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**Alex Chen\*** (achen@samsi.info), **Sam Lai**, **Scott McKinley**, **Peter Mucha** and **Greg Forest**. *Deterministic and Stochastic Modeling of Antibody Sequestration of Viral Populations in Mucosal Layers*.

We study the co-diffusion processes of viral and antibody populations through mucosal layers. Antibodies play an important part in immune defense by binding to the surface of virions and effectively neutralizing them. Less understood is the role of antibodies in arresting the movement of virions by means of their weak affinity for the mucin network, housed within mucosal layers.

Many previous studies on viral infectivity have focused on infection in cells and have assumed a well-mixed viral and antibody regime. Thus, antibody attachment kinetics is often discounted and the number of antibodies present in a viral attack is overestimated.

We introduce several models of virus and antibody co-diffusion based on a combination of PDE master equation and stochastic path simulation techniques. These models incorporate probabilistic antibody attachment kinetics as well as diffusion processes for movement. The relative advantages of each model for realistic simulation and computation speed are examined. Results of the study illustrate the importance of mucosal layers as buffer zones impeding the progress of virus toward vital tissue. (Received July 24, 2012)