

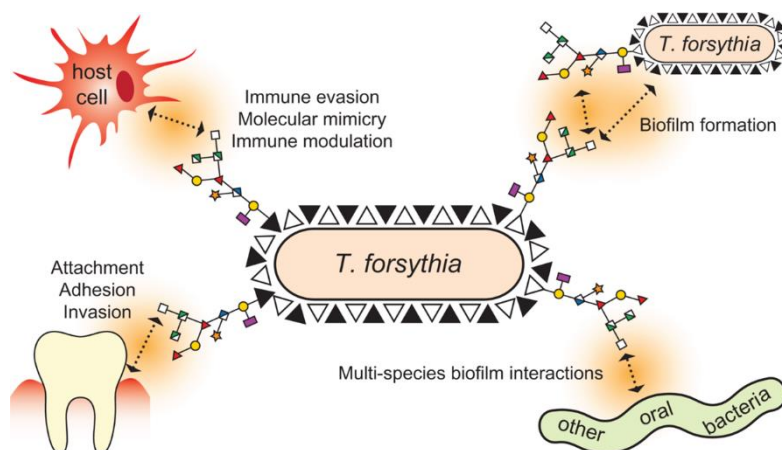
## Tannerella forsythia and Host Immune Response to Oral Biofilms

PIs: Oleh Andrukhov (corresponding PI), Christina Schäffer; Project: FWF P34642



The maintenance of the oral microbiome-host homeostasis is controlled by the host immune system. A dysbiotic state can favor the development of the inflammatory, polymicrobial disease periodontitis. Periodontitis is associated with increased numbers of the "red complex" bacteria-*Porphyromonas gingivalis*, *Treponema denticola* and *Tannerella forsythia*-in oral biofilms and distinct bacterial virulence factors facilitate cell invasion eventually causing tissue destruction.

This interdisciplinary project investigates *T. forsythia* for its host-manipulative capability. The pathogen will be incorporated in a commensal oral model biofilm, once alone, and once together with the keystone periodontal pathogen *P. gingivalis* to identify possible synergistic effects, followed by challenging diverse human cells with these multispecies biofilms. Different biofilm-cell co-culture models will be used to determine the biofilm-induced response in epithelial cells, neutrophils, macrophages, and gingival cells, which constitute the first line of defense against bacterial infection. Additionally, the expression of *T. forsythia*'s virulence factors upon infection will be analyzed. Our project features cell culture, microbiology, microscopy, and transcriptomics techniques. The project outcome will provide insights into *T. forsythia*'s role in disturbing the balance between the host immune system and the commensal oral microbiota. The obtained results might pinpoint novel therapeutic and prophylaxis approaches against periodontitis. Learning about new facets of microbe-host interactions will contribute to increasing our understanding of how bacteria thrive in our body.



*T. forsythia* employs its unique cell surface O-glycans to persist in the oral cavity. © Valentin Friedrich, Schäffer Research Group, BOKU Vienna.