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Title:	Understanding the Role of OmpV, an Outer Membrane Protein of Salmonella Typhimurium Towards Bacterial Pathogenesis and Host Immune Activation
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Abstract:	<p>Salmonella typhimurium is a gram-negative bacterium that causes salmonellosis, a type of gastroenteritis, in human, and typhoid-like symptoms in mice. To date, no vaccine candidate is available for the treatment of salmonellosis, and antibiotics are the only mode of treatment. However, due to the emergence of multi-drug resistant strains of non-typhoidal Salmonella, it is essential to explore vaccine candidates against salmonellosis. Many factors involved in the pathogenesis of S. typhimurium are known, but some unknown factors limit our knowledge regarding the pathogenesis of S. typhimurium. In this thesis, we have studied one such uncharacterized outer membrane protein OmpV of S. typhimurium. Deletion mutant studies revealed that OmpV helps in adhesion and invasion of S. typhimurium into the intestinal epithelial cells. Further, we found that OmpV binds to $\alpha 1 \beta 1$ integrins on the surface of the intestinal epithelial cells with the help of extracellular matrix component fibronectin. Further, downstream to the receptor activation, OmpV can activate focal adhesion kinases leading to the actin modulation, which is a prerequisite for the invasion of S. typhimurium. Furthermore, we observed much lesser colonization of S. typhimurium upon infection in mice in the absence of OmpV. Thus, OmpV is indicated as a crucial player in the pathogenesis of S. typhimurium. Further, we have shown that immunization of mice with OmpV protein leads to adaptive responses (T cell and B cell activation leading to antibody production) and protection against S. typhimurium infection. Along with modulation of adaptive immune responses, we found that OmpV modulates the innate immune responses. Therefore, this study not only revealed OmpV as a crucial adhesin important for pathogenesis, but also established it as a strong candidate for the sub-unit vaccine against the S. typhimurium infection.</p>
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