

Glycobiology of a Novel *Tannerella* Species

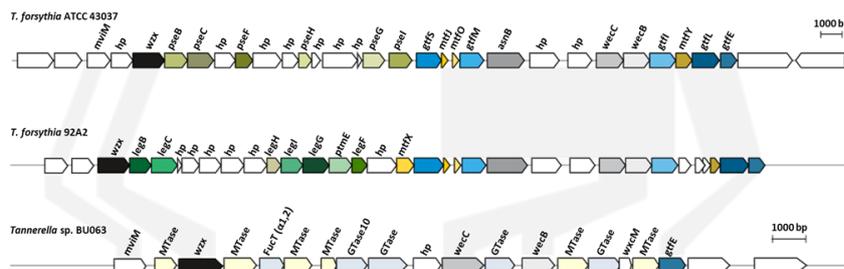
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Der Wissenschaftsfonds.

The recently identified bacterium *Tannerella serpentiformis* is the closest phylogenetic relative of *Tannerella forsythia*, whose presence in oral biofilms is associated with the prevalent inflammatory disease periodontitis. Conversely, *T. serpentiformis* is considered health-associated.

We found that *T. forsythia*'s unique cell surface protein glycosylation is decisive for its relationship with other biofilm bacteria and the host through mediation of glycobiological and glycoimmunological interactions. Glycosylation of known periodontitis-associated *T. forsythia* strains is encoded in a distinct gene cluster, while the genome of *T. serpentiformis* reveals a different gene cluster. We hypothesize that an altered glycome contributes to the difference of periodontal pathogenesis in *Tannerella* species and provides a new foundation to further understand the genome evolution and mechanisms of bacteria-host interaction in closely related oral microbes with different pathogenicity potential.



Comparison of protein glycosylation gene clusters of different *Tannerella* species.
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This project generates glycobiology information on a novel oral *Tannerella* species and aims at delineating glycobiology-mediated mechanisms that could support the association of this bacterium with periodontal health. Methods include anaerobic bacterial cultivation, glycan structure elucidation, glycoproteomics, genetic manipulation, immune response profiling, biofilm techniques, and imaging. In relation to the glycobiology knowledge of the pathogenic relative *T. forsythia* this project might provide novel insights into the pathogenesis of periodontitis and pinpoint novel therapeutic and prophylaxis approaches against the disease. It also furthers our knowledge on the *Bacteroidetes* phylum that is prominent not only in the oral but also in the gut microbiome.