The 2022 Harvard / Paul F. Glenn

Virtual Symposium on Aging

May 16, 2022

GLENN FOUNDATION
FOR MEDICAL RESEARCH

BLAVATNIK INSTITUTE
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The Paul F. Glenn Center for the Biology of Aging Research

The Paul F. Glenn Center for the Biology of Aging

Welcome to the Annual Harvard/Paul F. Glenn Symposium on Aging. Each year, the Paul F. Glenn Center for Biology of Aging Research hosts the Harvard Symposium on Aging with a mission to present new advances in aging research and to stimulate collaborative research in this area. The symposium has grown to be a significant forum for aging research at Harvard Medical School over the years.

We wish to acknowledge the generosity and vision of Paul F. Glenn, Leonard Judson, and Mark Collins for their unwavering support of aging research through the Glenn Foundation for Medical Research. Thanks to their help, we now have a vibrant community of researchers who study aging and age-related diseases at Harvard Medical School.

The reasons for accelerating research into the molecular biology of aging are clear. First and foremost, the number of aged individuals in developed countries is proliferating, which will place an unprecedented burden on the social fabric and economic infrastructure. Because chronic illness in the elderly is a major medical cost, enormous savings would be achieved if the healthy lifespan were extended through a greater understanding of age-related diseases. A study by the RAND Corporation concluded that advances in medicine arising from aging research would be one of the most cost-effective approaches to age-related disease. Advances in aging research have shown that it is possible to extend the healthy lifespan of laboratory animals. A greater understanding of age-related biological processes might lead to novel therapeutic approaches to the diseases of aging, such as diabetes, cancer, Alzheimer's, and heart disease.

On behalf of The Paul F. Glenn Center for Biology of Aging Research and Harvard Medical School, we welcome you to the 2022 virtual Annual Harvard/Paul F. Glenn Symposium on Aging.

David Sinclair and Bruce Yankner

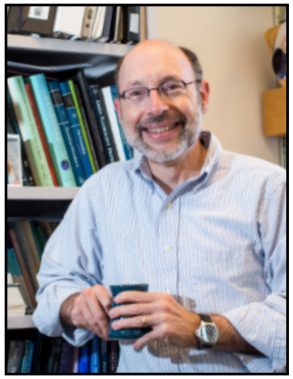
Co-Directors, Paul F. Glenn Center for Biology of Aging Research

Symposium on Aging
Agenda

May 16, 2022
1:00 PM - 6:00 PM

1:00 PM to 1:10 PM	Kevin Lee, Ph.D. Glenn Foundation
1:10 PM to 1:15 PM	Speaker Introduction by David Sinclair, A.O., Ph.D. Harvard Medical School
1:15 PM to 2:00 PM	Bradley Hyman, M.D., Ph.D. Massachusetts General Hospital
2:00 PM to 2:30 PM	Dudley Lamming, Ph.D. University of Wisconsin
2:30 PM to 3:15 PM	Alison Goate, Ph.D. Ichan School of Medicine at Mount Sinai
3:15 PM to 3:20 PM	Bruce Yankner M.D., Ph.D - Speaker Introduction
3:20 PM to 3:50 PM	Martin Aryee, Ph.D. Massachusetts General Hospital
3:50 PM to 4:35 PM	David Sinclair, A.O., Ph.D. Harvard Medical School
4:35 PM to 5:05 PM	Alison Ringel, Ph.D. MIT
5:05 PM to 5:50 PM	Morgan Levine, Ph.D. Yale School of Medicine

Bradley Hyman, MD., Ph.D.



Brad Hyman is the Director of the Massachusetts Alzheimer's Disease Research Center at MGH and the John B. Penney, Jr. Professor of Neurology at Harvard Medical School. He also directs the Alzheimer's Laboratory unit at Mass General Institute for Neurological Disease, with the goal of understanding the neuropathophysiologic and genetic factors that underlie dementia. Dr. Hyman is author of over 600 papers.

Dr. Hyman received his M.D. and Ph.D. from University of Iowa, and he has received the Metropolitan Life Award, the Potamkin Prize, an NIH Merit award, and an Alzheimer's Association Lifetime Achievement Award. He is a member of the National Academy of Medicine.

Dudley Lamming, Ph.D.

Dr. Dudley Lamming is an Associate Professor of Medicine at the University of Wisconsin-Madison and Director of the UW-Madison Comprehensive Diabetes Center Mouse Phenotyping and Surgery Core. Dr. Lamming received his PhD in Experimental Pathology from Harvard University in 2008. He subsequently completed postdoctoral training at the Whitehead Institute for Biomedical Research, where he discovered that many of the deleterious effects of rapamycin, a pharmaceutical that extends lifespan by inhibiting the protein kinase mTORC1, were mediated by "off-target" inhibition of a second complex, mTORC2. Dr. Lamming is the author of over 75 peer-reviewed papers and the recipient of several prestigious awards, including the 2018 Nathan Shock New Investigator Award from the Gerontological Society of America. He is a fellow of the American Aging Association and of the Gerontological Society of America, and is President-Elect of the American Aging Association. His NIH-supported laboratory at the University of Wisconsin-Madison studies how diets with altered levels of specific dietary macronutrients can promote longevity and be used to prevent or treat age-associated diseases, including diabetes and Alzheimer's disease.

Informational noise as a conserved cause of aging

Dietary amino acids and healthy aging

Alison, Goate, Ph.D.

I am a molecular geneticist with 34 years of experience in the application of molecular genetics and genomic approaches to the identification and characterization of the molecular mechanisms underlying genetic risk factors. I have a well-funded research program that has had continuous funding for the last twenty-eight years and has resulted in over 550 peer-reviewed publications. My laboratory has been central to the identification of several genes causing inherited neurological disorders including amyloid precursor protein and presenilins in Alzheimer's disease, microtubule associated protein and progranulin in frontotemporal dementia and TDP43 in ALS. For the last 10 years my lab has focused on the genetics of late onset AD. We were involved in the initial discovery of TREM2 as an AD risk factor (Guerreiro et al., 2013). For the last 6 years we have focused on the role of myeloid cells in AD risk. In Huang et al., 2017 we linked a network of AD risk genes to a novel myeloid expressed AD risk gene, SPI1. More recently we have taken a genome-wide approach to integrating genomic and epigenomic data with genetic data to identify novel genetic causes of AD. This has resulted in the identification of novel AD risk genes coding for endolysosomal proteins (Novikova et al., Nat. Comm.). We have also used induced pluripotent stem cell models to study the role of AD risk variants in AD & FTD (Bowles et al., submitted). We have also focused on the development of induced pluripotent stem cell models to study the role of AD risk variants in neurodegeneration (TCW et al., in revision). I have a proven track record of mentorship. All of the research in my lab is carried out by scientists in training-junior faculty, postdoctoral researchers and graduate students. In the last twenty-eight years I have been the primary mentor for 18 junior faculty/K awardees, 24 post-doctoral fellows and 18 graduate students. These trainees include both women and under-represented minorities. Many of my former trainees are now independent investigators at top ranked academic institutions.

Genetics implicate microglial function in AD risk

Martin Aryee, Ph.D.

Martin Aryee is an Institute member of the Broad Institute, an associate professor in the Department of Data Science at Dana-Farber Cancer Institute (DFCI), and director of hematologic malignancies, biostatistics and computational biology at DFCI. He holds a secondary appointment as an assistant professor in the Department of Biostatistics at the Harvard T.H. Chan School of Public Health, where he teaches an introductory course in statistical genetics. The Aryee lab develops statistical analysis methods for studying the genetic and epigenetic basis of cancer and other diseases. Most of their work has focused on improving our understanding of how aberrations in the physical and chemical structure of DNA within the nucleus are linked to cancer and other common diseases. His lab also develops tools that aim to enable the safe translation of gene editing techniques such as CRISPR into human therapeutics.

3D genome reorganization in aging and cancer

David Sinclair, A.O., Ph.D.

David A. Sinclair, Ph.D., A.O. is a Professor in the Department of Genetics, Blavatnik Insitute, and co-Director of the Paul F. Glenn Center for Biology of Aging Research at Harvard Medical School. He is best known for his work on understanding why we age and how to slow its effects. He obtained his Ph.D. in Molecular Genetics at the University of New South Wales, Sydney, in 1995 and did his postdoctoral research at M.I.T. with Dr. Leonard Guarente where he co discovered a cause of aging for yeast as well as the role of Sir2 in epigenetic changes driven by genome instability and aging. In 1999 he moved to Harvard Medical School and has primarily focused on understanding why we age and the role of protective enzymes called the sirtuins, which respond to changing NAD+ levels, exercise, and caloric restriction (CR). The Sinclair lab was the first to identify a role for NAD biosynthesis in regulation of lifespan and first showed that sirtuins are involved in CR's benefits in mammals and identified the first small molecules that activate SIRT1 (STACs). His lab is currently focusing on epigenetic changes as a driver of aging and the use of reprogramming factors to reset the age of cells and tissues. He is the New York Times bestselling author for Lifespan (2019), has published over 200 scientific papers, is a co-inventor on over 50 patents, and has co-founded biotechnology companies in the areas of aging, vaccines, diabetes, fertility, cancer, and biodefense. He serves as co-chief editor of the scientific journal Aging and has received 35 honors including the Australian Medical Research Medal, the Irving Wright Award, the NIH Director's Pioneer award, TIME magazine's list of the "100 most influential people in the world" and the "Top 50 people in Healthcare". In 2018, he became an Officer of the Order of Australia (AO).

Alison Ringel, Ph.D.

Alison Ringel is a T-cell immunologist with a background in biochemistry, biophysics, and structural biology. She investigates how environmental factors such as aging, metabolism, and diet impact tumor progress and the immune responses that cause tumor control. She received a PhD in molecular biophysics from John Hopkins University School of Medicine. Previously, Alison was a postdoctoral fellow in the Department of Cell Biology at Harvard Medical School. She recently joined MIT as an assistant professor in the Department of Biology and a core member of the Ragon Institute this past January.

Targeting epigenetic regulators to control aging in mice and humans

Immune aging in the tumor nich

Morgan Levine, Ph.D.

Dr. Morgan Levine is a founding PI at Altos Labs and formerly a ladder rank professor at Yale University School of Medicine. Levine is considered a leader in the biology of aging, most famous for generating cutting-edge methods for quantifying the system dysregulation that occurs over an organisms' lifetime. Her work relies on interdisciplinary approaches, integrating theories and techniques from bioinformatics and cellular and molecular biology to track trajectories aging cells and organisms take over time. Her vision is to link molecular changes in aging, development, and reprogramming to dynamical features of cells and to uncover how these alterations impact homeostasis at the tissue or organ-system level. Levine has received numerous awards for her work, including the Vincent Cristofalo Rising Star Award in Aging Research in 2021 and the Nathan Shock New Investigator Award in 2020.

Epigenetic landscapes in aging and reprogramming

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