# PhD DEFENSE

TEMASEK LIFESCIENCES LABORATORY


## Ms Mu Baicong

*Dr. Zhang Dan Group*


**17 Dec 2024, Tues**

**2:30pm**

**The Auditorium**

*Scan for address

**All Are Welcome!**

## Regulatory mechanisms of the PM integrity and pH homeostasis at ER-PM contact sites during acute environmental change in *Schizosaccharomyces pombe*


Robust regulation of acute plasma membrane (PM) remodeling and cytosolic homeostasis is crucial for maintaining the structural and functional integrity of a cell. I utilized fission yeast to quantitatively monitor PM expansion in protoplasts under hypoosmotic shock, and cytosolic pH during energy depletion. Interestingly, protoplasts exhibited fast expansion triggered by mechanosensitive ion channel-mediated $Ca^{2+}$ influx upon hypoosmotic shock. We propose that lipid transfer protein-mediated non-vesicular lipid transfer at endoplasmic reticulum (ER)-PM contact sites maintain PM integrity during fast expansion in a $Ca^{2+}$-dependent manner. This timely process precedes bulk lipid delivery via exocytosis. We further expanded the function of ER-PM contact sites to pH homeostasis. The essential PM proton pump, Pma1, functions to maintain cytosolic pH. We identified a new mechanism for Pma1 regulation where VAP protein at ER-PM contact sites hijacks the Pma1 autoinhibition to facilitate pH homeostasis. My work highlights the roles of versatile ER-PM contact proteins in surviving environmental stress.