



Fig.S1 Scheme of integration of *pdc-adh* cassette into *S. elongatus* PCC 7942. **(a)** Design of *adh-pdc* expression construct. **(b)** Design of *glgC* knockout construct. **(c)** Genotype analysis of  $\Delta$ APX. Lane I DNA ladder (Fermentas), lane II is the PCR product of *adh-pdc* in plasmid, lane III is the PCR product of *NS1* in wild type. Lane IV, V and VI are the PCR products of *pdc-adh* in engineered strain  $\Delta$ GK- $\Delta$ APX. **(d)** Genotype analysis of *glgC* knockout in  $\Delta$ GK- $\Delta$ APX. Lane I is the marker, Lane II is the *glgC-Km<sup>r</sup>* in plasmid, Lane III is the *glgC* in wild type and Lane IV is the *glgC-km<sup>r</sup>* in  $\Delta$ GK- $\Delta$ APX. These results indicated the *pdc* and *adh* genes were successfully inserted into the *NS1* site of the genome and *glgC* gene is knocked out by *km<sup>r</sup>* cassette.