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Tetravalent protein vaccine against *Staphylococcus aureus*

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Abstract

Staphylococcus aureus causes wide range of diseases from minor infections to life-threatening sepsis, endocarditis, and pneumonia. Several antigens have been identified so far as vaccine that, either alone or in combination have the ability to reduce *S. aureus* (including multi drug resistant strains) colonization in animal models but with little success. Here we explored the possibility of designing a vaccine based on non-covalently surface associated proteins (NCSPs) of *S. aureus*. The known NCSPs proteins [GM, Aaa, LytM, IsaB, SEM, SsA, Amidase(AM), LytR, LytN ,and SAV-1056] were cloned and expressed in *E. coli* as N-terminal histidine tagged protein and purified using Ni-NTA chromatography. The antigenicity of these proteins was tested against sera from *S. aureus* infected mice using ELISA and immunogenicity tested using mice splenocyte proliferation assay. All the NCSPs were antigenic and immunogenic; however the degree differed among NCSPs. The shortlisted proteins, with high homology score across different *S. aureus* strains, were used for vaccination study in BALB/c mice. The selected proteins were found to trigger Th1 response in splenocyte proliferation assay. Upon vaccination with a cocktail of NSCPs in BALB/c mice, we observed that all the vaccinated mice survived till the 9th day, and 6 survived till day 14 (75% survival). Only 1 out of 8 non-vaccinated mice survived after lethal challenge with *S. aureus*. There was 6-7 fold reduction in the bacterial load in internal organs of vaccinated mice. The sera of the vaccinated mice were capable of inducing opsonophagocytosis of *S. aureus* by human polymorphonuclear leukocytes**.**

Biography

Nisha N is currently undergoing her PhD program in the field of Infectious diseases at Amrita Center for Nanosciences and Molecular medicine, AIMS, Kochi. She has been awarded with Senior Research Fellowship by Indian Council of Medical Research, India. She has two second author publications to her credit and her main work yet to be published.

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