1080-92-38 **Stanca M Ciupe*** (stanca@math.vt.edu) and **Sarah Hews**. *Mathematical models of immunological tolerance and immune activation following prenatal infection with hepatitis B virus.*

We develop mathematical models that study the role of hepatitis B e antigen in creating immunological tolerance following hepatitis B virus infection and propose explanations for the mechanisms that lead to hepatitis B e antigen clearance, subsequent emergence of potent cellular immune response and liver damage. The dynamics of virus-immune cells interactions are investigated and parameter regimes that allow for viral persistence are derived. Complexity is added to the model to account for mechanism responsible for hepatitis B e antigen loss including seroconversion and mutations in the virus leading to development of hepatitis B e antigen negative virus strains and subsequent activation of CD8 T cells that are specific for such virus. The connection between loss of hepatitis B e antigen and liver injury is investigated in each scenario and predictions about possible disease outcomes are proposed. (Received December 12, 2011)