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Stanca M. Ciupe* (msc6503@louisiana.edu), 433 Maxim Doucet Hall, Lafayette, LA 70508,
and **Patrick DeLeenheer** and **Thomas Kepler**. *Models of Antibody responses during HIV viral
infections.*

During the course of an individual's infection with Human Immunodeficiency Virus (HIV), the virus population consists of a distribution of different variants, produced by mutation and selection. Consequently, the immune system attempts to build a response that is broad enough to handle the diversity of virus strains present. Biological experiments have shown that neutralizing antibodies fail to offer long-term protection because they are primarily strain-specific and lag behind viral evolution. We develop mathematical models of antibody mediated immune responses against HIV with an emphasis on their neutralizing and non-neutralizing activity. Analysis of the model helps us predict which factors (host or virus specific) influence the outcome of the infection. In particular, we determine the roles of competition and cross-reactivity between families of neutralizing antibodies in the presence and absence of virus evolution and their impact on disease prognosis. (Received September 20, 2010)