This special NO-Age and NO-AD Seminar is to celebrate our NO-Age advisor Prof. George M. Martin on his 60+ Year Journey in the Gerosciences

Featuring Prof. George Martin
and his old friend Prof. Gary Ruvkun

Prof. George M. Martin
University of Washington
NO-Age Advisory Board Member
Photo: U of Washington

`` It is time we have come together to objectively discuss the pros and cons of these various underlying theories of WHY we age, as well as HOW we age, ´´ says Prof. George Martin

A recent interview of NO-Age to Prof. Martin
https://noage100.com/2019/11/08/no-age-interviews-prof-george-m-martin/

U. of Oslo | U. of Copenhagen | Chinese U. of Hong Kong | Norwegian U. of Science and Technology | K.G. Jebsen Centre for Alzheimer's Disease | Kavli Institute for Systems Neuroscience | NO-Age | NO-AD

The NO-Age and NO-AD Seminar Series 020

20:00-23:00 (CET), Monday, 6th Dec. 2021

(starting time: 8 pm Norway, 2 pm Boston, 11 am Los Angeles)

20:00-21:20 (CET):'Variegated Gene Expression as a Fundamental Mechanism of Aging and Geriatric Pathologies' *by* **Prof. George M. Martin**, University of Washington, Seattle, USA

21:30-22:50 (CET):'*C. elegans* surveillance of conserved cellular components in regulation of aging and pathogen defense' by **Prof. Gary Ruvkun**, Harvard Medical School, USA

Register in advance for this webinar:
https://uio.zoom.us/webinar/register/WN_OwcTx7WVQfWL3WxWRqPO8Q

Organizers:
Evandro F. Fang (UiO), Jon Storm-Mathisen (UiO), Menno P. Witter (NTNU),
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Previous recorded talks are available here: https://noad100.com/videos-previous-events/

Name: Prof. George M. Martin, MD
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Speaker: Professor George M. Martin

Title: Highlights of a 60+ Year Journey in the Gerosciences and Variegated Gene Expression as a Fundamental Mechanism of Aging and Geriatric Pathologies

Abstract:

My journey started as a pathologist who was struck by the marked variability of patterns of disease seen in geriatric autopsies. This led to genetic approaches to aging research, starting with the search for the mutations responsible for the Werner Syndrome and other Segmental Progeroid Syndromes and the discovery that virtually all resulted in genomic instability. I then founded one of the first US Alzheimer's Disease Research Centers, leading to the mapping of two early onset forms caused by dominant mutations (PS1 & PS2) and the cloning of PS2. My lab is currently testing the hypothesis that age-related increases in variegated gene expressions can be considered as the newest member of the Hallmarks of Aging. Our most recent publication (PMID: 31957802) describes initial research documenting roles for specific human genetic loci to either greatly increase or decrease VGE in an initial test locus of relevance to aging, Sirt1.

Biography:

Professor of Pathology Emeritus (Active); Director Emeritus, Alzheimer's Disease Research Center; Adjunct Professor of Genome Sciences (Retired), University of Washington ; Visiting Scholar, Molecular Biology Institute, UCLA. Dr. Martin received his BS and MD degrees from the University of Washington and has been a member of its faculty since 1957. After an internship at the Montreal General Hospital and a residency in anatomic pathology at the University of Chicago, he pursued postdoctoral research in somatic cell genetics under Professor Guido Pontecorvo at Glasgow University, where he worked with Aspergillus nidulans and human cell cultures. Other postdoctoral experiences have included research in molecular biology with Francois Gros in Paris and in experimental embryology with Henry Harris and Richard Gardner at Oxford University. He has also done medical genetics fieldwork in India. Honors for his research have included the Brookdale, Kleemeier and Paul Glenn Foundation awards of the Gerontological Society of America, the Allied-Signal Corporation Award, the Irving Wright Award of the American Federation for Aging Research, the American Aging Association Research Medal and Distinguished Scientist Award, the Pruzanski Award of the American College of Medical Genetics, and a World Alzheimer Congress Lifetime Achievement Award. He has also received an Outstanding Alumnus Award from the University of Washington School of Medicine. He was elected to the Institute of Medicine of the National Academy of Sciences and now serves as a Senior Member. Dr. Martin was a member of the National Advisory Council, the Board of Scientific Counselors of the National Institute on Aging, and the Scientific Advisory Board of the Ellison Medical Foundation. He currently serves as the Scientific Director of the American Federation for Aging Research. He was the Founding Editor-in-Chief of an AAAS/Science WEB site for research on the biology of aging (SAGE KE). Dr. Martin is a Past President of the Tissue Culture Society of America, Scientific Director Emeritus of the American Federation for Aging Research, and the Gerontological Society of America.

Dr. Martin's research has for many years been concerned with the development of genetic approaches to the study of aging and age-related diseases in mammals. One theme has been the plasticity of the genome of somatic cells. His lab has contributed to our understanding of a number of mechanisms for the heritable alteration of genetic information (Nature, 1967; Science , 1969). During this period a parallel series of biochemical, cytogenetic and somatic cell genetic studies on cells from aging mammals addressed various somatic mutational theories of aging; these have demonstrated the importance of relatively large scale chromosomal types of mutation. An offshoot of this work provided the first data on mutation frequencies in human epithelial cells in aging human subjects (Human Mol Genet, 1996).

These studies were reinforced by a long series of investigations of a remarkable human progeroid syndrome, the Werner syndrome, a recessive mutation that Dr. Martin's group and Japanese investigators mapped to chromosome 8. This led to the positional cloning of the Werner syndrome gene and its identification as a member of the RecQ helicase family (Science, 1996). Dr. Martin and colleagues have provided molecular evidence for the importance of intragenic deletions in the somatic cells of Werner syndrome subjects (Proc Natl Acad Sci USA, 1989). Cells from these patients were also shown to undergo accelerated "aging in vitro" (Lab Invest, 1970). This latter line of research provided the first evidence for the limited replicative potential of cells of the vascular wall (Exp Mol Path, 1973). Together with Drs. Tom Norwood and William Pendergrass, the Martin lab also carried out the first cell fusion experiments for the investigation of dominance/recessivity relationships between old cells, young cells and "immortal" cells (Proc Natl Acad Sci USA, 1974; J Cell Biol, 1975) and demonstrated that the decline of growth potential involved gradual and variable attenuations of clonal growth (Am J Path, 1974).

Later in his career, Dr. Martin turned his attention to mechanisms of the aging of post-replicative cells, again using genetic approaches. He assembled a team of investigators to carry out a linkage analysis of familial Alzheimer disease, an effort that led to the assignment of the commonest form to chromosome 14 (Science, 1992) and to the mapping and positional cloning of a related locus on chromosome 1 (Science, 1995). New candidate genes were sought using the yeast protein interaction trap methodology. This work has led to a series of papers on an adaptor protein (FE65) that is of importance in the modulation of the function of the beta amyloid precursor protein; polymorphisms at that locus were shown to play a role in the susceptibility to AD in very old individuals.

Dr. Martin is certified by the American Board of Medical Genetics (Clinical Cytogenetics) and the American Board of Pathology. His major teaching contributions at the University of Washington have involved the founding directorships of the Medical Scientist Training Program and the "Genetic Approaches to Aging Research" Institutional Training Grant of the National Institute on Aging. He continues to serve on the Executive Committee of that program and the Nathan Shock Center of Excellence for Basic Research on the Biology of Aging, both of which are under the directorship of his former graduate student, Prof. Peter S. Rabinovitch.

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Image: Harvard

Speaker: Gary Ruvkun

Title: *C. elegans* surveillance of conserved cellular components in regulation of aging and pathogen defense

Abstract:
To be updated

Biography:

Gary Ruvkun Laboratory

The Ruvkun lab uses C. elegans molecular genetics and genomics to study miRNA and RNAi pathways. Using genetic and RNA interference approaches, we have identified many genes that positively or negatively regulate RNAi and microRNA pathways. These genes reveal the trajectory of siRNAs and miRNAs as they target mRNAs, as well as components that may be developed as drug targets to enhance RNAi in mammals.

Over the past decade, we discovered that like mammals, C. elegans uses an insulin signaling pathway to control its metabolism and longevity. This analysis has revealed striking congruence of molecular mechanisms at many steps in the pathway, suggesting that insulin regulation of longevity and metabolism is ancient and universal. The new genes of the insulin pathway that have emerged from these studies are conserved in animal phylogeny and represent new targets for diabetes drug development.

Functional genomic analyses using RNAi libraries of every C. elegans gene now allows a systematic study of metabolism and aging. Our lab has surveyed 18,000 genes for their action in regulation of longevity, fat deposition, RNAi, miRNA regulation, and molting. This analysis gives a global view of the molecular machines that operate in these pathways. Current research in the Ruvkun lab attempts to weave these lists of aging regulatory genes into pathways that assess and regulate metabolic tempo and mode, repair and regeneration, and protective and degenerative pathways. A neuroendocrinology of energy balance and longevity will emerge from these studies.

We are developing protocols and instruments that use PCR primers corresponding to universal sequence elements of the 16S RNA gene to search for diverse microbes that may cause diseases unsuspected to be due to pathogens and microbes from extreme environments. One long term goal of this project is to send a robotic thermal cycler with these primers to Mars in search of microbial life that is ancestrally related to life on Earth.