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Amber M Smith* (amber.smith@stjude.org). *Modeling Host-Pathogen Interactions During Influenza-Pneumococcal Coinfection.*

Influenza virus infections are often complicated by coinfection with bacterial pathogens like pneumococcus. Bacterial coinfections significantly increase influenza-associated morbidity and mortality. The host immune response plays a large role in driving bacterial establishment and the progression to pneumonia. However, how the host response is regulated and works to modulate pathogen growth is not well understood. To better characterize the regulatory mechanisms driving influenza-pneumococcal coinfection, we use an integrative analysis that combines data-driven mathematical models with model-driven experiments. Through this approach, we identified and detailed how virus-induced depletion of alveolar macrophages regulates bacterial invasion and leads to differential dynamics dependent on the time of bacterial acquisition. We also show how bacterial infection alters viral kinetics and the role of interferon in this process. Together, our models and data provide insight into the kinetics and mechanisms of coinfection and identify potential treatment strategies that abrogate the secondary infection. (Received September 02, 2016)