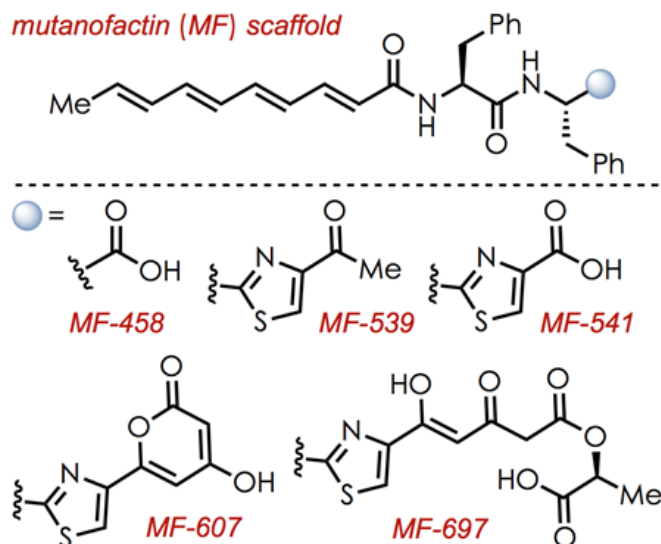


Mutanofactin - A Molecular Adhesive in Cariogenic Microbial Biofilms?

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Dental caries is one of the most prevalent global chronic diseases. It is intimately linked to the establishment of a dysbiotic oral biofilm consortium on the tooth surface (dental plaque), in which *Streptococcus mutans* plays a key role. Many proteins produced by *S. mutans* supporting biofilm formation have been studied. Mutanofactins were recently identified as small-molecule secondary metabolites of *S. mutans*. Only one has been investigated and shown to promote cell adhesion and biofilm formation significantly. It was suggested to increase bacterial cell surface hydrophobicity; however, detailed insights into the molecular mechanism of mutanofactin action are lacking. Our project explores the molecular mechanisms underlying cariogenic biofilm development triggered by *S. mutans*-produced mutanofactins. This requires reconstituting biological systems of incrementally increasing complexity using defined components and methods for analysis and monitoring, spanning the range from the molecular level to single- and multi-species biofilms. Our project features a unique combination of synthetic, microbiological and physicochemical approaches, including *de novo* syntheses and novel techniques to characterize bacterial cell surface properties and biofilm matrix interactions. Its outcomes will inform innovative, effective anti-cariogenic strategies urgently needed for human health and reducing the global economic burden of tooth decay.



Chemical structures of natural mutanofactins.
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