CHAPTER IV: SUMMARY

Over the past two decades, MRSA has rapidly spread throughout the hospital and community, despite control efforts and policies. In the late 1960s and 1970s, the prevalence of MRSA infection was below 5% in most hospital worldwide. Currently, the prevalence of MRSA infection has increased up to 40% in several hospitals. Treatment of infections caused by MRSA is costly due to the requirement for prolonged hospitalizations and increased laboratory use for extensive surveillance or screening. Therefore, in order to reduce the cost of treatment and to prevent morbidity and mortality associated with MRSA infections effective alternative therapeutic targets are urgently required.

S. aureus is one of the most common bacterium causing sepsis and septic arthritis. A main challenge in treatment of *S. aureus* is its enhanced survival in blood stream and various virulent factors. One of the recently studied factors causing *O*-acetylation of peptidoglycan backbone of the *S. aureus* cell wall has been reported as the main cause of the immune evasion from the action of the lysozyme and hence causes enhanced survival and associated clinical outcomes. There has been lack in *in vivo* studies to evaluate the systemic response of the *O*-acetylated cell wall *vs.* de-*O*-acetylated cell wall containing bacterium in order to understand, if this is the key factor for the enhanced survival of *S. aureus* in host tissue and blood stream.

Overall, our findings demonstrated *O*-acetylated PGN of *S. aureus* is an important determinant for clinical severity in sepsis and septic arthritis. Our finding shows less severe disease outcome in case of Δ*oat*A infected mice group compared with wild type SA113 infected mice group. Thus, OatA could be a potential therapeutic target to prevent *S. aureus* infections.