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Structural studies of lipopolysaccharides expressed by non-typeable *Haemophilus influenzae* and *Haemophilus parainfluenzae* strains

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ABSTRACT

The present thesis describes lipopolysaccharide (LPS) structures expressed by non-typeable *Haemophilus influenzae* and *Haemophilus parainfluenzae* strains. LPS is a major surface component of Gram-negative bacteria. Structural studies of LPS are very important for understanding the adaptive mechanisms which help bacteria to survive in the host environment.

Non-typeable *Haemophilus influenzae* (NT*Hi*) is a common human commensal of the nasopharynx. It is also pathogenic and causes both acute and chronic diseases, such as otitis media, sinusitis, pneumonia and bronchitis. *H. influenzae* expresses rough type LPS (lacking O-antigen), which is implicated as a major virulence factor. 25 NT*Hi* otitis media isolates were selected for structural studies of LPS. These clinical isolates represent the structural diversity of LPS in the natural population.

Structural studies of *H. influenzae* LPS have resulted in a molecular model consisting of a conserved (*P*Etn)-substituted triheptosyl inner-core moiety (HepI–HepII-HepIII) in which each of the heptose residues can provide a point for elongation by oligosaccharide chains (outer-core region).

NT*Hi* strains 1158/1159 and 1232, described in this thesis, were selected from this collection of clinical isolates. These strains express additional D,D-Hep residue in the outer-core region of LPS.

***Haemophilus parainfluenzae* is a part of normal human flora. Previous studies have indicated that *H. parainfluenzae* express LPS structures that are very similar to those expressed by *H. influenzae*. On the other hand some *H. parainfluenzae* strains express O-antigen containing LPS. The structures of the O-antigen from *H. parainfluenzae* strains 20 and 16 are described in this thesis.**

The structural investigations of LPS of *H. influenzae* and the comparison with LPS expressed by *H. parainfluenzae* will increase the knowledge of biological properties of LPS and its role in bacterial virulence.