1154-92-2410 **Yair Castillo**, **Nora Culik**, **Leah Darwin**, **Doménica Garzón** and **Abigail Hardin***, ahardin@ou.edu, and **Anji Yang**, **Gabriela Navas**, **Carlos Castillo-Garsow** and **Karen Ríos-Soto**. *Dynamics of Prion Proliferation Under Combined Treatment of Pharmacological Chaperones and Interferons.*

Diseases such as mad cow disease in bovines, chronic wasting disease in cervids, and Creutzfeldt-Jakob disease in humans are incurable illnesses caused by prions. Prion diseases are caused when the prion protein PrP^{C} misfolds into PrP^{Sc}, which is capable of inducing further misfolding in healthy PrP^{C} proteins. Recent *in vivo* experimental results have shown that pharmacological chaperone treatment can be used to prevent this conversion, where the pharmacological chaperones act as a short-term "vaccine" against the PrP^{Sc} proteins. A second strategic approach uses interferons to decrease the concentration of PrP^{Sc}. In this work, a non-linear system of ordinary differential equations is constructed to model how these two treatments slow the proliferation of prions in the brain. Through this work it was found that interferons have a greater effect on the prion population over time, but that the pharmacological chaperones begin to effect the system earlier. This information can guide future prion experiments and inform potential treatment protocols. (Received September 17, 2019)