NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

School of Biological Sciences
College of Science

Reg. No. 200604393R

Research Theme: Structural biology and cell biology

PhD Research Project Title: How to build a cilium

Scholarship category (Please indicate the source of funding for this project):

SBS Research Student Scholarship (for SBS faculty only)

Principal Investigator/Supervisor: Sam Li

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

Project Description

a) Background: Cilium as an organelle is ubiquitous in a wide range of cell types, from the embryonic cells to highly differentiated photoreceptor cells in retina. The cilia have diverse biological functions. Each cilium is composed of hundreds of different proteins. How these proteins come together in a spatiotemporal controlled manner to build a functional cilium is not unclear.

b) Proposed work: By using an integral biophysical and cell biology approaches, the project aims to elucidate the molecular mechanism of cilium assembly process. Specifically, electron cryo-tomography, along with AI-assisted protein structure prediction method, will be applied to obtain high-resolution structure of cilium. Structure-guided mutagenesis and cell biology study of individual protein or complex will reveal their functions. Together, the finding will help to understand the organelle's assembly process, which causes human diseases when mis-regulated.

c) Preferred skills: basic knowledge in mathematics, physics and biology. Computation work on image analysis or cell biology skill would be a big plus, but not necessary.

Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator: sam.li@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:

Application portal:

https://venus.wis.ntu.edu.sg/GOAL/OnlineApplicationModule/frmOnlineApplication.ASPX