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Patrick Gaskill*, 1015 Floyd Ave, Richmond, VA 23284, and **Rebecca Heise, Ramana
Pidaparti** and **Angela Reynolds**. *Agent-based modeling of strain-induced lung inflammation*.

Mechanical ventilation is needed in aged patients whose respiratory systems fail to achieve adequate gas exchange function. Despite its necessity, mechanical ventilation gives rise to strain in the lung tissue which then recruits an inflammatory response. In order to decrease ventilator-induced inflammation, we are developing an age-dependent multi-scale computational model. The initial state of model development is the creation of an agent-based model for strain-induced inflammatory response in lung tissue. We have implemented rules that govern the dynamics between lung tissue cells, bacteria, immune cells, and inflammatory mediators. We then computed the likelihood of various biological outcomes, e.g. infection, strain-induced inflammation, and health for different strain and infection scenarios. (Received September 25, 2012)