999-92-244   **Meredith L. Greer*** (`mgreer@bates.edu`), 213 Hathorn Hall, Bates College, Lewiston, ME 04240, and **Laurent Pujo-Menjouet** and **Glenn Webb**. *A Mathematical Analysis of Prion Proliferation.*

Prions are the protein-only infectious agent thought to cause BSE and related spongiform encephalopathies. We present a system of two integro-differential equations which model replication of prions via nucleated polymerization. According to this theory of replication, infectious prion proteins exist as polymers which multiply by splitting, and lengthen by attaching and converting noninfectious protein. In this talk, we demonstrate that our equations are compatible with biology by checking balance and persistence. We next numerically illustrate the behavior of the infectious proteins. Last, we examine the steady states of the model, and provide stability results. (Received August 24, 2004)