Surface Plasmon Resonance Spectroscopy for the Specific Near-Real Time Detection of *Staphylococcus aureus*

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Detection of deadly pathogens is an important task in today's world. *Staphylococcus aureus* is a gram-positive bacterium that may be a cause of multiple illnesses such as food poisoning, urinary tract infections, osteomyelitis, pneumonia and endocarditis. Traditional methods like enzyme linked immunosorbent assay (ELISA), fluorescence label method are time consuming, expensive and require trained personnel. SPR spectroscopy is a well-recognized technique for label-free monitoring of different biomolecule interactions, including specific antigen – antibody binding. We are detecting *S. aureus* employing anti *S. aureus* rabbit IgG, biotinylated Protein A and dual-channel Spreeta ™ sensor. Dual channel sensor is preferable to use in the measurements involving real-world samples since it is able to eliminate many sources of error such as non-specific binding and temperature variations.

Protein A, a cell wall protein found in most species of *Staphylococci* was used for proper orientation of antibody on the sensor surface. Self assembled monolayer of 11-mercaptoundecanoic acid (MUA) was first fabricated on gold surface, followed by biotinylated Protein A layer through amine coupling. Bovine serum albumin (BSA) blocker significantly reduced non-specific binding. The lowest concentration of *S. aureus* detected was 10^2 CFU/ml. Detection time for the lowest concentration of *S.aureus* was 70 minutes which was very less when compared to the time taken by the traditional methods.