NANYANG TECHNOLOGICAL UNIVERSITY

School of Biological Sciences

Reg. No. 200604393R

Research Theme: Computational biology

Research Project Title: Investigating the protein phase behavior in polarized fungal growth by coarse-grained molecular simulation

Principal Investigator/Supervisor: Lu Lanyuan

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

Project Description

a) Background:

By using molecular simulation and experimental validation, we will investigate the phase behaviors of a number of proteins and protein mixtures that are involved in the actin assembly process of yeast. The computational results will enhance our understanding of the various molecular interactions in the studied biological systems. In particular, based on the structural and dynamic information generated by computer, we will discover the molecular mechanisms and answer the two questions from the biophysical aspect: a) How the experimentally known proteins, mostly belonging to intrinsic disordered proteins (IDPs) manage to change local concentrations and exhibit some unique phase behaviors? b) What are the molecular origins of the sequence-dependent and other factor related experimental phenomena on the phase behaviors of the proteins and protein mixtures?

b) Proposed work:

The student for the project will conduct the computational work, while close collaboration with an experimental lab (Asst Prof. Miao Yansong) is expected. Computer simulations will be conducted to study various protein complexes containing IDPs and folded proteins, elucidating key molecular interactions in protein phase separations. The computational results in the project will be used to guide future experimental work.

Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator: Lu Lanyuan lylu@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

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