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TEMASEK LIFESCIENCES LABORATORY

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The Auditorium (Level 1)

Hosted by: Dr Ong Chin Tong

The Age of Ageing – Can we Intervene?



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Dr. Brian Kennedy is internationally recognized for his research in the basic biology of aging and as a visionary committed to translating research discoveries into new ways of delaying, detecting, and preventing human aging and associated diseases. He is the Director of National University Health System (NUHS) Centre for Healthy Ageing. He also serves as a Distinguished Professor in Department of Biochemistry and Physiology at Yong Loo Lin School of Medicine, National University Singapore (NUS). From 2010 to 2016 he was the President and CEO of the Buck Institute for Research on Aging in California. He remains a professor at the Buck Institute.

There is a growing sense that a holistic understanding of ageing biology may be achievable. This would represent a tremendous advance in our collective biological understanding and afford opportunities for novel interventions to enhance human healthspan. Ageing is the biggest risk factor for the major chronic diseases growing in prominence. These include cardiovascular and neurodegenerative diseases, diabetes and cancer. If ageing can be slowed, the effect would be simultaneous protection from many of the chronic diseases. One strategy is to use animal model organisms to find common pathways that modulate ageing and then to seek methods for their manipulation in humans. The TOR pathway is one point of convergence and a clinically approved drug targeting the TOR kinase, rapamycin, extends murine lifespan and healthspan. Many more small molecules are being added to the list of anti-ageing compounds. Here, I will summarize the ageing field and use examples to conceptualize how agents extending healthspan might be developed to improve human health. We are now entering a stage in the development of this research field where it is imperative to test ageing interventions in humans. The potential to directly impact human healthspan is emerging from ageing research and this approach, if successful, will dramatically impact medical care in this century, which is characterized by a rapidly ageing global population.

Recent Publications:

1. Haller, S., Kapuria, S., Riley, R., O'Leary, M.N., Schreiber, K.H., Andersen, J.K., Melov, S., Que, J., Rando, T.A., Rock, J., **Kennedy, B.K.**, Rodgers, J.T. and Jasper, H. 2017. Age-related somatic stem cell loss is a consequence of transient mTORC1 activation during regenerative episodes. *Cell Stem Cell*, 21: 806-818. PMID 29220665.
2. Liao, C.-Y., Anderson, S.S., Chicoine, N.H., Mayfield, J.R., Academia, E.C., Wilson, J.A., Pongkietisak, C., Thompson, M.A., Lagmay, E.P., Miller D.M., Hsu, Y.-M. McCormick, M.A., O'Leary, M.N., and **Kennedy, B.K.** 2016. Rapamycin reverses metabolic deficits in lamin A/C-deficient mice. *Cell Rep.* 17: 2542-2552. PMID: 27926859.
3. Tsai, S., Rodriguez, A.A., Dastidar, S.G., Del Greco, E., Carr, K.L., Sitzmann, J.M., Academia, E.C., Viray, C.M., Martinez, L.L., Kaplowitz, B.S., Ashe, T.D., La Spada, A., and **Kennedy, B.K.** 2016. Increased 4E-BP1 expression protects against diet-induced obesity and insulin resistance in male mice. *Cell Rep.* 16: 1903-1914. PMID: 27498874.