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Title:	Outer membrane protein OmpV mediates Salmonella enterica serovar typhimurium adhesion to intestinal epithelial cells via fibronectin and $\alpha 1\beta 1$ integrin
Authors:	Kaur, Deepinder (/jspui/browse?type=author&value=Kaur%2C+Deepinder) Mukhopadhyaya, Arunika (/jspui/browse?type=author&value=Mukhopadhyaya%2C+Arunika)
Keywords:	Caco-2 ECM F-actin Invasion
Issue Date:	2020
Publisher:	John Wiley & Sons Ltd
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Abstract:	Salmonella typhimurium is an invasive Gram-negative enteric bacterium, which causes salmonellosis, a type of gastroenteritis in humans and typhoid-like symptoms in mice. Upon entering through the contaminated food and water, S. typhimurium adheres, colonises, and invades intestinal epithelial cells (IECs) of the small intestine. In this study, we have shown that upon deletion of the outer membrane protein OmpV, there is a significant decrease in adherence of S. typhimurium to the IECs, indicating that OmpV is an important adhesin of S. typhimurium. Further, our study showed that OmpV binds to the extracellular matrix component fibronectin and signals through $\alpha 1\beta 1$ integrin receptor on the IECs and OmpV-mediated activation of $\alpha 1\beta 1$, resulting in the activation of focal adhesion kinase and F-actin modulation. Actin modulation is crucial for bacterial invasion. To the best of our knowledge, this is the first report of an adhesin mediated its effect through integrin in S. typhimurium. Further, we have observed a decrease in pathogenicity in terms of increased LD50 dose, lesser bacterial numbers in stool, and less colonisation of bacteria in different organs of mice infected with $\Delta ompV$ mutant compared with the wild-type bacteria, thus confirming the crucial role of OmpV in the pathogenesis of S. typhimurium.
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