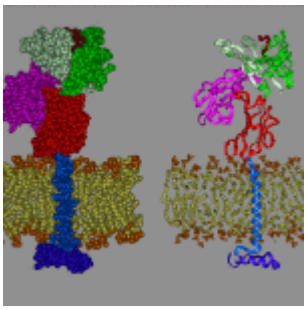
Extracellular vesicles as a vaccine candidate against Staphylococcus aureus infections



Staphylococcus aureus (S. aureus) is the major cause of pneumonia, osteomyelitis and sepsis and is also one of the main causative bacteria of nosocomial infections. Currently, antibiotics are administered to those infected; however there is a growing increase of drug resistance and methicillin-resistant S. aureus (MRSA) is quite prominent in hospitals. There is need for a vaccine candidate, which will serve as a cost-effective alternative for control and prevention of infections. A study recently published in the PLoS One journal, evaluated the potential of S. aureus extracellular vesicles (SEV), which are derived from the bacteria and contain bacterial proteins, nucleic acids, and lipids, as a vaccine for the prevention of infection.

The findings demonstrate the immunization with SEVs induced both antibody and T cell responses. The SEVs also induced protective immunity such as the up-regulation of co-stimulatory molecules and the expression of T cell polarizing cytokines in antigen-presenting cells. These immune responses were sufficient to protect against both lethal and non-lethal S. aureus pathogenic challenges in the mice. This study demonstrates an innovative strategy in vaccine development against S. aureus infections. SEVs induce both cellular and

antibody responses, which confer protection against infections.

Choi, S. et al. 2015. Active Immunization with Extracellular Vesicles Derived from Staphylococcus aureus Effectively Protects against Staphylococcal Lung Infections, Mainly via Th1 Cell-Mediated Immunity. *PLOS*.