1107-34-472 **Raquel Hontecillas**, **Monica Viladomiu**, **Vida Abedi**, **Casandra Philipson**, **Stefan Hoops** and **Josep Bassaganya-Riera*** (jbassaga@vt.edu), Blacksburg, VA 24060. *Computational modeling of mechanisms underlying immune responses to Helicobacter pylori.*

Modeling Immunity to Enteric Pathogens (MIEP) has developed the computational modeling infrastructure and experimental systems to generate computational hypotheses that guide validation immunology experiments. Multiscale modeling (MSM) allows simulating intra-cellular signaling pathways, molecular-cellular interaction networks, cell-cell interaction networks and host-pathogen interaction networks simultaneously. Enteric Immunity Simulator (ENISI) MSM was engineered to develop models at four scales of spatiotemporal magnitude: from microseconds for biochemical reactions, to hours for cellular phenotype change, and to days for induction of immune responses; and from nanometer for molecules, to micrometer for cells, and to millimeter for host-pathogen interactions. Through the development of novel computational models of immune responses to Helicobacter pylori and modeling tools MIEP greatly enhanced our understanding of the dual role of this bacterium as a commensal versus pathogenic organism and characterized the underlying immune responses. We are using MIEP's ENISI modeling platform to investigate cell-specific immune responses to H. pylori in the stomach that lead to chronicity of infection versus efficient eradication of the organism. (Received January 20, 2015)