

Innovation and Research Week

שבוע חדשנות ומחקר

The Role of Bacterial Autoinducer Molecules in the pathogenesis of Recurrent-tonsillitis A Novel discoveries and impact on Biofilm

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Background

Bacterial biofilms play a role in upper respiratory tract diseases, including recurrent tonsillitis and obstructive sleep apnea (OSA). Bacterial cooperation based on population density is termed Quorum Sensing. Quorum Sensing enables bacteria to form biofilm, virulence factors and more. Autoinducers are molecules produced by bacteria which allows bacterial communications and interaction. This is the first study to examine the role of QS in the upper respiratory tract infection

Aims

To explore novel molecules which may play a role in the pathogenesis and impact of biofilm in recurrent tonsillitis

Methods

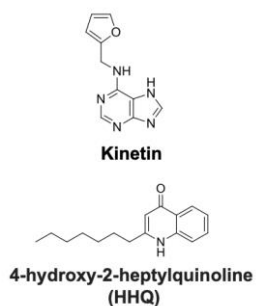
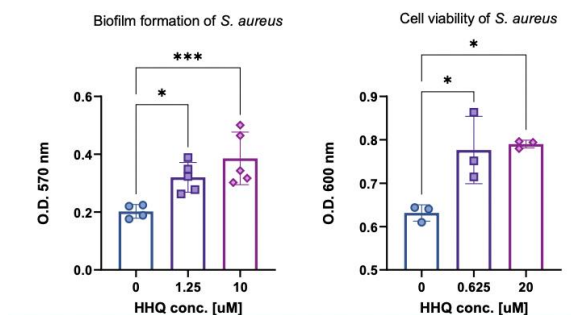
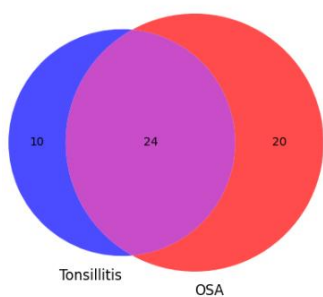
Tonsils and Adenoid tissue were collected from children with recurrent tonsillitis (study) and OSA (control). Bacteria was identification using MALDI-TOF then metabolomic profiling using MS analysis for possible autoinducer molecules were explored. Sub-analysis for *P. Aeruginosa*, *Staph. Aureus* and *Strep. Dysgalactiae* was further examined for biofilm formation.



Results

120 tissue samples from 26 patients (12 study, 14 control) were collected. 45 types of bacteria were found in both groups with no statistical different $p > 0.05$.

Two molecules were discovered, a novel molecule Kinetin and a known autoinducer HHQ but for the first time in the linkage to Recurrent tonsillitis. This molecules were only expressed in the study group and non in the control group (83% vs. 0%, $p < 0.05$). Each of the molecules was significantly associated with biofilm formation in each of the sub-analysis bacteria (52%-87%, $p < 0.05$).



Discussion and Conclusions

In the study we discovered a new molecule Kinetin as an Autoinducer molecule. The effect of Kinetin and HHQ on biofilm formation was significant on different types of bacteria.