1147-92-315 **Jakob Kotas*** (kotas@up.edu), University of Portland, Department of Mathematics, MSC60, 5000 N Willamette Blvd, Portland, OR 97203, and **Monique Chyba** (chyba@hawaii.edu), **Christopher Eblen** (christopher.eblen@colorado.edu) and **Yuliia Kravchenko** (yuliia@math.hawaii.edu). *A model for prion fibril growth based on oligomeric building blocks.* Preliminary report.

Prions are infectious agents comprised of misfolded protein material that result in a variety of neurodegenerative diseases in mammals called transmissible spongiform encephalopathies (TSEs). The pathogenicity of prions is due to their ability to template to form amyloid fibrils, aggregates in the brain which disrupt normal tissue function. A seminal mathematical model by Masel et al. has been used extensively to predict the growth of prion assemblies. At the heart of the Masel model is the assumption that monomers form the basis for fibril assembly. However, recent experimental evidence has challenged that assumption, finding that fibrils are formed from oligomeric building blocks. We have developed a new model to account for these findings. Our model is a coupled set of differential equations (dynamical system) describing the time-dependence of populations of prion assemblies of varying lengths. We investigate the dynamics of the system by finding equilibrium points. We then perform numerical simulations to show the growth of fibrils over time. (Received January 18, 2019)