Ecomechanics of biofilm

By
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Venue: Perseverance Room, Enterprise Level 5

Abstract

Biofilms are densely populated communities of microbial cells protected and held together by a matrix of extracellular polymeric substances (EPS). EPS is a crosslinked viscoelastic secretion that holds the biofilm together and accounts for 50-90% of the total organic matter in the biofilms. It is largely composed of polysaccharides, protein, nucleic acids, lipids and bacterial surface appendages. Biofilms are pervasive in health care settings, water purification plants, ship hulls etc. The presence of EPS makes the biofilm resistant to antibiotics. *P. aeruginosa* synthesizes at least three main exopolysaccharides: Alginate, Pel and Psl. Pel and Psl which are known to play an important role in biofilm formation and knocking out of one of them could affect the formation of biofilms. Using particle tracking microrheology, we have shown that these polysaccharides plays distinct role in the formation of biofilm. Together with this work, I will be presenting some of the current work that is being carried out to study the mechanics of biofilm.

Short Biography

Dr. Binu Kundukad is currently a postdoctoral associate in BioSystems and Micromechanics Inter-Disciplinary Research Group of Singapore-MIT Alliance for Research and Technology (SMART). She received Ph.D from the Department of Physics, National University of Singapore (NUS) in 2010. She is interested in applying physics principles and techniques to study biological systems. She has used techiques like particle tracking microrheolgy, AFM imaging, force spectroscopy and nano/ microfabicated tools to study various biological systems like understanding the mechanism of topoisomerase II targeting anti cancer drugs, studying the DNA dynamics, DNA-Protein interactions and biofilms. These works have been published in reputable peer reviewed journals.