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A novel recombinant bivalent plague vaccine rVE confers effective protection against *Yersinia enterocolitica* surrogate infection in mouse model

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The present study was aimed to develop a recombinant subunit vaccine against plague and characterize the protective efficacy using *Yersinia enterocolitica* surrogate infection model. *Yersinia* type III secretion system (T3SS) components, LcrV and YopE are one of the most important virulence factors and protective antigens. The candidate vaccine consisting of immuno-dominant regions of *Y. pestis* LcrV (rV) and YopE (rE) antigens fused to a single molecule, expressed and purified by using *E. coli* expression system. Immunization of BALB/c mice with purified rVE elicited significantly higher antibody titers with balanced expression of IgG1 and IgG2a/IgG2b. Splenocytes obtained from rVE immunized mice revealed significant increase ($P < 0.001$) in proliferation with co-expression of CD4+ and CD8+ T-cells and associated pro-inflammatory and anti-inflammatory cytokines including TNF- α , IFN- γ , IL2, IL4 and IL12. Mice immunized with rVE or anti-rVE poly sera exhibited complete protection ($P < 0.001$) against *Y. enterocolitica* (10^8 CFU) I P challenge, in contrast, sham immunized mice groups showed significant infection signs upon pathogen challenge. Moreover, cellular immune responses elicited against rVE were capable of maintaining complete protection against *Y. enterocolitica* infection about four months from the day of final immunization. In conclusion, the developed recombinant rVE fusion protein can act as a potential subunit vaccine candidate for therapeutic application against *Yersinia* infections in humans and other farm animals.

Biography

Amit Kumar Singh is currently pursuing PhD in Microbiology on topic entitled, "Studies on immunodominant protective antigens for candidate vaccine against plague using *Yersinia enterocolitica* surrogate model". (Since Oct 2011 to till date). He has a Masters degree in Biotechnology (2007), offering 7+ years of research experience and also worked as a Senior Research Fellow on various international funded research projects.

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