

Interview with Daniel Perry

Biomarkers

KYLE JENSEN: Welcome to SAGE Crossroads, the premier online forum in issues of human aging. These podcasts feature lively discussion with the experts on the ethical, political, economic, scientific, and societal implications of aging related science. Thank you for listening.

I'm speaking now with Daniel Perry. Mr. Perry is the executive director of the Alliance for Aging Research.

Mr. Perry, what is a biomarker of aging? How is it different from a chronological marker of aging?

DANIEL PERRY: Well, a biomarker is a way to measure a parameter in a biological system or subject. All of us have in our minds how old we are. We use it as we use a clock to count the passage of time. Over a human life, we measure the passage as months, years, decades and so on, but for medical purposes, if we are going to try to develop interventions that modify the rate of aging in individuals, first we have to find a way to validate measuring aging separate from chronological age. We know that not all 50 year olds are the same. The same for all 60 years olds or 80 years olds or any other age. People vary despite their same chronological age, so we have to have measures that get at how old a person really is biologically and how to measure that, and that's how biomarkers come in.

KYLE JENSEN: How would a biomarker of aging impact research into aging-related diseases?

DANIEL PERRY: Well we have biomarkers for testing the efficacy of various interventions in individuals for different diseases of aging. Commonly known, we use cholesterol and blood pressure measures to determine cardiovascular health, and we have medicines and other interventions to lower cholesterol and lower blood pressure, and those are interventions that are effective against heart attack or stroke or other cardiovascular disease. We don't have those agreed upon measures in aging. In fact there have been some efforts to try to develop biomarkers of aging in mice and other laboratory animals, but we don't have a scientific consensus on what we would measure in human beings that would possibly give us that same target to shoot at with interventional medicine. I say there have been efforts to try to do this but we don't have it yet in humans.

KYLE JENSEN: What needs to be done in the search for biomarkers of aging?

DANIEL PERRY: First of all, we need to recognize that there's not going to be any single measurement that will allow us to measure the rate of aging or biological age in an individual, but there have been literally hundreds of papers published pointing to various rates of changes that take place in humans over time. Everything from increased rates of

inflammation, difference in hormone levels, measurement of chemicals, respiratory capacity, and bone density...the list goes on and on. What we need is a well organized research effort to take these various proposed measures on biomarkers of aging and put them to the test to get them validated to narrow the field down to just a few where there is agreement that certain measures taken together as a measurable battery would produce a quotient agreed upon as a person's biological age, and we could measure it over time. Most importantly, we could measure how that biological rate of change in the biological rate of aging might be slowed or retarded by some other intervention.

KYLE JENSEN: Given your understanding of the state of aging research, when do you predict that researchers will begin to make headway into the discovery of biomarkers?

DANIEL PERRY: Well it depends on how quickly we get back on that horse and try to drive toward a consensus. There was a large effort by the National Institute on Aging in the early 1990s. When it did not succeed in producing a set of measures that could become the biomarkers of aging, many in the field became discouraged. I would argue that the tools that were available in the 1990s and the approach may not be as ideal as what we could put together today when we have massive throughput screening and many sophisticated gene arrays and so forth to begin to get consensus around a handful of measures, and perhaps to validate them against what we know hundreds of thousands of Americans who have been sampled in various clinical trials and for whom we have various ways to measure their performance.

KYLE JENSEN: The audience of SAGE Crossroads is made up of scientists, policy makers, and curious consumers. If there is one last statement that you could make to them about biomarkers of aging, what would it be?

DANIEL PERRY: That until we have established the framed work by which we will evaluate scientifically if an intervention in aging is true or whether it is anecdotal, the field of aging research will be held back. We need to create through research a means of measuring changes in the rate of biological changing or else it will be the single most rate limiting factor in our progress toward slowing aging in a way to extend healthy years of life.

KYLE JENSEN: Thank you. On behalf of SAGE Crossroads, I'm Kyle Jensen.