

Structural and Functional Characterization of Novel Carbohydrate Deacetylase from Bacteroides

Tuesday, 9 June 2026 14:00 (45 minutes)

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Bacteroides ovatus, a commonly identified *Bacteroides* species in the human gut, has been shown to have beneficial effects like the suppression of intestinal inflammation. However, increased populations of *B. ovatus* also correlate with several autoimmune disease states, such as Systemic Lupus Erythematosus (SLE). Many host-microbe interactions depend on bacterial cell surface carbohydrates, including capsular polysaccharides (CPS). CPS from related *B. fragilis* has known immunomodulatory effects. While their significance is understood, CPS biosynthesis has not been well studied. In this talk, we present structural characterization of a polysaccharide deacetylase from *Bacteroides ovatus* (BoPDA) thought to be involved in CPS biosynthesis. High resolution crystal structures reveal an unusual metal binding strategy for the CE4 family and an atypical, non-modular domain architecture. Carbohydrate binding assays and deacetylase activity assays were used to investigate the function of the enzyme. BoPDA is the first protein CPS biosynthetic enzyme from *B. ovatus* to be characterized, so this work helps further our understanding of this essential bacterial process.

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Session Classification: Science and Engineering Research

Track Classification: Science and Engineering Research