### Abstract

Surface (S-) layers, structural entities that surround the cell envelope of various bacteria, are comprised of a porous lattice of identical protein or glycoprotein subunits. Interestingly, the S-layer is able to promote adherence to host epithelial cells in a variety of *Lactobacillus* species. *L. amylovorus* DSM 16698, a strain of porcine origin, encodes at least three putative types of S-layer proteins in its genome sequence. In this study the surface structure of *L. amylovorus* DSM 16698 strain and the adhesion properties of its S-layer proteins to porcine intestinal epithelial IPEC-1 cell line were examined based on preliminary results. In addition, host receptors potentially specific for S-layer proteins were isolated from IPEC-1 cells.

Cloned recombinant S-layer proteins rSlpA and rSlpB of DSM 16698 were reassembled onto fluorescent-labeled *L. amylovorus* cell wall extracts as a means to mimic the native S-layer lattice structure. Adhesion between the reassembled recombinant S-layer complexes and IPEC-1 cells was assessed qualitatively by microscopy and quantitatively by measuring fluorescence intensity. Results from *in vitro* adhesion assays indicate that the rSlpA and rSlpB proteins both mediated the adherence of the *L. amylovorus* DSM 16698 strain to porcine intestinal epithelial cells. Antibody-mediated adhesion inhibition experiments were also performed, in which the two rSlps were pretreated with their specific anti-rSlp serum, and showed that adhesion between the rSlps and IPEC-1 cells could be inhibited by the antibody treatment. Moreover, by using fluorescent-labeled rSlp-specific antibody, the surface structure of *L. amylovorus* cells was microscopically examined. With this immunofluorescent technique, the SlpA and SlpB proteins were both observed to localize on the cell surface and exhibit a similar distribution pattern. Putative S-layer host cell receptors were isolated from the interaction between the reassembled rSlp/cell wall complexes and IPEC-1 derived membrane proteins using a SDS-PAGE-based system. Receptor isolation experiments resulted in repeatedly the same protein profile.

It has previously been shown that *L. amylovorus* DSM 16698 attaches to IPEC-1 cells, but the identities of surface-localized components that mediate this microbe-host interaction had yet to be determined. In this present study, S-layer proteins were found to be an important mediator in the interaction between *L. amylovorus* DSM 16698 and a porcine epithelial cell line. Additionally, it was shown how S-layer proteins are localized on the surface of *L. amylovorus* DSM 16698 cells.