelia's future research areas. In addition, we will emphasize recruitment of highly creative scientists who are ready to pursue an independent research career soon after graduate school.

Goal: HHMI will actively develop strategic partnerships with philanthropies and donors to invest in promising scientists and discovery science.

- ▶ **Rationale:** There are many more deserving scientists than HHMI can fund through our programs. By partnering with other philanthropies, we can extend our successful programs and share our knowledge with individuals and organizations interested in supporting discovery science.
- ▶ **Approach:** HHMI's rigorous and multi-phased review process relies on an administrative infrastructure and expert reviewer network that are difficult for small or new foundations to build. We will offer select philanthropies and donors the opportunity to join us in funding select scientists or projects. We will also seek appropriate opportunities to share HHMI's funding philosophy and approach with others.

We need the varying perspectives of people who come from different races, ethnicities, genders, training backgrounds, and more.

INCREASING DIVERSITY, EQUITY, AND INCLUSION IN THE SCIENTIFIC WORKFORCE

HHMI's research labs, like many others, do not reflect the demographic diversity of the U.S. population. As a result, we miss talent that we otherwise might have in science. That's a problem—not only socially, but also scientifically. We want to find the best solutions to difficult problems. To do that, we need the varying perspectives of people who come from different races, ethnicities, genders, training backgrounds, and more.

Goal: HHMI will actively use our resources—funding, community, and influence—to increase diversity, equity, and inclusion in our scientific community and beyond.

- ▶ **Rationale:** At large U.S. research universities, only a quarter of full professors in the life sciences are women. The number of underrepresented minorities is vanishingly small. Because HHMI trains many scientists in top academic labs, we have a unique opportunity to address this important problem by actively identifying and nurturing talent from all backgrounds.
- ▶ **Approach:** We work to foster the scientific careers of highly talented researchers from underrepresented groups in science. Through our Gilliam Fellows program, we hold open competitions to select and support underrepresented PhD students. Similarly, our Hanna H. Gray Fellows program selects postdoctoral fellows, who are funded all the way into the first few years of an independent academic appointment. In addition to these program efforts, HHMI is placing new emphasis on developing inclusive environments in our own labs and operations.

Goal: HHMI will partner with universities and colleges to build their capacity to develop scientific talent in ALL students and to overcome barriers such as socioeconomic status, gender, or ethnic and racial background.

The sustained excellence of our nation's science, and its proper role in society, depends upon a public that understands the importance of science.

- **Rationale:** Every year in the U.S., about 40% of freshmen (more than 1.5 million students) enter college planning to study science, technology, engineering, or math (STEM). Before the end of their sophomore year, many switch to non-STEM majors. This attrition is greatest among underrepresented groups, where up to 80% leave STEM. Why does this happen—and what can schools do about it?
- **Approach:** We support the development and sharing of innovative approaches that colleges and universities can take to enable students from all backgrounds to experience science and to pursue further study of science. Our Inclusive Excellence initiative challenges schools to make foundational and lasting changes, from improving the structure of science coursework and teaching to adjusting school policies, better training faculty, and improving campus culture so that all students have positive exposure to science. We are working to identify the key ingredients of the most successfully inclusive school environments, so that other schools can adopt what works. For example, we seek to replicate the success of programs such as the Meyerhoff Scholars program at the University of Maryland, Baltimore County.

ENGAGING THE PUBLIC

The sustained excellence of our nation's science, and its proper role in society, depends upon a public that understands the importance of science—its process, as well as its payoffs. To value science, the public needs good and compelling information. HHMI has established a leading position in public engagement as an organization with both a deep understanding of biological science and education and professional media production capabilities. HHMI has the potential for significant positive impact on a national scale. Two elements essential to making that impact are powerful partners and powerful content.

Goal: HHMI will enable established journalism organizations to provide greater and deeper coverage of science and medicine.

- **Rationale:** Today's news organizations lack resources for in-depth reporting and storytelling, which has led to decreases in both the amount and depth of science coverage across the country. The current rise in anti-scientific attitudes makes this a particularly important time to bring science to broad audiences.
- **Approach:** We will work with organizations such as the Associated Press, the largest provider of news content in the world, to promote greater and deeper coverage of important scientific topics. We will increase awareness and knowledge about contemporary science among people of different ages and backgrounds.

Goal: HHMI will create powerful science content that inspires and engages a broad spectrum of audiences.

- **Rationale:** Good information is necessary yet insufficient to convey the role of scientists in shaping our world. To fully value science, the public also needs to be inspired. That inspiration often comes from a glimpse into the hearts and lives of scientists—their passions, aspirations, struggles, setbacks, and the price many pay for the reward of discovery.

We believe HHMI has an opportunity to collaborate with other scientific leaders to address these issues in concrete ways.

- **Approach:** To bring powerful stories about the lives and work of scientists to the public, HHMI Tangled Bank Studios will continue to seek out and collaborate with exceptional filmmakers who work in the most immersive formats. These films will be the cornerstones of larger media projects that employ a combination of strategies and partners to increase our reach and to inspire greater appreciation for and interest in science among diverse audiences.

PROMOTING A HEALTHY ACADEMIC ECOSYSTEM

Federal and state funding for higher education has tightened considerably in recent years, creating a hyper-competitive academic research environment. Researchers confront pressure to constantly pursue multiple grant opportunities, demonstrate research impact by publishing in a handful of highly selective journals, and protect their data, rather than share information for the betterment of science. At the same time, they are not rewarded for taking time to teach, mentor, and serve the scientific community. These trends contribute to a systemically unhealthy academic environment, impeding the exploratory nature of discovery science and threatening the quality of U.S. biomedical research. We believe HHMI has an opportunity to collaborate with other scientific leaders to address these issues in concrete ways.

Goal: HHMI will promote and model a scientific publishing system that puts the interest of science above the interest of publishers, through open dissemination and transparent evaluation of scientific work.

- **Rationale:** If we value scientists who share their research results openly and rapidly, we need to devise better incentives to promote a culture of open science. Currently, academic incentives are pegged to a publishing system that was designed in a pre-digital world, with journals as gatekeepers of quality control and publishing. As a result, scientific publishing serves the interests of publishers over those of the scientific community. Many academic institutions effectively buy into this model by making decisions about their faculty based largely on journal metrics and quantity of output.
- **Approach:** In partnership with other funders and scientific organizations, we will consider and support new publishing models, such as author-driven dissemination and a transparent evaluation process that treats peer reviews as scholarly work. We will also leverage HHMI's support for, and lessons from, the journal *eLife*, which has already established a transparent and consultative peer review process.

Goal: HHMI will promote consideration of models for faculty evaluation that emphasize the long-term impact of their research and include an evaluation of teaching, mentoring, and service.

- **Rationale:** If we value scientists who execute original, creative, and bold research programs, while contributing to the greater scientific community, we need to evaluate them based on these characteristics. HHMI applies these standards to evaluation of our HHMI investigators. While the exact methods that work for HHMI will not work everywhere, we believe that scientific leaders can together pioneer effective principles of evaluation—ultimately changing science for the better.
- **Approach:** In partnership with leaders of academic institutions and funders, we will explore how to better evaluate research performance, teaching, mentoring, and service. We plan to do this by convening leaders, sharing our experience, and continuing to refine our own methods of evaluation.

CONCLUSION

There is no more important time to invest in discovery science. Scientists are capturing an increasingly sophisticated molecular view of the behavior of cells and organisms. Studies of human cells, genes, and genomes also can illuminate many of the underpinnings of human health and disease that previously could only be inferred from the study of model organisms. In a variety of biomedical fields, HHMI scientists continue to challenge our very understanding of how life works. The new knowledge they create has great potential to benefit humanity.

But it's not enough to simply do and support science. If we want the resulting discoveries to be effectively translated into benefits for society, we also need to address the challenges and opportunities that today's research environment presents. As a recognized leader in research and education, HHMI has unique opportunity to respond meaningfully to these challenges—in the scientific community, in classrooms, and in the public arena. We are committed to driving science forward.

www.hhmi.org

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Medical Institute