

**S5 Fig. Gram-positive *Streptococcus* PTS and Gram-negative *Streptobacillus* ABC transporter.**

In *Streptococcus*, hyaluronan is depolymerized to unsaturated hyaluronan disaccharide by cell-surface hyaluronate lyase. Unsaturated hyaluronan disaccharides are incorporated into the cytoplasm by the PTS with the phosphorylation at the C-6 position. Imported disaccharides with the phosphate group are degraded to monosaccharides by cytoplasmic UGL (left). In *Streptobacillus*, depolymerized GAG disaccharides with sulfate groups are incorporated into the cytoplasm by the ABC transporter (Smon0121-Smon0122/Smon0120-Smon0120) through the periplasmic solute-binding protein (Smon0123) without any substrate modification (right).