

**NATIONAL INSTITUTES OF HEALTH**

**NATIONAL INSTITUTE ON AGING**

**Summary Minutes**

**The 141st Meeting**

**NATIONAL ADVISORY COUNCIL ON AGING**

**September 8–9, 2020**

**National Institutes of Health  
Virtual Meeting  
Bethesda, MD 20892**

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Department of Health and Human Services  
Public Health Service  
National Institutes of Health  
National Institute on Aging

**NATIONAL ADVISORY COUNCIL ON AGING  
SUMMARY MINUTES  
September 8-9, 2020**

The 141st meeting of the National Advisory Council on Aging (NACA) was convened on Tuesday, September 8, 2020, online via Zoom. Dr. Richard Hodes, Director, National Institute on Aging (NIA), presided.

In accordance with the provisions of Public Law 92–463, the meeting was closed to the public on Tuesday, September 8, from 3 p.m. to 5 p.m. for the review, discussion, and evaluation of grant applications in accordance with the provisions set forth in Sections 552(b)(c)(4) and 552(b)(c)(6), Title 5, U.S. Code and Section 10(d) of the Public Law 92–463.<sup>1</sup> The meeting was open to the public on Wednesday, September 9, 2020, from 10:00 a.m. to 1:15 p.m.

**Council Participants:**

Dr. David A. Bennett  
Dr. Shalender Bhasin  
Ms. Meryl Comer  
Dr. Monica A. Driscoll  
Dr. Terry T. Fulmer  
Dr. Alison M. Goate  
Dr. Margaret A. Goodell  
Dr. J Taylor Harden  
Dr. David M. Holtzman  
Dr. Stephen B. Kritchevsky  
Dr. Jennifer Manly  
Ms. Susan K. Peschin  
Dr. Eric Michael Reiman  
Dr. Clifford James Rosen  
Dr. Amy Jo Wagers  
Dr. David Weir  
Dr. Keith E. Whitfield

**Ex Officio Participants:**

Dr. Sarah Ruiz, Administration for Community Living

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<sup>1</sup> For the record, it is noted that members absented themselves from the meeting when the Council discussed applications (a) from their respective institutions or (b) in which a conflict of interest may have occurred. This procedure only applied to applications that were discussed individually, not to “en bloc” actions.

The Council Roster, which gives titles, affiliations, and terms of appointment, is appended to these minutes as attachment A.

**In Addition to NIA Staff, Other Federal Employees Present:**

Dr. Eliseo J. Pérez-Stable, Director, National Institute on Minority Health and Health Disparities

**Members of the Public Present:**

Dr. Rose Maria Li, Rose Li and Associates, Inc.

Dr. Frances McFarland, Rose Li and Associates, Inc.

**I. REVIEW OF APPLICATIONS**

This portion of the meeting was closed to the public, in accordance with the determination that it concerned matters exempt from mandatory disclosure under Sections 552(b)(c)(4) and 552(b)(c)(6), Title 5, U.S. Code and Section 10(d) of the Federal Advisory Committee Act, as amended (5 U.S.C. Appendix).<sup>2</sup>

A total of 2,327 applications requesting \$4,438,494,276 for all years underwent initial review. The Council recommended 1,240 awards for a total of \$1,874,455,604 for all years. The actual funding of the awards recommended is determined by the availability of funds, percentile ranks, priority scores, and program relevance.

**II. CALL TO ORDER**

Dr. Hodes welcomed members to the open session of the 141st NACA meeting and called the meeting to order at 10:05 a.m. on Wednesday, September 9, 2020.

**A. Director's Status Report**

Dr. Hodes reported that the Senate has not yet released a draft bill for the FY21 budget. A draft bill from the House calls for a \$5.5 billion increase from FY20, \$5 billion of which has been designated for COVID-related emergency activities. The bill includes an NIA budget of \$3.609 billion, representing a 0.86% increase from FY20, along with an additional \$35 million for research on Alzheimer's disease (AD) and related dementias (ADRD) and \$228 million for COVID-related emergency funding. The President's budget for FY21 calls for a decrease in funding for NIH, including AD/ADRD research. It is unlikely that a new budget will be passed by the end of the fiscal year. Thus, the federal government will likely operate under a continuing resolution, which will maintain FY20 funding levels.

Dr. Hodes also noted that NIH has submitted the AD bypass budget for FY22. This budget projects more than \$434 million in total costs for new AD/ADRD research, which accounts for available funding from prior approvals, the President's proposed budget, and an estimated \$289 million in additional resources. Dr. Hodes reminded Council that the bypass budget includes a

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progress report highlighting recent scientific advances across multiple research topics, and he also noted processes in place for tracking awards and research milestones.

In response to the COVID-19 pandemic, NIH has generated Notices of Special Interest (NOSIs) to expedite application reviews and funds distribution for COVID-19 research. NIA has issued a NOSI that highlights the urgent need for research on COVID-19 and supports mission-critical areas of research, and it has published a Funding Opportunity Announcement (FOA) supporting implementation grants for a multisite clinical trial on aging-related topics in at-risk older adults.

Dr. Hodes reported that NIH has named Joshua Denny, M.D., M.S., as Chief Executive Officer of the *All of Us* Research Program. He also announced the appointments of John Ngai, Ph.D., as Director of the BRAIN Initiative and Rick Woychik, Ph.D., M.S., as Director of the National Institute of Environmental Health Sciences. In addition, NIA Deputy Director Marie Bernard, M.D., will serve as Acting Chief Officer for Scientific Workforce Diversity following the retirement of Dr. Hannah Valantine on September 30. Dr. Hodes also announced several staff updates, including the promotion of Lisbeth Nielsen, Ph.D. to Director, Division of Behavioral and Social Research, and the appointment of Patricia Jones, D.P.H., M.P.H., M.S., as Director, Office of Special Populations. He noted that even in the midst of the COVID-19 crisis, NIH and NIA continue to recruit talented staff.

Dr. Hodes further reported that NIA has published 7 press releases, 44 research highlights, and 10 news announcements since January 2020. In addition, NIA leadership has participated in 10 congressional briefings and 14 stakeholder/advocacy group meetings. NIA also has released the *NIA Strategic Directions for Research, 2020-2025*. The 2021 AD Research Summit has been scheduled for April 19–20, 2021, and will be a virtual meeting.

## **B. Future Meeting Dates**

January 12-13, 2021 (Tuesday and Wednesday, virtual)  
May 11-12, 2021 (Tuesday and Wednesday, Building 31)  
September 14-15, 2021 (Tuesday and Wednesday, Building 45)  
January 25-26, 2022 (Tuesday and Wednesday, Building 45)  
May 5-6, 2022 (Thursday and Friday, Building 45)  
September 7-8, 2022 (Wednesday and Thursday, Building 45)

## **C. Consideration of Minutes of the Last Meeting**

The minutes of the May 2020 Council meeting were considered. A motion was made, seconded, and passed unanimously to approve the minutes.

## **III. REPORT: TASK FORCE ON MINORITY AGING RESEARCH**

Dr. David Bennett, Task Force Co-Chair, reported that the Task Force heard two presentations during the previous day's meeting. In the first, Dr. Bernard provided an update on implementation of NIH's policy on inclusion across the lifespan. First implemented in 1986, this policy was revised in 2016 as part of the 21st Century Cures Act and in response to findings that clinical trials often excluded individuals based on age, either directly through arbitrary age caps or indirectly through exclusion criteria such as comorbidities and polypharmacy. To meet the

goals of the revised inclusion policy, NIH has developed evidence-based strategies to maximize diversity and representativeness in studies involving older adults. Such strategies include development and implementation of a plan for an intentionally inclusive study population; training in aging research, flexible study protocols, and patient-centered outcomes; and pragmatic clinical trials and real-world evidence.

In the second presentation, Dr. Patricia Jones, Director of the Office of Special Populations, shared the Office's vision and tangible strategies to promote career advancement and enhance diversity in the scientific workforce. Dr. Jones also provided an update on the Butler-Williams Scholars Program, including its record number of applications this year. Fifty-five participants were selected, of whom 40% were from traditionally underrepresented groups. Because of COVID-19, this year's program was implemented remotely and was held over 2.5 days instead of the traditional 5 days. In a post-program survey, respondents gave the program high marks in several areas. Suggestions for improvement included accommodating the needs of adult learners, maintaining the cohort size at 55 but offering more cycles per year, and building a longer-term sense of community among scholars and staff.

Dr. Bennett noted that this would be the last meeting when he and Dr. J Taylor Harden, Ph.D., would serve as Task Force co-chairs. Drs. Clifford Rosen and Keith Whitfield will take over as co-chairs. Drs. Bennett and Harden made the following suggestions:

- Focus on capturing high-quality candidates for the Butler-Williams Scholars Program, as well as the application success rate.
- Track and report on outcome of awardees who receive diversity supplements.
- Use the NIA tracking tool to compare numbers reported in inclusion tables with numbers actually realized by the studies.
- Help investigators learn how to engage with the diverse communities in which they work.

Drs. Bennett and Harden thanked NIA and the Council for the opportunity to serve as the Task Force co-chairs.

#### **IV. REPORT: WORKING GROUP ON PROGRAM**

Dr. Stephen Kritchevsky reported that the Working Group reviewed 16 requests for concept clearance. It recommended 15 for approval and deferred a vote on the concept pertaining to Alzheimer's Disease Sequencing Project Follow-Up Study 2.0: The Diverse Population Initiative.

The following four concepts presented by the Division of Extramural Activities (first three) and the Division of Geriatrics and Clinical Gerontology (last one) were approved with minimal discussion:

- Entrepreneurship and Innovation Training Program (ENRICH)
- NIA Academic Leadership Career Development Award
- NIA MSTEM: Advancing Diversity in Aging Research through Undergraduate Education

- Early-Phase Clinical Trials of Novel Interventions to Prevent, Delay, or Treat Aging-Related Conditions by Targeting Aging-Related Mechanisms

The Division of Aging Biology (DAB) presented two concepts for consideration.

#### Early Stage Investigator Research Using Non-Human Primate (NHP) Models

The proposed concept will use an R21 mechanism for a trans-NIH initiative led by NIA to provide 2 years of support to help early-stage investigators associated with the Primate Research Center advance their career. The Working Group suggested that NIA consider adding a K mechanism to attract more early-stage investigators into NHP research. The Group also noted that focusing only on investigators associated with the Primate Research Center may not be the optimal way to bring in newer investigators.

#### Osteoimmunology in Aging

The proposed concept aims to foster investments in this emerging field, which focuses on the dynamic and bidirectional functional interactions between bone and the immune system. It is a relatively new field, and most knowledge has been generated from work in younger individuals and rodent models. An NIA-supported Request for Applications (RFA) has supported pilot projects using aged models, and discussions from a 2018 workshop have suggested that adding a focus on aging would benefit the field overall. The proposed concept will use the R01 mechanism and solicit applications across a broad array of focus areas. The Working Group suggested that the concept incorporate a focus on the roles of adipocytes, inflammation, and the microbiome and allow for applications from both individual and multiple principal investigators.

The next five concepts were presented by the Division of Behavioral and Social Research (DBSR). Dr. Kritchevsky noted that several DBSR concepts addressed recommendations from the recent NACA review to work toward a better understanding of health disparities and provide more career development opportunities.

#### COPIAS: Capitalizing on Prior Investments in Animal Studies

The proposed concept will use a phased, milestone-driven R61/R33 mechanism to support the development and strengthening of infrastructure for aging research in animal models. It includes a call for methods to analyze behavioral and social processes and health measures across the lifespan, which will add value to the experimental models developed from a biomedical or geroscience perspective. The concept also proposes to expand on natural history studies and establish a data repository. The Working Group was enthusiastic about blending biobehavioral and life course aspects with ongoing opportunities in animal studies. Group members also thought the proposed concept was consistent with feedback from the recent NACA review of DBSR. However, they also expressed concern that the three aims did not align naturally. They suggested that the development and harmonization of a biorepository and tools be moved to another concept and that this concept focus on methodology.

## Mechanism-Focused Research to Promote Adherence to Healthful Behaviors to Prevent AD and ADRD

The proposed concept will use the R01 and R61/R33 mechanisms to support research on the psychological and interpersonal mechanisms of adherence in new, ongoing, and recently completed early- and late-stage trials in AD/ADRD. The concept will support a more in-depth approach to identify individual factors contributing to variability. The Working Group suggested that the concept incorporate a Coordinating Center or another mechanism to coordinate across studies to look at variability in a more cohesive and statistically significant manner. The Working Group also suggested that the concept focus on and specify populations that are most at risk.

## MIDUS: Midlife in the United States Renewal and MIDUS AD/ADRD Expansion

The MIDUS project, which began in the 1990s, has focused on several areas underlying psychological influences on health and cognition. It has been innovative in measurement and serves as a model for data-sharing. The proposed concept focuses on two modifications: conversion of MIDUS to a U19 cooperative agreement mechanism, and recommendations by the monitoring committee to extend the study period from 5 years to 6 years to accommodate an intensified assessment schedule. The Working Group noted that two projects within the U19 are focused strongly on AD/ADRD and recommended that these projects be viewed separately so that their contributions to AD/ADRD research can be tracked. The Working Group also suggested that MIDUS pay greater attention to the diversity of its sample.

## Networks to Develop Behavioral and Social Science Research in Aging

NIA has been using the R24 mechanism to fund research networks since 2009. DBSR has created 16 such networks. The proposed concept will renew critical networks focused on midlife reversibility, harmonization of the Health and Retirement Study international aging studies, biomarkers in population studies, and decision neuroscience and aging. The Working Group noted that each of these networks connects to milestones, goals, and specific recommendations from the NACA review of DBSR and will bring together researchers from different disciplines. It also suggested a focus on bringing together junior and senior investigators to fostering mentoring.

## Short Courses on Interdisciplinary Behavioral and Social Sciences Research in Aging

The proposed concept will use the R24 mechanism to support short courses and other educational activities for investigators interested in behavioral and social research in aging. These can include courses in genomics, reproducibility, cross-national dementia research using harmonized data, behavioral economics, AD/ADRD health care delivery, and applications of machine learning. The Working Group was highly enthusiastic about this concept and an excellent training resource. However, the Group suggested that NIA provide more details on how the courses would be offered, consider remote learning as a platform, and include an individual component on minority aging or the inclusion of race and ethnicity as factors.

The Division of Neuroscience (DN) presented five concepts for consideration:

### AD/ADRD Clinical Trials Short Course

The proposed concept will use the R25 mechanism to fund the development, implementation, and evaluation of 12-week courses on clinical trials in AD/ADRD. The courses would be geared toward graduate and medical students, postdoctoral fellows, and junior faculty, with an emphasis on including individuals from diverse backgrounds. The Working Group discussed the growing number and importance of AD/ADRD clinical trials and the specialized skill sets needed to conduct and lead such trials, the need to support the development of clinical trialists from diverse backgrounds, and mechanisms to include underrepresented groups in culturally sensitive and more effective ways. Group members noted that the concept would provide a cost-effective way to address an important need and suggested that NIA consider additional ways to support career development for participants from underrepresented backgrounds.

### Alzheimer's Disease Sequencing Project Follow-Up Study 2.0: The Diverse Population Initiative

The current AD Sequencing Project has conducted whole-genome sequencing on 50,000 individuals of Caucasian or European descent. Sequencing has been done on only 2,500 individuals of Hispanic descent and 6,700 of African descent, when sequencing is needed on at least 18,500 individuals of different backgrounds to identify potential differences in genetic risk. The proposed concept will support the sequencing of 25,000 additional whole genomes from individuals of diverse backgrounds. The Working Group was enthusiastic about the concept, but sought clarification on how the necessary numbers were calculated. A final vote on this concept was deferred pending additional information.

### Cellular Scale Connectome in Aging and AD

Selective vulnerability of specific brain regions is a feature of many neurodegenerative diseases. Techniques used by the Connectome Project and work in mouse models have revealed connections of interest in the rodent brain. The proposed concept will support research applying this work to mouse models of various AD/ADRD pathologies. Data will be made available to the public. Although the Working Group agreed on the need to map circuits of vulnerability, it also recommended that the FOA support a comprehensive characterization of brain circuits and that applications integrate data from human brain samples. It also cautioned that researchers need to be clear on what exactly their models focus on, as mouse AD/ADRD models mimic only certain aspects of AD. The proposed concept aims to use the R01 mechanism; the Working Group suggested that a U01 mechanism be added.

### New Approaches to Study the Dynamics of Neurogenesis in Brain Aging and AD

The proposed concept aims to support projects to develop new tools, technologies, and mechanistic insights to study the degree to which neurogenesis persists in humans of advancing age and in the context of neurodegenerative diseases. Projects will also explore whether efforts to promote or enhance neurogenesis, particularly in the hippocampus, has therapeutic value. The Working Group was enthusiastic about this concept. Because the concept seeks applications focused on technology development, mechanistic research, or a combination of the two, the Working Group suggested that NIA clearly define how applications can be responsive. It also suggested that NIA ensure that AD/ADRD is specified as an area of interest.

## NIA Fellowship and Career Development Awards to Promote Diversity in Translational Research for AD/ADRD

The proposed concept will support awards creating a training pipeline for predoctoral, postdoctoral, and junior faculty trainees from underrepresented backgrounds. The concept will emphasize the development and application of data science and drug discovery skills to AD/ADRD research, including population studies, behavioral and social research, and diagnostic and drug development. The Working Group suggested addition of a K99 mechanism to address the falloff in the transition between the postdoctoral and junior faculty levels. It also suggested incorporation of ongoing support, such as mentoring, grant-writing skills, and workshops on applying for tenure. A similar program supported by the National Institute of Diabetes and Digestive and Kidney Diseases was cited as a model.

### **V. COMMENTS BY RETIRING MEMBERS**

Before inviting retiring Council members to make remarks, Dr. Hodes and the Council paid homage to Dr. James Jackson, who passed away on September 1, 2020. Dr. Jackson served NIH in many ways, including service on NACA, the advisory council for the National Institute on Minority Health and Health Disparities, and the NIH Board of Scientific Counselors.

Dr. Bennett thanked NIA for the invitation to serve on Council and commended Dr. Robin Barr and Dr. Kenneth Santora for their leadership. He also praised NIA program staff for their dedication to research, out-of-the-box thinking, and efforts to bring in new investigators to aging research, and he expressed gratitude to his fellow Council members.

Dr. Harden acknowledged Council members' intellectual curiosity, ability to express scientific opinions, and advocate for science. She also acknowledged past and present NIA leadership and staff and named several who have taught her over the years. Dr. Harden expressed pride in NACA's accomplishments, particularly the DBSR review and the advocacy for a supplement program and for the Butler-Williams Scholars program.

Dr. David Holtzman thanked Dr. Hodes for the invitation to serve on the Council, noting that he had first met Dr. Hodes in the mid-90s as one of the first Beeson scholars. He noted the scientific progress in aging and AD research during his time on the Council, and he thanked NIA staff for their work and dedication to NIA goals.

Dr. Kritchevsky echoed other Council members' gratitude and acknowledged all he had learned from them and from NIA staff. He noted that his time on the Council was marked not only by the extraordinary growth in NIA-supported research made possible by the expansion of the NIA budget and the allocation of targeted funds toward AD research, but also by a growth in convergent science and cross-Division initiatives. This convergence marks a change in the way people are thinking about science. He commended the NIA staff and leadership for their passion and desire to see research succeed, as well as for their ability to conduct research while navigating an array of constraints.

Ms. Susan Peschin expressed her gratitude for the relationships she has developed at NIA and for having served with researchers and learned from them. She acknowledged the importance of the NIA leadership and staff and invited them to contact her if she can help with advocacy. Speaking

as an advocate, she asked NIA to assume a leadership role in the area of health economics and the issue of quality-adjusted life years, which feature more and more in coverage and reimbursement. She suggested that NIA work with the Patient-Centered Outcomes Research Institute to increase understanding of the value of health services and products. Ms. Peschin also encouraged her fellow Council members to visit different Divisions to help them become better advocates for the NIA.

## **VI. GUEST SPEAKER: NATIONAL INSTITUTE ON MINORITY HEALTH AND HEALTH DISPARITIES (NIMHD)**

Dr. Eliseo Pérez-Stable, NIMHD Director, gave a presentation on NIMHD's activities. He began by defining health disparities populations to include racial and ethnic minorities (as defined by the U.S. Census), individuals of lower socioeconomic status, underserved rural residents, and sexual/gender minorities. A health disparity is defined as a health outcome that is worse in these populations, compared with a reference population, as a result of social disadvantage that results in part from discrimination and being underserved in health care. NIMHD has established a Research Framework that it now uses as a guide, and investigators are encouraged to refer to it and consider multiple levels.

NIMHD has a modest budget—its FY20 budget was \$335 million—and its nascent intramural program accounts for only 2% of its budget. Approximately 45% of its budget is allocated to research project grants, and approximately 11% of its extramural funding budget has been allocated toward topics in aging research. Research topics in aging include neurocognitive function among American Indians, caregiving in Latino communities, the effects of racial inequality and accumulated stressors on epigenetic pathways, and racial/ethnic differences in the rates of dementia and in survival following diagnosis. NIMHD also has played a major role in NIH's Loan Repayment Program, an intervention that has promoted diversity in the biomedical workforce. Among its programs and activities are the following:

- The Research Centers in Minority Institutions (RCMIs), which supports research at minority-serving institutions and represents the Institute's commitment to training scientists from underrepresented groups.
- The Health Disparities Research Institute, a weeklong intensive training experience inspired by the Butler-Williams Scholars Program.
- The development of several FOAs to stimulate research in minority health and health disparities.
- Supplements, all within RCMIs, to support research in rural health disparities multi-sectoral research resource hubs.

Since the beginning of the COVID-19 pandemic, NIMHD has published a viewpoint highlighting concerns about the disproportionate burden of severe illness among Latino and African American individuals (Web Hooper M, Nápoles AM, Pérez-Stable EJ. 2020. JAMA Viewpoint: COVID-19 and Racial/Ethnic Disparities, *JAMA* (May 11)). In response to these concerns, NIMHD and several other Institutes and Centers have published notices of interest. NIMHD has solicited research on how state and local policies and initiatives mitigate or exacerbate disparities in health services use and health outcomes; the role that community-level

protective and resilience factors and interventions play in mitigating the sector disruptions caused by the pandemic; and how behavioral or biological mechanisms contribute to COVID-19 manifestations. In addition, NIMHD is leading the Rapid Acceleration of Diagnostics for Underserved Populations (RADx-UP) program to identify factors associated with disparities in COVID morbidity and mortality. The Community Engagement Research Alliance Against COVID-19 Disparities (CEAL) program, led by NIMHD and the National Heart, Lung, and Blood Institute, aims to address the potential lack of diversity and inclusion in vaccine trials and misinformation in communities of color. NIMHD has also launched a website within the PhenX Toolbox to aggregate core or basic measures of social determinants of health.

Dr. Pérez-Stable closed his presentation by sharing NIMHD-supported research findings and inviting Council to read a special *American Journal of Public Health* issue on New Perspectives to Advance Minority Health and Health Disparities Research, edited by Drs. Pérez-Stable and Francis Collins, NIH Director.

Council members commended NIMHD on the number of programs and initiatives it has implemented with a relatively modest budget. Dr. Pérez-Stable noted that NIMHD has placed an emphasis on the science rather than on capacity-building or diversity and inclusion. In response to questions about the Loan Repayment Program, Dr. Pérez-Stable noted that NIMHD has supported most of the applicants, but now other ICs can also fund the program.

## **VII. GUEST SPEAKER: NEURONS PUT OUT THE TRASH: A NOVEL FACET OF PROTEOSTASIS AND ORGANELLE QUALITY CONTROL**

Cells devote a considerable amount of resources to maintaining proteostasis and mitochondrial quality, with an emphasis on degradation through internal controls such as protein-folding chaperones, proteasome degradation, autophagy, and mitophagy. However, an aging neuron faces increased protein aggregation and mitochondrial dysfunction. Dr. Monica Driscoll, Council member, described work in *C. elegans* to understand these mechanisms. Her laboratory has observed that the touch receptor neurons in *C. elegans* concentrate toxic proteins and release them through vesicles called exophers. These vesicles form through a distinct mechanism that features a tunneling nanotube-like step and involves genes similar to those that play a role in mammalian aggresomes. The number of exophers increases in response to toxic protein overexpression or compromised proteostasis, but exophers can also expel organelles such as mitochondria. Dr. Driscoll's laboratory has identified food withdrawal, osmotic stress, and oxidative stress as triggers that increase exopher formation. However, they have also observed an upper stress limit at which exopher formation stops.

In the short term, exopher formation selectively removes trash without compromising neuronal function or touch circuit functionality. However, over the entire lifespan of the worm, neurons that produced exophers in response to stress age poorly and die more quickly. Thus, exopher formation, while beneficial in the short term, can make neurons more vulnerable to stress. In addition, exophers travel to the hypodermis and disperse in the hypodermal lysosome network. However, aggregates they expel are not degraded; they are taken up by coelomocytes instead.

In summary, exopher formation appears to be a mechanism by which neurons take out the trash. Although the mechanisms by which trash is identified and sorted are still unclear, increased

understanding of exopher biology may provide insight into the mechanisms that underlie aggregate spreading in neurodegenerative diseases.

Council members asked about the percentage of genes in the *C. elegans* genome that have homologs or orthologs in humans. They also suggested that Dr. Driscoll's laboratory look at exopher formation in models carrying mutations associated with amyotrophic lateral sclerosis or dysfunctional alpha-synuclein.

## **VIII. ADJOURNMENT**

The open session of the 141st meeting of the National Advisory Council on Aging adjourned at 1:15 p.m. on September 9, 2020. The next meeting is scheduled for January 12-13, 2021.

## **IX. CERTIFICATION**

I hereby certify that, to the best of my knowledge, the foregoing minutes and attachments are accurate and complete.<sup>3</sup>

Richard J. Hodes, M.D.  
Chairman, National Advisory Council on Aging  
Director, National Institute on Aging

Prepared by Kenneth Santora, Ph.D.  
With assistance by Rose Li and Associates, Inc.

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<sup>3</sup> These minutes will be approved formally by Council at the next meeting on January 12-13, 2021, and corrections or notations will be stated in the minutes of that meeting.