Singapore-MIT Alliance for Research and Technology

BIOSYSTEMS AND MICROMECHANICS

From Biomolecules to Biofilms

Focused Seminar Series on Biomolecules and Biofilms

11 April — 6 June 2016, Level 5 Seminar Room, Enterprise Wing @ UTown, S'138602

Seminar 3: Mechanical response of biofilm associated proteins

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Singapore MIT Alliance for Research and Technology

Date: 25 April 2016, Monday

Time: 4pm to 5pm

Venue: Perseverance Room, Enterprise Wing Level 5 @ UTown

Abstract

Most of the bacterial species form biofilms. There are three main components in the biofilm, they are extracellular polymeric substance, secondary messaging system and surface proteins. The sequences of the surface proteins are conserved across the bacterial kingdom. Although the function of these proteins is not completely understood. I am interested in a protein BapA (386-kDa) from Salmonella. In this work, the mechanical stability of the BapA domains was studied for the first time by manipulating single protein constructs each containing several BapA domains using magnetic tweezers. We find that BapA domains have diverse mechanical stability. Importantly, many of these domains are calcium sensitive, stabilised by calcium binding. As BapA has been suggested to involve in Salmonella invasion that requires calcium, and as it is likely a crucial mechanical component of biofilms, these results provide several novel insights into the potential roles of BapA as a structural maintenance component of Salmonella biofilm and also Salmonella invasion. I will share some of the new findings in this presentation.

Biography

Dr. Durgarao Guttula is currently a postdoctoral associate in BioSystems and Micromechanics Interdisciplinary Research Group of Singapore-MIT Alliance for Research and Technology (SMART). He received a master's degree from Banaras Hindu University (IIT-BHU) from India, followed by a Ph.D. from the Department of Physics, National University of Singapore (NUS) in 2014. He is interested in mechanosensing behaviour of biomolecules using force spectroscopy. He uses techniques like magnetic tweezers and AFM to study biofilm mechanics.