The 2016 Harvard / Paul F. Glenn

Symposium on Aging

June 17, 2016

The Paul F. Glenn Center for the Biology of Aging

Welcome to the 11th Annual Harvard/Paul F. Glenn Symposium on Aging. Each year, the Paul F. Glenn Center for the Biology of Aging 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 10 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. Since the inception of the Paul F. Glenn labs at Harvard in 2005, this network has grown to include AFAR, BAAM, Buck Institute, Albert Einstein College of Medicine, Mayo Clinic, MIT, Princeton University, Stanford University, Salk Institute, USCF, Berkeley and the University of Michigan.

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 one day event. On behalf of The Paul F. Glenn Center for the Biology of Aging and Harvard Medical School, we welcome you to this Special 11th Annual Harvard/Paul F. Glenn Symposium on Aging, 2016.

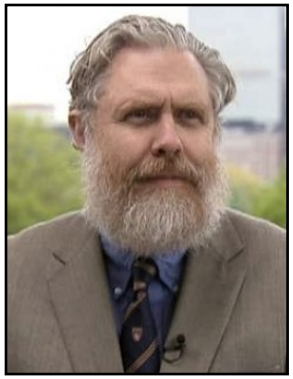
David Sinclair and Bruce Yankner
Co-Directors, The Paul F. Glenn Laboratories at Harvard Medical School

Symposium on Aging
Agenda

June 17, 2016
9:00 - 5:00

9:00 – 9:15 a.m.	**Welcome** Harvard Medical School Mark Collins, President Glenn Foundation for Medical Research
9:15 – 10:00 a.m.	**Advances in Age Reversal** George Church, Ph.D.
10:00 – 10:45 a.m.	**Hydrogen Sulfide & Dietary Restriction Benefits** Jay R. Mitchell, Ph.D.
10:45 – 11:30 p.m.	**Comparative Genomics of Aging** Vadim Gladyshev, Ph.D.
11:30 – 12:15 p.m.	**The Splice of Life: RNA Homeostasis & Longevity** William Mair, Ph.D.
12:15 – 1:30 p.m.	Lunch
1:30 – 2:15 p.m.	**Cellular Senescence: The Path to Translation** James L. Kirkland, M.D., Ph.D.
2:15 – 3:00 p.m.	**Mitochondrial Regulation of Stem Cell Aging** Danica Chen, Ph.D.
3:00 – 3:45 p.m.	**Interventions for Healthy Living** Rafa deCabo, Ph.D.
3:45 – 4:30 p.m.	**mTOR pathway in Aging & Chronic Disease** Brian Kennedy, PhD
4:30 – 5:00 p.m.	Public Social

George Church, Ph.D.



George Church is Professor of Genetics at Harvard Medical School and Director of PersonalGenomes.org, which provides the world's only open-access information on human Genomic, Environmental & Trait data (GET). His 1984 Harvard PhD included the first methods for direct genome sequencing, molecular multiplexing & barcoding. These led to the first genome sequence (pathogen, Helicobacter pylori) in 1994 . His innovations have contributed to nearly all "next generation" genome sequencing methods and companies (CGI, Life, Illumina, nanopore). This plus chip-based DNA synthesis and stem cell engineering resulted in founding additional application-based companies spanning fields of medical diagnostics (Knome, Alacris, AbVitro, Pathogenica) & synthetic biology / therapeutics (Joule, Gen9, Editas, Egenesis, enEvolv, WarpDrive).

He has also pioneered new privacy, biosafety , environmental & biosecurity policies. He is a director of NIH Center for Excellence in Genomic Science. His honors include election to NAS & NAE & Franklin Bower Laureate for Achievement in Science. He has coauthored 370 papers, 60 patents & one book (Regenesis).

Jay R. Mitchell, Ph.D.

James R. Mitchell, Ph.D., is an Associate Professor in the Department of Genetics & Complex Diseases at the Harvard T. H. Chan School of Public Health. Dr. Mitchell completed his doctoral training at UC Berkeley on human telomerase biochemistry and his post-doctoral studies at Erasmus University in Rotterdam, the Netherlands on the genetics of DNA repair and aging. He started his own lab at the Harvard Chan School in 2008 where the main focus is on understanding how restriction of calorie/ nutrient intake can increase stress resistance, improve metabolic fitness and extend longevity. The Mitchell lab has found that restriction of dietary protein intake for up to one week improves metabolism and protects against surgical stress in pre-clinical models. Mechanistically, these benefits require nutrient-sensing mechanisms that detect the presence or absence of specific amino acids and translate this information into altered energy metabolism and oxidative stress resistance. Recent work has focused on the role of increased production of the protective gas, hydrogen sulfide, in response to nutrient restriction. Dr. Mitchell's long-term goal is to translate these findings to best practice in the clinic, including what we should or shouldn't eat, and for how long, before a planned major stress such as surgery. He has been recognized with an Ellison Medical Foundation New Scholar Award in Aging, an American Federation for Aging Research Award and the Glenn Award for Research in Biological Mechanisms of Aging.

Advances in Age Reversal

Dietary Restriction and Hydrogen Sulfide Metabolism

Vadim Gladyshev, Ph.D.

Dr. Vadim N. Gladyshev is a Professor of Medicine at Brigham and Women's Hospital, Harvard Medical School, Director of the Center for Redox Medicine, and Associate Member of the Broad Institute. Dr. Gladyshev graduated with highest honors (1988) and received his Ph.D. (1992) from Moscow State University, Russia, followed by postdoctoral training (1992-1997) at the National Institutes of Health with Drs. Thressa Stadtman and Dolph Hatfield. In 1998, he joined the University of Nebraska faculty, where he became a Charles Bessey Professor of Biochemistry in 2005 and the Director of the Redox Biology Center in 2007. Since 2009, he has been a Professor of Medicine at Brigham and Women's Hospital, Harvard Medical School. Dr. Gladyshev has been working in the areas of redox biology and selenium as applied to aging and cancer. He has a long-term interest in the mechanisms of aging and regulation of lifespan. His research uses a variety of model organisms and applies high-throughput approaches to achieve systems level understanding of aging. His work on the naked mole rat and Brandt's bat represents the first examples of genome sequencing carried out with the primary goal of understanding longevity. To date, Dr. Gladyshev has published approximately 300 articles and elected as an AAAS fellow. He is a recipient of the NIH Eureka, Merit, and most recently the NIH Director's Pioneer Award to study mechanisms of lifespan control.

Comparative Genomics of Aging

William Mair, Ph.D.

William Mair, PhD, obtained a BS in genetics from University College London and a PhD in biology from the UCL Center for Healthy Aging in London. He then went on to pursue his postdoctoral research at the Salk Institute for Biological Studies in La Jolla, California, before joining the Harvard T.H. Chan School of Public Health as assistant professor of genetics and complex diseases in 2011. Dr. Mair's career has focused on leveraging molecular and genetic tools in model species to reveal mechanisms by which dietary restriction promotes healthy aging. By uniquely focusing on energetics and metabolism during aging, Dr. Mair's work aims to maximize health impact by reducing systemic disease risk in patients. The Mair Lab uses a combination of genetics, molecular biology, and biochemical approaches to identify novel therapeutic targets that might increase health in the elderly.

The Splice of Life: RNA Homeostasis & Longevity

James L. Kirkland, M.D., Ph.D.

James L. Kirkland, M.D., Ph.D., is the director of the Robert and Arlene Kogod Center on Aging at Mayo Clinic and Noaber Foundation Professor of Aging Research. Dr. Kirkland's research is on cellular senescence, age-related adipose tissue and metabolic dysfunction, and development of agents and strategies for targeting fundamental aging mechanisms to treat age-related chronic diseases and disabilities. He recently published the first article about drugs that clear senescent cells – senolytic agents. He is a scientific advisory board member for several companies and academic organizations. He is a member of the National Advisory Council on Aging of the National Institutes of Health, past chair of the Biological Sciences Section of the Gerontological Society of America, and a member of the Board of the American Federation for Aging Research. He holds honorary appointments at Boston University and the University of Groningen in the Netherlands. He is a board certified specialist in internal medicine, geriatrics, and endocrinology and metabolism.

Danica Chen, Ph.D.

Danica Chen is an Associate Professor of Metabolic Biology, Nutritional Sciences & Toxicology at University of California at Berkeley, a member of Berkeley Stem Cell Center, and a member of QB3 Consortium in Lifespan Extension. She is a Searle Scholar, an Ellison Scholar, a Kavli Fellow, and a Hellman Fellow. Dr. Chen received Ph.D. in molecular and cell biology from University of California at Berkeley and obtained postdoctoral training in biology at Massachusetts Institute of Technology. Her research aims to understand the molecular and cellular mechanisms underlying aging-associated conditions and elucidate which aspects of aging-associated conditions are reversible. Recent studies from her lab have revealed mitochondrial stresses as causes of stem cell exhaustion and tissue degeneration during aging. She identified mitochondrial stress resistance programs that become dysregulated in aged stem cells, and demonstrated these programs can be targeted to improve survival and regenerative capacity of aged stem cells. These findings give hope for targeting aging-associated dysregulated cellular protective programs, such as the pathways regulated by NAD+-dependent enzymes sirtuins, to reverse stem cell aging, tissue degeneration and dysfunction.

Cellular Senescence: The Path to Translation

Mitochondrial Regulation of Stem Cell Aging

Rafa deCabo, Ph.D.

After receiving his B.S. and M.S. from the University of Cordoba, Spain, Dr. de Cabo earned his Ph.D. in 2000 from the Department of Foods and Nutrition at Purdue University. Upon completion of his graduate education, he received a postdoctoral position in the Laboratory of Neurosciences at the National Institute on Aging in Baltimore, Maryland. In 2004, he was appointed as a tenure track investigator in the Laboratory of Experimental Gerontology. He was tenured in 2009 and now he now heads the Translational Gerontology Branch at the NIA. Dr. de Cabo is also the Editor In Chief of Journals of Gerontology, Biological Sciences.

Brian Kennedy, Ph.D.

Dr. Brian Kennedy is internationally recognized for his research in the basic biology of aging and is a visionary committed to translating research discoveries into new ways of delaying, detecting, preventing and treating age-related conditions. He leads a team of 23 principal investigators at the Buck Institute – all of whom are involved in interdisciplinary research aimed at extending healthspan, the healthy years of life.

The inventor on several patents, Dr. Kennedy is co-founder of two U.S. companies aimed at developing treatments for age-related chronic disease. He is actively involved in aging research in the Pacific Rim, which features the largest elderly population in the world. He is a visiting professor at the Aging Research Institute at Guangdong Medical College in China. In the past year he lectured in Korea, Russia, China, Chile, Austria, Italy and the United Kingdom. In conjunction with the University of Southern California, he also launched the nation's first PhD Program in the Biology of Aging.

Dr. Kennedy has published more than 130 manuscripts in prestigious journals including Science and Nature and has been quoted in The Wall Street Journal, The New York Times and The Boston Globe, among others. He is co-Editor-in Chief of Aging Cell and serves as a consultant for biotech and pharmaceutical companies. His own research has led to the discovery of Sirtuins and the mTOR pathway as key regulators of aging, with current studies involving an intensive focus that is unusual in the field – his work seeks to move discoveries from simple organisms into mammalian animal models as quickly as possible in order to develop new approaches to alleviate age-associated diseases in humans.

Interventions for Healthy Living

mTOR Pathway in Aging & Chronic Disease

Notes

Notes

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