

Abstract


Title of thesis:

“Preparation of immunogen from prevalent strains of diarrheagenic *Escherichia coli* and evaluation of its protective efficacy in animal model to reduce diarrheagenic *Escherichia coli* mediated clinical health burden”

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In developing countries, diarrhea-induced morbidity and death in children can be attributed primarily to diarrhoeagenic *Escherichia coli* (DEC) pathotypes. There are currently no licensed vaccines available that offers broad-spectrum protection against infections caused by DEC. Several immunogenic proteins are found in outer membrane vesicles (OMVs), which are microvesicles secreted by gram-negative bacteria during the growth phase. We have developed a pentavalent outer-membrane vesicles (POMVs) based immunogen that targets the five primary pathotypes of DEC that cause diarrheal diseases, taking into account the prevalence of infections. Adult BALB/c mice were administered with 10µg of the POMVs intraperitoneally after OMVs were isolated from five DEC pathotypes and combined in equal amounts to develop POMVs immunogen. In adult mice, three doses of POMVs significantly increased the cellular immune response in addition to inducing a strong humoral immune response against whole cell lysates (WCLs), outer membrane proteins (OMPs), and lipopolysaccharides (LPS) isolated from DEC pathotypes. Neonatal mice were effectively protected against DEC infections by the passive transfer of POMVs immunized sera of adult mice. Overall, this study reveals that POMVs are immunogenic, providing neonatal mice with broad-spectrum passive protection against five major DEC pathotypes. Taken together, our results indicate that POMVs could serve as a potent vaccine candidate to reduce the health burden caused by DEC.


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