

Pilus Assembly by Sortase Enzymes and Applications to Bioconjugation



Abstract. Pathogenic Gram-positive bacteria cause a range of serious infections in humans and represent a significant threat to global health. The rising emergence of virulent strains which are resistant to our current arsenal of antibiotics escalates these dangers. Gram-positive bacteria display an array of proteins on their cell surface that enable them to interact with their environment. Gram-positive pili are long filaments, constructed by specialized sortase enzymes through isopeptide linkages, which mediate adhesion to host tissues in the early stages of infections. Using an integrated approach including structural, biophysical, biochemical and cellular techniques, we have elucidated the assembly mechanism and explored the origins of pilus mechanostability using the archetypal SpaA-pilus from *Corynebacterium diphtheriae*. Additionally, we are interested in leveraging sortase biology to develop novel bioconjugation approaches. In this vein, we developed a platform for enzyme anchoring on nanocages to promote enzyme synergy and successfully repurposed pilin polymerizing sortases for protein engineering applications. This research provides new insight into the biogenesis mechanism that is used by Gram-positive bacteria to produce adhesive pili and yielded promising new tools for producing bioconjugates.

Scott McConnell

from

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1:00 pm

<https://ucla.zoom.us/j/91972511193>

Meeting ID: 919 7251 1193