

Research Theme: Structural biology
PhD Research Project Title: Structural features and potential for inhibition of channel activity in coronavirus envelope proteins
Principal Investigator/Supervisor: Jaume Torres
Co-supervisor: Konstantin Pervushin
Project Description
<p>a) Background: Severe acute respiratory syndrome 2 coronavirus (SARS-2-CoV) is responsible for the COVID-19 pandemic. Its envelope (E) protein is almost identical to that in the SARS coronavirus responsible for the 2003 pandemic, which is critical for pathogenesis and forms cation-selective channels. A single mutation in E protein rendered the virus non-lethal, suggesting an avenue for treating COVID19 and other coronavirus-induced diseases. High resolution structures of this channel are very scarce, therefore new strategies must be developed for its study by both NMR and Cryo-EM. The templates developed will also be useful for E-channels in SARS, Middle East respiratory syndrome (MERS) or avian infectious bronchitis virus (IBV), and also against channels found in other pathogenic viruses.</p> <p>b) Proposed work: expression and purification and characterization of coronavirus envelope proteins; structural study in detergent or lipid membranes by NMR (solution or solid state) or electron microscopy; drug-protein interactions; biophysical assays</p> <p>c) Preferred skills: experience in cloning and mutagenesis, purification of peptides or proteins (especially membrane proteins), any experience in general biophysics instrumentation, e.g., electrophoresis, UV-Vis, CD, DLS, Stargazer, SPR, ITC, NMR, etc</p>
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<p>If you have questions regarding this project, please email the Principal Investigator: {jtorres@ntu.edu.sg}</p>
SBS contact and how to apply:
<p>Associate Chair-Biological Sciences (Graduate Studies) : AC-SBS-GS@ntu.edu.sg Please apply at the following:</p> <p>Application portal: https://venus.wis.ntu.edu.sg/GOAL/OnlineApplicationModule/frmOnlineApplication.ASPX</p>