



Research Theme: Cell and Structural Biology
Research Project Title: Functional and structural characterisation of a novel cell junction-associated Rho-type GTPase regulator
Principal Investigator/Supervisor: A/Prof Alexander Ludwig
Co-supervisor/ Collaborator(s) (if any): NA
Project Description a) Background: Rho-type GTPases (Rho, Rac, cdc42) are important molecular switches that control a range of biological processes and are regularly deregulated in cancers. We have recently identified a novel GTPase regulator that is localized to epithelial cell junctions and interacts with components of the actin cytoskeleton. We hypothesise that this protein is involved in the development of epithelial cell polarity and morphogenesis, cell migration, and/or in controlling epithelial cell plasticity. b) Proposed work: The goal of this PhD project is to study the cellular function of this protein and to produce mechanistic insight into how the protein operates. Protein function will be studied in cultured epithelial cells using RNAi and CRISPR/Cas9 technology, 2D and 3D cell culture models, functional assays, and high-resolution imaging (light and electron microscopy, 3D tomography, and correlative imaging). To produce mechanistic insight into protein function, we will express and purify the protein and its binding partners and analyse such interactions <i>in vitro</i> using a range of biochemical, biophysical and structural methods (mass spectrometry, ITC, SPR, NMR, Xray crystallography and cryoEM).
Supervisor contact: If you have questions regarding this project, please email the Principal Investigator: aludwig@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