



Project SE-1

Identification of novel complement evasion mechanisms developed by bacterial pathogens

(Supervisors: Prof. Anna Blom, Prof. Suzan Rooijackers)

The project is focused on discovery of new complement evasion mechanisms developed by bacterial pathogens. One of the studied bacteria will be opportunistic *Filifactor alocis*, a recently identified periodontal pathogen of major importance but still poorly studied. *Filifactor* is exceptionally resistant to complement-mediated killing (i.e. serum resistant) and likely several evasion molecules/mechanisms will be identified. This will be achieved using advanced methods such as phage display of secreted proteins and transposone mutagenesis of all genes. Once established, both methods will be also applied to other clinically relevant bacterial pathogens, *Porphyromonas gingivalis* (transposone) and *Neisseria* (phage display). In the next step, the identified proteins will be recombinantly expressed, purified and studied in detail for their effect on all steps of the complement cascade using methods already well established in the group. Further, deletion mutants or knock-ins of the relevant genes will be created in bacterial strains to assess their relevance in context of the whole organism. The prevalence of expression of the identified virulence factors will be assessed in collections of clinical bacterial strains available in the group in order to assess if they are broadly expressed and thus could be targeted for therapy. Further, we will test new therapeutic approaches based on identified virulence mechanisms, including testing fusion proteins, which utilize the fact that many bacterial pathogens capture human complement inhibitors such as C4BP or factor H.

The student will have opportunity to learn many microbiological methods, protein expression, purification and analyses, protein interactions (Biacore), flow cytometry, complement-specific assays, confocal and STORM superresolution microscopy.

General description of your individual PhD-schedule:

- Your main university will be Lund University (Sweden) with Prof. Blom as supervisor.
- You will have a 6-months research secondment at Utrecht University/ University Medical Center Utrecht (Netherlands) with Prof. Rooijackers as supervisor, where you continue to scientifically work on your thesis project.
- You will have a 1-month clinical training at Research Center Borstel Hospital (Borstel, Germany).
- You will have a 1-month entrepreneur training at MSD Finland (Helsinki).
- You will finally receive a PhD issued by Lund University and Utrecht University if you fulfil the respective requirements.

Application

The position is advertised from 10.09.2019 – 10.11.2019 on www.corvos.eu. Please apply via this homepage during that time.