1158-92-128 **Mikahl Banwarth-Kuhn*** (mbanwarth-kuhn@ucmerced.edu), **Jordan Collignon** and **Suzanne Sindi**. *Study of the Impact of Individual Cell Behaviors on Prion Protein Aggregation and Spatial Structuring of Yeast Colonies.* Preliminary report.

Prion proteins are most commonly associated with fatal neurodegenerative diseases in mammals, but they are also responsible for a number of harmless phenotypes in yeast. The diseased state (or phenotype) in yeast arises when a misfolded form of a protein, i.e. prion, appears and, rather than be removed by cellular quality control mechanisms, persists. In addition to gaining understanding the exact nature of the complex molecular processes and biochemical kinetics governing protein misfolding dynamics, connecting protein misfolding mechanisms *in vitro* to disease mechanism *in vivo* requires uncovering the non-intuitive relationships between protein aggregation mechanisms at multiple scales. We introduce a two-dimensional agent-based model of a budding yeast colony with detailed representation of cell-type specific biological processes. The model is used to study how individual cell behaviors drive the spatial structuring of yeast colonies and impact prion phenotypes. Spatial arrangement of cells is modeled using a center-based modeling approach and prion aggregation is modeled using simplified intracellular dynamics. The unified model may have the potential to predict mechanisms underlying spatial structuring of yeast and other microbial groups. (Received February 26, 2020)