

Biophysical approaches of bacterial biofilms



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第8回 ERATO 学術セミナー

ERATO Nomura project :The 8th Science Seminar

Adherent microbial communities, so called biofilms, are widely spread on earth in living hosts such as animals or plants but also on inert materials such as soil grains or ship hulls. Exhibiting very diverse traits and multiple impacts, they all have in common a three-dimensional architecture in which the confined cells, hold together by an extracellular polymer matrix, acquire specific properties and display significant advantages in comparison with their planktonic counterparts. To unravel the outperforming mechanisms operating in these communities, a better elucidation of the physicochemical landscape prevailing in these organizations is needed.

In our laboratory, we investigate the highly heterogenous distribution of the physical and physico-chemical properties of the biofilm-dwelling cells are subjected to. We design experiments involving living biofilms under flow in microfabricated millifluidic channels. Thereby, we can control and derive key physico-chemical parameters such as shear stress or nutrient advection and diffusion. We aim at real time monitoring of the biofilm properties in situ at the local scale, taking into account the heterogeneity of the material. Our studies range from the very model monospecies biofilm of *Escherichia coli* up to complex natural systems. In this talk, I will give three examples illustrating our approaches and focus on the importance of measuring quantitative descriptors. I will show (1) how we achieved the mapping of biofilm mechanical properties using magnetic tools, (2) our first results on the kinetics of formation of a 4S-species laboratory model biofilm and finish with (3) our current efforts to investigate a river epilithic biofilm using machine learning algorithms. Particularly, I will consider the worth of refining specific tools and insist on the challenge of developing adequate fluorescent labelling for video microscopy investigations of the biofilms.

Seminar
in
English

日時：2018年5月17日(木)

時間：a.m 10:00 ~ a.m 11:30

会場：筑波大学総合研究棟 A 110 室

参加費無料
事前申し込み不要



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JST ERATO Nomura Microbial Community Control Project
<http://www.jst.go.jp/erato/nomura/en>

