Exploring Allicin from Garlic as a Method of Wound Control in Soft Tissue Infections

Lauren J. Johnson, Fawn Beckman, and J. David McDonald

Department of Biological Sciences, Wichita State University

The antimicrobial properties of allicin, while long known, require further investigation in order to evaluate this garlic-derived chemical as an anti-infective agent against Staphylococcus aureus wound infection. S. aureus is well adapted to live on skin as either normal flora or as a pathogen. Indeed, it is carried as normal flora by approximately one-third of all people. Thus, there is an important ongoing clinical problem with wound infection by this pathogen along with the fact that antibiotics continue to lose their effectiveness against strains. This has motivated us to explore alternative methods to deal with this common clinical problem and allicin quickly emerged as an agent worthy of testing in a standardized wound infection model. Using a mouse model, we followed wound progression in the presence of different levels of allicin applied at the wound site, and compare that to uninfected and untreated controls. We followed the progression of this infection in a number of ways: visually (by periodic photography of the wound site), through the quantitative determination of inflammatory cytokine gene expression by the mouse host, through the quantitative determination of virulence factor gene expression by the pathogen, and histologic staining and microscopic analysis of wound tissue. These forms of analysis will serve as the basis for determining whether allicin is effective at controlling wound infection and, if so, to perhaps yield important clues about the mechanism by which it operates. These clues may be useful in designing more effective control on wound infection in the future.