ABSTRACT

THESIS: The effects of simvastatin pretreatment on innate immune responses to *Staphylococcus aureus* infection

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Sepsis is a systemic inflammatory response that causes, increased heart rate, respirations, fever, and inadequate blood flow to organs. One of the most prevalent causes of sepsis is *Staphylococcus aureus* (*S. aureus*). With increasing numbers of strains of bacteria becoming antibiotic resistant, new methods for the treatment and clearance of sepsis are needed. Studies have shown that the lipid lowering drug simvastatin is protective for incidence of sepsis, having immunomodulatory effects and anti-inflammatory properties, specifically. Thus, it may be an alternative way to prevent sepsis due to *S. aureus* infections. Studies in our laboratory have shown that simvastatin pretreatment increases survival of mice infected with *S. aureus* and alters the adaptive immune response such that levels of IgG2c are reduced to the level of uninfected controls. Our studies have demonstrated that while simvastatin does not enhance bacterial clearance, or affect serum C5a levels, it does decrease serum levels of TNFα.