Department of Biomedical Engineering
Graduate Seminar

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**Subject: Defining cell-based biomarkers of ageing**

## Abstract:

The process of ageing is inevitable, and while we gain one chronological year with the passing of each birthday, the biological outlook among individuals is variable. A growing body of evidence shows that the interactions of intrinsic and extrinsic factors, i.e. molecular states (e.g. epigenomic) together with environmental factors and macroscopic stressors (e.g. social determinants, disparities) contribute to the rates of ageing in individuals. However, it is unclear how the underlying molecular states of an individual relate to their clinical ageing outlook. We postulate that studying age-associated changes at the intermediate length scale of cells–between the larger length scale of organs and tissues and the smaller length scales of molecules–may provide a key link to understand the inter-relation among ageing scales. Populations of cells display dynamic and heterogeneous phenotypes in the context of health and disease. As integrators of molecular signals, cells offer a sensitive meso-scale view of ageing, with cellular dysfunctions likely occurring prior to the manifestation of age-related diseases at the clinical level. This suggests that essential ageing information may be encoded within cellular properties. In my seminar I will present data that seeks to answer three key questions, 1) is ageing information encoded within biophysical properties of cells? and 2) can cellular properties determine the cellular biological age of healthy individuals, and 3) how is this ageing information encoded by/within cells?

## Bio:

Dr. Jude M. Phillip is an Assistant Professor of Biomedical Engineering, with a secondary appointment in Chemical & Biomolecular Engineering and is a Core Researcher in the Institute for Nanobiotechnology (INBT) at Johns Hopkins University. His lab studies biological ageing dynamics in the context of health and disease. He combines fundamental engineering approaches with translational ageing and oncology research to develop strategies and technologies to probe ageing and identify mechanisms to modify ageing trajectories to drive heathy ageing.

**Date and time: Friday April 16th , 2021**
**WebEx Link:** https://njit.webex.com/njit/j.php?MTID=meedaee444a7e72ebdb023ead6b7d9d44