Program: **Live & Zoom: The Genetics of Aging and How to Live Longer**
Speaker: Glenn J. Bingle, MD, PhD, MACP, Medical Director, Genetic Services & Counseling, Community Hospital of Indianapolis
Introduced by: Hank Wolfla
Attendance: NESC 62, Zoom 52
Guests: Linda Karwisch, Sally Endo, Art Sterne, Leon Mencias, Brigid Castro
Scribe: Glenn Bingle
Editor: Bonnie Carter

A recording of today's Zoom presentation may be viewed at: www.scientechclub.org/zoom/450.mp4

Dr. Bingle did a self-introduction noting he was a 3-year member of Scientech Club and a six- time presenter to the Club. He commented that this was the most difficult lecture he had given as this is not his area of expertise. He is one of the very few 78-year-old members of the Club working part-time in the field of clinical cancer genetics where he is Medical Director of the Center for Genetic Health at the Community Health Network, a six-hospital system in greater Indianapolis.

He made his second disclaimer that he has no financial interest or potential gain from any of the drugs, chemicals or nutrients mentioned in the talk. He thanked Hank Wolfla who helped with the complex audio-video parts and Dr. Charlie Morris, club member now residing in Florida, for help with the very important psycho-social aspects of aging.

He told the story of how he developed a keen interest in the subject matter. He said the objectives of the lecture are provoking the audience to contemplate the answers to profound questions about aging: #1: Can we prevent aging? #2: Is aging a separate independent disease from the big four most commonly associated aging diseases: cardiovascular, cancer, neurodegenerative and infectious. COVID19 continues to teach us about the importance of infectious diseases and end of life for the aged.

Lifespan by David Sinclair, PhD, and Matt LaPlante is one of the very few books on the genomics of aging and the only book on the subject he has read. It was a gift from his son Mike Bingle. The text is a masterpiece of marketing of a human genetic health book. The book's twenty five testimonials cite phrases like brilliant scientific work; poised to change what we think about aging; transcends everything we know about aging; most visionary book about aging he (Ed. the testimonial giver) has read. After reading the book and reviewing some literature, Dr. Bingle mentioned areas of disagreement and concerns about potential areas of conflict of interest.

Dr. Bingle next showed a video summarizing his thoughts about pioneers who had claimed to find and drink from the fountain of youth. In reviewing the greater than 300 theories of aging he presented eight slides depicting life spans of species from a few minutes to immortality. He remarked that any decent theory of aging must account for this nearly infinite yet spectacular variability in life span.

Scientists who study aging believe that most theories before the 1990s were flawed. He presented the rationale in slide #18. Depending on how aging is defined, no one factor can solely explain the variability in life span of organisms inhabiting the planet. Each

theory looks at aging through the lens of a single cell, multiple cells which may be at issue, a bigger organ, or the entire organism as a system. The best fit models will account for the environment at each level and the interaction of the environment with the genomics of the organism. The question of nature or nurture, environment or genomics is quite evident. Can these be separated? Can the dancer be separated from the dance?

Slide #19 presents the major molecular drivers of aging. Slide #20 reviews the fallacy of the telomere aging clock. Slide #21 reviews Dr. David Sinclair's major theory of aging. Slide #22 presents six rare genetic syndromes that greatly accelerate the human aging process with comments of treatment and genetic engineering. In slide #26 Dr. Bingle discussed the APOE gene and its importance in aging. He discussed the evolution of the survival genes thought to slow aging by turning on the survival pathways and turning off reproductive pathways, and the mad search for chemical and or drugs to turn them on or block them.

There are four major survival pathways in almost all complex organisms: turning on the seven SIRT genes, boosting the level of NAD which falls dramatically with aging, inhibiting the mTOR pathway, and revving up the AMPK pathway. He discussed the discovery and problems with the search for chemicals, foods, and drugs that do that for the four major survival pathways.

The end of the talk summarized what to Dr. Bingle is most important, far more than genomics of aging, the psycho-social aspects of aging. He ended with the Westernized version of what the Japanese call *Ikiga*i and the very important psycho-social aspects of aging.