

## Description of Additional Supplementary Files

File Name: **Supplementary Data 1**

Description: Plasmids used in this study.

File Name: **Supplementary Data 2**

Description: Strains used in this study.

File Name: **Supplementary Data 3**

Description: Primers used in this study.

File Name: **Supplementary Data 4**

Description: Gene sequences and protein sequences of the following enzymes

**HasA**: HA synthase genes;

**GalU**: Glucose-1-phosphate uridylyltransferase;

**UgdA**: UDP-glucose 6-dehydrogenase;

**GlmS**: L-Glutamine-D-fructose-6-phosphate aminotransferase;

**GlmM**: Phosphoglucosamine mutase;

**GlmU**: UDP-N-acetylglucosamine pyrophosphorylase / Glucosamine-1-phosphate N-acetyltransferase;

**Cg0420**: Putative glycosyltransferase of *C. glutamicum* ATCC 13032;

**Cg0424**: Putative glycosyltransferase of *C. glutamicum* ATCC 13032.