

MS03-P21 | THE N-TERMINAL DOMAIN OF LACTOBACILLUS ACIDOPHILUS SLP A PROMOTES SELF-ASSEMBLY OF THE S-LAYER ARRAY

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Surface layer proteins (S-layers) represent the outermost cell envelope in many bacteria and archaea. They assemble into highly regular 2D crystalline arrays composed of mostly single protein or glycoprotein species. These arrays are in close contact with their surrounding and fulfil various functions like bacterial adherence to other cells or substrates, protection against life-threatening conditions and maintenance of the cell shape.

The S-layer of *L. acidophilus* consists of two proteins. SlpA is mainly expressed under normal physiological conditions, whereas SlpX expression is increased under osmotic stress. They have two functional regions: the C-terminal region that is important for the attachment to the cell wall and the N-terminal region for the self-assembly of the S-layer array.

Our goal is to structurally characterize the S-layer protein SlpA of *L. acidophilus* and further understand the mechanism of the self-assembly. Since full length S-layers form insoluble 2D crystal we designed three functional protein fragments. We obtained crystals of fragments important for self-assembly formation. The structure of the first fragment was solved with a serine to cysteine mutant co-crystallized with mercury by Hg-SAD and later by molecular replacement with data from native crystals at 2.2 Å resolution. The structure of the second fragment was solved *ab initio* with ARCIMBOLDO with a resolution of 1.4 Å. Both structures together suggest the mode of action how the self-assembly of the SlpA protein occurs. Furthermore, the putative exposed areas of the S-layer, which are important for potential interactions with the environment are analysed.