Integrating the Science of Aging and Environmental Health Research

A Workshop of the Standing Committee on the Use of Emerging Science for Environmental Health Decisions

June 9-10, 2020

This is a virtual event
All times listed are Eastern Daylight Time

PRELIMINARY AGENDA

With the global population living longer—the number of people worldwide aged 80 years or over is projected to triple by 2050—understanding the factors that influence healthy aging throughout our lifetimes is critical for protecting public health. Scientists have long known that environment plays an important role in aging: for example, research has shown that human exposure to environmental pollutants can exacerbate age-related diseases, such as Alzheimer’s and Parkinson’s. However, many questions remain about the mechanisms through which environmental stressors influence aging, longevity, and the etiology of age-related disease. How do environmental pollutants, such as airborne particulate matter and pesticides, alter the biological processes that underlie human aging and longevity?

This workshop will explore emerging research at the intersection between aging, longevity, environmental exposures, and human health. Workshop speakers will detail emerging research findings through two lenses:

1. How environmental exposures influence or mediate aging; and
2. How aging influences environmentally-mediated health outcomes.

Participants will also explore research opportunities and needs, enabling technologies and analytical tools, and mechanisms to anticipate and use new data to inform decisions about personal health choices, public health and medical practice, or environmental regulation.

Join the conversation: #ESEHDWorkshop

Welcome and Context for the Workshop

10:00 Keegan Sawyer, National Academies of Sciences, Engineering, and Medicine
    Andrea Hodgson, National Academies of Sciences, Engineering, and Medicine
    Emma Alme, National Academies of Sciences, Engineering, and Medicine Policy Fellow

10:05 Michelle Heacock, National Institute of Environmental Health Sciences

10:15 Environmental determinants of aging-why not measure everything?
    Gary Miller, Columbia University
10:25 Integration of the Science of Aging with Environmental Health Research Through the Perspective of Biomarkers
  Luigi Ferrucci, National Institute of Aging

10:45 Contributions of Toxicants to the Development of Age-Related Diseases
  Julie Andersen, Buck Institute

11:05 Break

SESSION 1: EMERGING TRENDS AND TOOLS IN BIOLOGICAL AGING RESEARCH

11:20 Key molecular pathways of aging
  Rafael de Cabo, Intramural Research Programs, National Institutes of Health

11:35 Single cell analytical techniques in aging research
  Murat Acar, Yale University

11:50 Break for Lunch (30 minutes)

12:20 Ageotypes: molecular pathways of aging in people
  Mike Snyder, Stanford

12:35 Leveraging Omics profiling to estimate biological age
  Nathan Price, Institute for Systems Biology

12:50 Panel Discussion: Exploring Potential Connections between Biological Age and Exposures
  Moderator: Donna Mendrick, Food and Drug Administration
  Luigi Ferrucci, National Institute of Aging
  Julie Andersen, Buck Institute
  Andrew Geller, U.S. Environmental Protection Agency
  Nathan Price, Institute for Systems Biology

1:20 Break

SESSION 2: EXPLORING EMERGING AREAS OF INTEGRATION – EXPOSURES AND AGING PROCESSES

1:35 Integrating exposure science and development of age-related neurogenerative disease in molecular and population research
  Caleb Finch, University of Southern California

Air Pollution Exposures

1:50 Particle exposures and aging biomarkers: findings from the VA normative aging study
  Jamaji Nwanaji-Enwerem, Harvard University
Air pollution and the development of cardiovascular disease: the MESA Air project
Joel Kaufman, University of Washington

Integrating Exposure and Other Stressors

Racial disparities in cardiometabolic risk with age
Uchechi Mitchell, University of Illinois at Chicago

Maternal stress, particle matter exposure, and development
Rosalind Wright, Mount Sinai

Panel Discussion (30 minutes)
Moderator: JC Chen, University of Southern California
Caleb Finch, University of Southern California
Jamaji Nwanaji-Enwerem, Harvard University
Rosalind Wright, Mount Sinai
TBD

Closing remarks

END

Day 2

Chemical Exposures

Opening Remarks

Pesticides and the development of neurodegenerative disorders
Beate Ritz, University of California, Los Angeles

The influence of chemical exposures on development
John Meeker, University of Michigan

Heavy Metal Exposures

The effects of arsenic toxicity on telomeres
Brandon Pierce, University of Chicago

The epigenetic impact of prenatal heavy metal exposure
Andres Cardenas, University of California, Berkeley
11:05  Panel Discussion (30 minutes)
Moderator: Kristen Malecki, University of Wisconsin-Madison
       John Meeker, University of Michigan
       Beate Ritz, University of California, Los Angeles
       Emma Lavoie, U.S. Environmental Protection Agency
       TBD
11:35  Break for lunch

SESSION 3: INTEGRATING THE SCIENCE OF AGING AND ENVIRONMENTAL
HEALTH: CONSIDERATIONS FOR DECISION-MAKING (Concurrent Breakout
Brainstorming Sessions)

12:05  Explain breakout activity

12:15  Breakout session (45 minutes)
Group A – Research Priorities
       Jennifer Przybyla, ATSDR
       Jean Harry, NIEHS
       Gina Solomon, UCSF
       Mary Ann Ottinger, University of Houston
       Joel Kaufman, University of Washington

Group B – Translational Priorities
       Sandra Howard, Health and Human Services
       Emma Lavoie, Environmental Protection Agency
       Gary Ginsberg, New York Department of Public Health
       Mark Miller, CAL EPA
       TBD
       TBD

1:00  Panel 3 Discussion (45 minutes)
Moderator: Kathy James, Colorado University
       Kristi Pullen Fedinick, Natural Resources Defense Council
       Joel Kaufman, University of Washington
       Wayne Cascio, Environmental Protection Agency
       Chandra Jackson, National Institutes of Health
       Luigi Ferrucci, National Institute of Aging

1:45  Closing Remarks - Kristen Malecki, University of Wisconsin-Madison

2:00  END
Organizing Committee:

Murat Acar, Yale University
Jiu-Chiu (JC) Chen, Keck School of Medicine of USC
Katherine A. James, Colorado University
Kristen Malecki, University of Wisconsin-Madison
Donna L. Mendrick, National Center for Toxicology Research, U.S. Food and Drug Administration
Gary Miller, Columbia University
Mary Ann Ottinger, University of Houston