

PhD position (E13 TV-L, 65%) – Host-pathogen interactions and cell biomechanics

to be filled as soon as possible. The position is initially limited to three years.

The Cluster of Excellence “Controlling Microbes to Fight Infections”(CMFI) in the Interfaculty Institute of Microbiology & Infection Medicine (IMIT) at the University of Tübingen is looking to fill one PhD position (E13 TV-L, 65%) as part of Junior Group Leader Dr. Effie Bastounis’ research group. The earliest starting date for this position will be on 20.05.2021. The position is funded for a period of 3 years at least. The available position focuses on using and further developing an organotypic device for applying shear stresses onto host endothelial cells during infection with intracellular bacterial pathogens. The goal is to understand the mechanism whereby fluid shear stresses impact: (1) pathogen adhesion onto host cells; (2) pathogen internalization into host cells; and (3) the ability of the intracellular pathogens to spread from cell to cell.

Specific research project

Endothelial cells that line the inner lumen of our vessels are constantly exposed to shear stresses due to blood flow and are experiencing alterations in the stiffness of the extracellular matrix (ECM) on which they reside ([Bastounis et al., MBoC, 2019](#)). Changes in both these mechanical cues contribute to multiple pathologies including atherosclerosis, and often correlate with increased susceptibility to bacterial infection ([Bastounis et al., Sci Rep, 2018](#)). However, most clinical studies on these correlations lack causality and are rather observational in nature. Using a multi-well impinging flow jet to impart varying shear stresses and gradients into endothelial cells in culture residing on varying stiffness ECMs we will investigate how those alone and in synergy impact direct adhesion and uptake of pathogenic intracellular bacteria, as well as their ability to spread from cell to cell. The goal of the project is to discover how shear flows impact host cell mechanotransduction and tension, thus facilitating or obstructing intracellular bacterial pathogen dissemination through endothelia.

Candidate profile

The ideal candidate preferably brings along a degree that demonstrates an interdisciplinary background in both life and engineering sciences. While a background in host-pathogen interactions, cell biology, microscopy is a plus, a solid background in basic computer programming(e.g. MATLAB, python etc.) and/or image processing is also important to carry out the planned studies and analysis. We are looking for a highly motivated candidate with excellent communication and initiative skills, who is excited to conduct interdisciplinary studies and can team up with the various scientists with whom we are collaborating. We offer work environment that is strongly stimulating with state-of-the-art infrastructure and various facilities (check <https://uni-tuebingen.de/forschung/forschungsschwerpunkte/exzellenzcluster-cmfi/cmfi/>) which will provide the successful applicant with unique opportunities to develop a strong interdisciplinary portfolio in microbiology, microscopy, cell biology and biomechanics.

For further information about the position, please contact Effie Bastounis by e-mail, effie.bastounis@uni-tuebingen.de, and visit our website <https://www.bastounislab.org>. Applications with a short cover/motivation letter, CV/biosketch, diploma(s) and two contacts for references should be sent via email to ebastoun@stanford.edu or office@cmfi.uni-tuebingen.de.

The University aims to increase the proportion of women in research and teaching and urges suitably qualified women scientists to apply. Qualified international researchers are expressly invited to apply. Disabled persons with equal aptitude will be given preferential consideration.