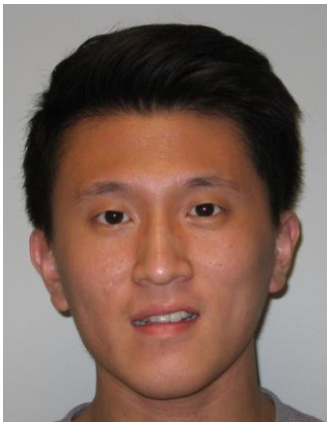
2019 Bigelow Book Prize Recipient



Frank Shin-Haw Lee, PhD Candidate
Department of Physiology
Faculty of Medicine
Supervisor: Dr. Anthony Gramolini

Heart failure remains the leading cause of inpatient hospitalization and mortality worldwide characterized by impaired ventricular function and reduced cardiac output. Although the etiology of heart failure varies, investigations into cardiac diseases have shown that the sarco(endo)plasmic reticulum (SR/ER) plays an important role in the development and progression of many human heart diseases, responsible for biochemical changes, structural remodeling, and deterioration of the muscle. The SR provides many critical functions in cells. However, many aspects of its structural organization remain largely unknown, particularly in cells with a highly differentiated SR network. Utilizing proteomics and detailed biochemical analyses of human and primary mouse cardiomyocytes as well as zebrafish models, I was able to identify a previously uncharacterized cardiac-enriched membrane protein, REEP5, and showed that it is centrally involved in regulating cardiac SR/ER formation and stress responses in cardiac myocytes. These findings provide significant insight into SR biology and physiology, revealing the previously unknown, and indispensable role of REEP5 in SR organization and heart function.