1145-92-1919 **Sarah B Minucci*** (minuccisb@vcu.edu), **Rebecca L Heise**, **Michael S Valentine**, **Franck J Kamga Gninzeko** and **Angela M Reynolds**. *Understanding the Role of Macrophages in Lung Inflammation Through Mathematical Modeling.*

Mechanical ventilation is used to provide support to the lungs for patients with severe breathing issues, but as the air is pushed into the alveolar space it can trigger an immune response which leads to ventilator-induced lung injury (VILI). We develop a compartmental ordinary differential equations (ODEs) model of the immune response to VILI. This model is also the first to account for various states of the epithelial cells (healthy, damaged, and dead). We use dynamical system approaches and sampling of parameter space to analyze the VILI immune response and illustrate multiple outcomes corresponding to health and severe damage. (Received September 24, 2018)