Stochastic Modeling of Yeast Cell Polarization: from Cell Budding to Population Development

Wing Cheong (Jon) Lo

Department of Mathematics, City University of Hong Kong, Hong Kong

Email: wingclo@cityu.edu.hk

Robust cell polarity is critical for cell survival and normal tissue development. Cell polarity is usually induced through the localization of specific molecules to a proper location of the cell membrane. Here we propose a model consisting the particle density of membrane bound molecules undergoing polarization to study the mechanisms for different budding patterns, including random budding pattern and axial budding pattern, in yeast cells. Also, we are developing a yeast cell population model to study how budding patterns are involved in cell population dynamics. Overall, our results provide a foundation to develop a multi-scale model for describing the collective behaviour of aging budding yeast cells.