

The 2018 Harvard / Paul F. Glenn

Symposium on Aging

June 25, 2018



GLENN FOUNDATION
FOR MEDICAL RESEARCH



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

Welcome to the 13th Annual Harvard/Paul F. Glenn Symposium on Aging. Each year, the Paul F. Glenn Center for 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 over the past 12 years to be one of the biggest events at Harvard Medical School. We have been fortunate to have many of the leaders in the aging field speak at the symposia and today is no exception.

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

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 growing rapidly, 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 through genetic and pharmacological means. We anticipate that significant strides will be made in understanding how human health and lifespan are regulated, leading to novel therapeutic approaches to the diseases of aging, such as diabetes, cancer, Alzheimer's and heart disease.

Today's attendees come not only from the Harvard research community, but from across the nation and from overseas for this event. On behalf of The Paul F. Glenn Center for the Biology of Aging Research and Harvard Medical School, we welcome you to this Special 13th Annual Harvard/Paul F. Glenn Symposium on Aging, 2018.

David Sinclair and Bruce Yankner
Co-Directors, Paul F. Glenn Center for Aging Research

Symposium on Aging Agenda

June 25, 2018
1:00 PM - 5:00 PM

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| 1:00 p.m. | Welcome
Harvard Medical School
Mr. Mark Collins, President
Glenn Foundation for Medical Research |
| 1:15 p.m. | Junying Yuan, Ph.D.
Harvard Medical School |
| 2:00 p.m. | Steve Horvath, Ph.D.
University of California, Los Angeles |
| 2:45 p.m. | T. Keith Blackwell, Ph.D., M.D.
Joslin Diabetes Center |
| 3:30 p.m. | Manuel Serrano, Ph.D.
Institute for Research in Biomedicine, Barcelona |
| 4:15 p.m. | Public Social |

Junying Yuan, PhD



Junying Yuan received her Ph.D. in Neuroscience from Harvard University in 1989 and her undergraduate degree from Fudan University, Shanghai, China, in 1982. Dr. Yuan carried out her Ph.D. thesis work at the Massachusetts Institute of Technology in the laboratory of H. R. Horvitz. She was first appointed as Assistant Professor at Harvard Medical School in 1992, when she became a Principal Investigator of the Cardiovascular Research Center at Massachusetts General Hospital. She joined the Department of Cell Biology in 1996 and was appointed a Professor of Cell Biology at Harvard Medical School in 2000. In 2014, Dr. Yuan was appointed as Elizabeth D. Hay Professor of Cell Biology, a Professorship honors the late Professor Elizabeth D. Hay, the first female full professor in the history of Harvard Medical School.

Dr. Yuan is a pioneer and a leader in the cell death field. Dr. Yuan made transformative discoveries on two distinct forms of cell death, apoptosis and necroptosis in mammalian cells. Her discovery of mammalian caspases led to a molecular era in apoptosis research. Her development of necrostatins demonstrated the existence and significance of a regulated necrosis mechanism, termed necroptosis, in human degenerative diseases. Dr. Yuan's accomplishments have been honored by many awards including the Innovator Award for Breast Cancer Research and NIH Director's Pioneer award. She is a fellow of the American Academy of Arts and Sciences, a fellow of the American Association for the Advancement of Sciences and a member of the National Academy of Sciences (US).

Steve Horvath, PhD



It has been difficult to identify and validate molecular targets of interventions that extend human health and life span because most clinical biomarkers are not sufficiently representative of the fundamental mechanisms of ageing. In a recent breakthrough, biomarkers of ageing based on DNA methylation have enabled accurate age estimates for any tissue across the entire life course. These multi-tissue 'epigenetic clocks' link developmental and maintenance processes to biological ageing and hence give rise to a unified theory of life course. These epigenetic biomarker may help to address long-standing questions in many fields, including the central question: why do we age?

The Role & Mechanism of RIPK1 in Age-dependent Neurodegenerative Diseases

The Epigenetic Clock Theory of Aging

Keith Blackwell, MD, PhD



Dr. Blackwell received a BS in Chemistry from Duke University in 1978, and the MD and PhD degrees from Columbia University in 1987 and 1988, respectively. He performed his graduate and initial postdoctoral work with Dr. Frederick W. Alt, with whom he studied the mechanism and regulation of B- and T- cell receptor gene assembly. In 1989 he joined the lab of Dr. Harold Weintraub (Fred Hutchinson Cancer Research Center) as a postdoctoral fellow of the Life Sciences Research Foundation. He

then developed in vitro selection systems for analyzing protein-nucleic acid interactions, and studied how various transcription factors recognize DNA sequences. In 1993 he became a Junior Investigator at the Center for Blood Research (now IDI), and an Assistant Professor of Pathology at Harvard Medical School. He was named a Searle Scholar in 1995. He became an Associate Professor in 2001, and in 2004 moved to the Joslin Diabetes Center, where he is Head of the Section on Developmental and Stem Cell Biology, a Staff Member of the Board of Trustees, and a principal faculty member of the Harvard Stem Cell Institute. His lab uses the *C. elegans* model to investigate how SKN-1 and other transcription regulatory networks defend against free radicals and environmental stresses, and influence longevity. They also study mechanisms that regulate gene expression programs during germ cell and early embryo development

Manuel Serrano, PhD



Manuel Serrano obtained his PhD in 1991, from the Universidad Autónoma de Madrid. From 1991 to 1996, Serrano worked in the team of David Beach in Cold Spring Harbor Laboratory, NY. During this period, Serrano made his most important discovery with the identification and characterization of the gene p16, one of the most important genes for anti-cancer protection. Serrano returned to Spain in 1997 to lead a research group, first at the National Center of Biotechnology (CNB), and then, from 2003 to 2017, at the Spanish National Cancer Research Center (CNIO), both in Madrid. In 2017, Serrano moved to the Institute for Research in Biomedicine (IRB), in Barcelona.

Manuel Serrano is internationally recognized in the field of tumor suppression. In addition to the discovery of p16, one of his main discoveries has been the identification of cellular senescence as a main anti-oncogenic response. Recently, his laboratory has also shown that cellular senescence participates in several tissue remodeling processes during embryo development. The Serrano team was pioneer in the generation of genetically-modified mice resistant to cancer and found a link between tumor suppressor genes and aging.

In recent years, the research interests of Manuel Serrano have extended to metabolism and cellular reprogramming in relation to aging. The Serrano laboratory was first in demonstrating that cellular reprogramming into pluripotency is possible within an organism, and this discovery was considered Advance of the Year 2013 by Nature Medicine. More recently, Serrano has reported in Science that in vivo reprogramming is enhanced by the coexistence of tissue injury thanks to the production of the interleukin IL-6.

The focus of his laboratory is now to apply their knowledge on senescence and reprogramming to degenerative diseases such as lung, kidney and heart fibrosis.

**Nutrient Signals Modulating Growth, Immunity,
and Longevity**

**New Tools Against Aging: Senolysis &
Reprogramming**



Nearby locations for lunch:

1. Elements Café

located at Harvard Medical School, New Research Building

2. Bertucci's

(at Children's), 1 Blackfan Circle (Exit rear of Harvard Medical School)

3. Galleria Longwood Food Court

342 Longwood Avenue

