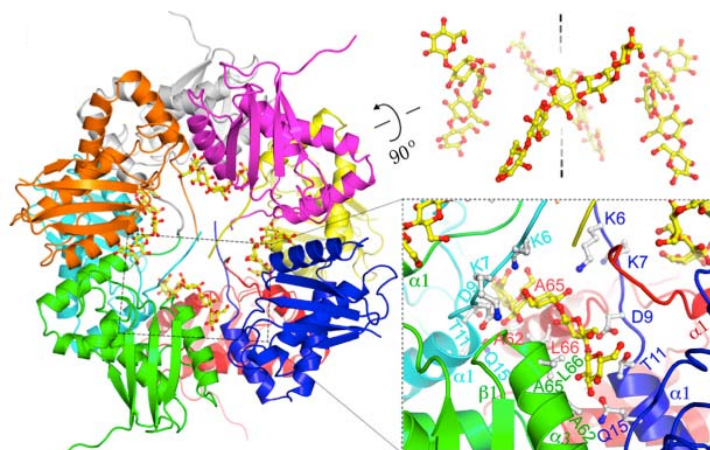


Structure analysis of bacterial cellulose synthase subunit D

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The cellulose synthesizing terminal complex, consisting of at least four subunits, AxCeSA (cellulose synthase subunit A), B, C and D in *Acetobacter xylinum*, spans the outer and inner membranes to synthesize and extrude glucan chains. We determined the structures of subunit D (AxCeSD/AxBcsD), and the complex with cellopentaose (CPT). The structure of AxCeSD shows an exquisite cylinder shape with a right-hand twisted dimer interface on the cylinder wall, formed by octamer as a functional unit. All N termini of the eight AxCeSD molecules extend to the center of the cylinder and create four individual passageways. The structure of AxCeSD-CPT complex shows that CPTs are located at the four spiral passageways along the dimer interface (figure). It suggests that synthesized glucan chains may extrude through the inside of AxCeSD cylinder. Moreover, such unique construction of AxCeSD passageways may help spin glucan chains and assemble them together to form sub-elementary fibril.

Reference

- (1) Structure of bacterial cellulose synthase subunit D octamer with four inner passageways
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- (2). Cellulose squeezes through.
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