Abstract

Biochemical and structural study of the interaction of carbohydrate-based inhibitors with the FimH adhesion.

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Urinary tract infections (UTIs) are among the most common bacterial infections. The majority of these infections are caused by uropathogenic Escherichia coli (UPEC). The increased multi-drug resistance of UPEC has highlighted the need of effective alternative therapeutic approaches. UPEC express type 1 pili on their bacterial surface, which contain a FimH adhesin to adhere, colonize and invade bladder cells, consequently causing a UTI.

In this study, we unravelled the molecular interactions between FimH and its minimal receptor epitope. Based on the obtained structural data, new soluble receptor analogues were rationally designed and evaluated on their potential as anti-adhesives to inhibit the FimH-mediated bacterial attachment of UPEC to the bladder for use as non-antibiotic treatment and prophylactic agent of UTIs.