**Research Theme:** Molecular and Cell Biology  

**Research Project Title:** Cellular aging regulation by cytoskeleton and phase separation  

**Principal Investigator/Supervisor:** Yansong Miao  

**Co-supervisor/ Collaborator(s) (if any):**  

### Project Description

**a) Background:**

Cellular damages are the leading cause of aging, including protein damage, protein aggregation, and reactive oxygen species (ROS)-caused DNA and mitochondrial dysfunction. The greatest risk factor for almost all neurodegenerative diseases, such as Alzheimer's disease, Parkinson's disease, Huntington's disease, is aging. These neurodegenerative diseases have common cellular and molecular mechanisms, protein aggregation. However, the molecular mechanisms on how these aggregation form and cause aging are still mostly unclear. Budding yeast, a single-cell eukaryote, has been a powerful model system and as well the driving force for understanding aging mechanisms because it is exceptionally genetically tractable. Multidisciplinary research will be the crucial element of this work, including advanced cell imaging, biochemistry, structural biology, and biophysics. As the EMBO affiliated lab, the successful candidate will receive rigorous training in these areas and have opportunities to learn top-notch biological systems from EMBO or EMBL workshops/courses.

**b) Proposed work:**

The proposed project aims to study molecular mechanisms on the formation of protein aggregates and the cause of aging process. This PhD project will combine bioengineering, cell biological, biochemical, genetic and optogenetic approaches. Advanced cell biology imaging will be widely used, such as super resolution microscope. Results of the proposed research will provide important insights to understand how intracellular activities regulate the aging process.

### Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator: yansongm@ntu.edu.sg

### SBS contact and how to apply:

Associate Chair-Biological Sciences (Graduate Studies) : AC-SBS-GS@ntu.edu.sg  

Please apply at the following:  
http://admissions.ntu.edu.sg/graduate/R-Programs/R-WhenYouApply/Pages/R-ApplyOnline.aspx