

The **Environmental Microfluidics Group** in the Department of Civil, Environmental and Geomatic Engineering at ETH Zurich, is seeking a dynamic and motivated doctoral student for a project to study the impact of local hydrodynamics on biofilm mechanical properties. The position is funded by a recently awarded [SNSF Prima Grant](#) obtained by Dr. Secchi to start an independent research unit in the Environmental Microfluidics Group.

Doctoral position on “The role of ambient flow in determining the microstructure of the biofilm matrix”

Biofilms are consortia of bacteria that grow on moist surfaces and have major environmental, technological and medical impacts. Within biofilms, bacterial cells are embedded in a matrix of extracellular material, made up of diverse biopolymers, which provides protection against mechanical and chemical insults. Despite the importance of the matrix to biofilm survival and the ubiquity of flow in aquatic habitats, little is known about how ambient flow shapes its characteristics and, in turn, how its characteristics shape the biofilm’s response to environmental conditions. This project will focus on studying the influence of flow and shear stress on biofilm matrix development, using the experimental toolbox from soft matter physics to characterize the matrix and elucidate the relation between rheology and chemical composition. The research will involve setting up and testing a microfluidics platform to measure the rheology of biofilms grown in different geometries and flow conditions. The broad goal of the PhD is to study biofilms from the point of view of soft condensed matter to unravel the role of hydrodynamics in shaping the microstructure and chemical composition of the biofilm matrix, coupling accurate rheological characterization, advanced optical visualization techniques and microfluidics.

The successful candidate will have a strong engineering background, preferably with experience in biophysics and soft matter, and a desire to work experimentally at the interface between soft matter physics and biology. Existing experimental experience is preferred. The candidate will have the opportunity to work in a highly interdisciplinary, cutting-edge environment, to interact with researchers from many different disciplines, to gain skills in a number of engineering approaches, and to learn about fundamental biophysical processes of microorganisms. The ability to work independently, but also to interact and collaborate within a team, will be great assets. The project will be in collaboration with the group of Prof. Jan Vermant (Department of Materials Engineering, ETH).

We look forward to receiving your online application including a CV, full transcripts from undergraduate studies, a brief (1-page) statement of research interests and contact details of 2 referees. Please note that we exclusively accept applications submitted through the ETH online application portal. Applications via email or postal services will not be considered. The position will start as early as 1 November 2018, or as soon as filled.

For questions regarding the position, please contact Dr. Eleonora Secchi by email at secchi@ifu.baug.ethz.ch (no applications).



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