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It is quite possible to slow aging and extend life span

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Prof Kennedy has been contributing to the development of research in ageing in Singapore.



Aging is inevitable, but there are steps that can be taken to grow older while maintaining your health and healthy outlook. Recently, Prof Brian K. Kennedy, an internationally renowned expert has been appointed to lead ongoing efforts at the National University of Singapore (NUS) to understand the human ageing process and how to extend the period of healthy life or health span. Prof Kennedy was the President and CEO of the Buck Institute for Research on Aging in California from 2010 to 2016. Since 2016, he has been contributing to the development of research in ageing in Singapore. During his interview with *BioSpectrum Asia*, Prof Kennedy spoke on various aspects of human ageing process and how he feels that Singapore is the right place for such clinical interventions. Here are the excerpts from the interview-

Q. What are the major old-age related diseases that are the biggest concern for the Singaporean / SE Asian population?

Ans. The chronic diseases of aging are similar in Singapore population and other places. However, there are some slight differences; for e.g., there are major concerns in Singapore around diabetes as compared to US. Also, the causes of diabetes in the aging population is somewhat different in Singapore as compared to western population. However, dementia and cardiovascular diseases still remain among the main causes of mortality.

Q. Are there any lifestyle changes that people can make, to reverse or slow down such aging related degeneration?

Ans. Now-a-days, people have a general understanding of what is crucial for healthy aging. There are 4 main areas that an average person should focus on; healthy diet (most evidence suggest that this involves food comprised of high fruits and vegetables, low animal protein, low levels of processed food, and relatively low dairy levels); exercise (cardiovascular and resistance exercises); quality of sleep and stress-management. The goal is to live a healthy living and it could be achieved through mindful and sustained lifestyle changes.

Q. Is it medically even possible to reverse / slow / stop the aging process? How close to reality is medical science in achieving such a miracle?

Ans. Through animal models and some early studies in humans, we now know that slowing the process of aging is possible. In mouse, we have been successful in extending life span and health span by about 30%. If humans could do some changes in their lifestyles, it would add 20 years of their healthy life. With the interventions we know, it is quite possible to slow aging and extend life span but we cannot totally stop it. I think, reversing the aging process is still an open question that requires more research.

Q. Please tell something about Sirtuins?

Sirtuins are a class of proteins called deacetylases that modify other proteins and regulate their activity. Sirtuins have been implicated in influencing a wide range of cellular processes including ageing. Research shows that by increasing the activity of multiple sirtuins, health and life span of mice can be increased. Sirtuins can also be activated by small molecules (the best known is resveratrol- found in grape skin and other fruits). This is a very ground-breaking pathway with respect to aging, and is certainly a place to test interventions.

Q. Contrasting your experience between US and Singapore / SE Asia, is the profile and incidence of age related medical issues similar or different? What are these?

Ans. It is interesting to understand the difference in the causes that lead to diabetes in both US and Singaporean population. Again, there are similarities, but the differences are fascinating. Unlike in US, where the primary reason of diabetes is obesity, it is really intriguing to comprehend the rise of the disease in relatively thin Singaporean population. Since metabolic function is closely linked to ageing as well as diabetes, increased understanding will also tell us something important about ageing.

Q. Talking about research, what are the most trending focus areas in the universities and geographies that you have been associated with?

Ans. I have been doing research on aging for around 25 years now. The ageing phenomenon is not unique to Singapore. Since China is also facing similar aging population issue, I have been involved in interactions with scientists and government officials in that country. One-child policy, topped with rapidly increasing percentage of the older population, is changing demographics in the world. Japan and Europe also have a lot of focus on ageing issues. Right now, everyone is searching for answers about how to keep elders more active and engaged. In terms of medical research, The Buck Institute for Research on Aging in California, where I was CEO for several years, is highly focussed on basic aging, while other institutions specialise in gerontology and geriatrics. Here, we are trying to create an all-in-one centre that aims at extending health span of Singaporean population and I strongly believe that Singapore's progressive mind-set embodied by the government and the NUHS can help us facilitate this approach.

Q. If I understand correctly, we probably see four broad categories that can be associated with old age - neurological diseases (like Alzheimer and Parkinson), orthopaedic problems (like osteoporosis and arthritis), tendency for a late onset of cancer (like multiple myeloma or pancreatic, etc.) or a result of sedentary lifestyle that manifests only in later age (cardio related, strokes, etc.). Are the underlying reasons and contributing factors for these very different, or is there any correlation and inter-dependence around which segment of the population is more likely to get them?

Ans. There are others too, beyond these four categories. Our research in this field has led us to believe that these causative factors are inter-related. Studies on the drug metformin illustrate this point; it was established as a diabetes drug till very recently when various lines of evidence suggest that it protects against neurologic diseases and cardiovascular diseases. By targeting these aging pathways, we might be able to get multiple protection against different kinds of diseases. This is really exciting if we can prevent multiple diseases simultaneously and possibly also treat patients with age-related chronic diseases.

Q. Generally speaking, how different is the incidence of various old age diseases - based on race or ethnicity?

Ans. Understanding the differences in health and addressing disparities are critically important to improving overall health and well-being of any nation. Unfortunately, we still have to uncover and comprehend many of these differences. In the US, certain age-related diseases are more prominent in African-American population as compared to Caucasian population, for example. In other cases, the Hispanic population is protected against a particular age-related disease compared to the Caucasian population. In many cases, we are unaware of the underlying cause- genetic or lifestyle. There have been significant studies done with the Han Chinese population, but there is still a lot to learn about aging in the Malay and Indian population. Singapore resides both these ethnic groups and it will be interesting to understand and implement different strategies for these populations based on the knowledge that is acquired.

Q. What is the role of government and policy that you see in adapting some of the outcomes of university research?

Ans. Close connection between the government and academic research is critical. A lot also depends on how the healthcare system is setup in a country. A nation who covers the healthcare costs for its residents, will be interested in effective preventive strategies, as it ensures general health, increases productivity, and delays/prevents expensive diseases. Singapore is a very progressive country and it is well-poised to target ageing.

Q. From a demographic perspective, when one considers countries like Japan for instance - which are an aging population, do you see that an aging population has socio-economic implications with respect to the cost of welfare for a ballooning retiring population that has to be supported?

Ans. Yes, there are huge socio-economic implications in all aging populations across the globe. The general issues are the same - a high frequency of elders often with one or more chronic diseases, low birth rate leading to reduced people of working age, insufficient social and healthcare programs to manage aging. There are also variables between countries. It is also worth noting that while Japan does have the highest percentage of seniors, other countries, like Singapore, are right behind and this is a global issue. From a medical perspective, the challenge is to keep people healthy as long as possible, not just make them live longer. We believe this can be achieved through aging research. We need to stop thinking of older people as a burden and see the obvious opportunity: if we can keep people healthy, active and engaged as they get older, society will derive great benefit for their accumulated experience and wisdom. An ageing population is ultimately a great opportunity for positive social change.