

## Developing a Vaccine against the Porcine Rotavirus using *Lactobacillus Plantarum* Cells

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Porcine rotavirus infection is a significant cause of morbidity and mortality in the pig industry necessitating the development of effective vaccines for the prevention of infection. Gut mucosal immune responses are likely to play significant role in protective immunity against rotavirus infection because rotaviruses are enteric pathogens.

Lactic acid bacteria (LAB) are Gram-positive, nonpathogenic microorganisms that are gaining to a great concern as antigen producers for improvement of live vaccine vectors. Heterologous proteins of dissimilar source have been effectively expressed in various LAB species. Recombinant *L. Plantarum* NC8 strains have been shown to induce specific local and systemic immune responses against a range of antigens.

The objective of this study was constructing a *Lactobacillus Plantarum* NC8 strain expressing the heterologous VP7 porcine rotavirus protein and investigating its outcome and its ability acting as an antigen delivery system for oral vaccinations on mice.

The expression of recombinant pSIP409-VP7-DCpep was confirmed by SDS-PAGE and Western blot analysis and surface-displayed expression on *L. Plantarum* was verified by immunofluorescence. Mice orally immunized with recombinant protein-expressing *L. Plantarum* produced high levels of serum immunoglobulin G (IgG) and mucosal IgA. The IgA titers from mice immunized with NC8-pSIP409-VP7-DCpep were higher than titers from pSIP409-VP7-DCpep -immunized mice. The induced antibodies demonstrated neutralizing effects on RV infection.

The outcome of this study is a hopeful step toward developing a vaccine against the porcine rotavirus using *Lactobacillus plantarum* cells as bioreactors for competent antigen production and delivery to the mucosal surface.