



The Faculty of Biotechnology and Food Engineering

Seminar

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How do bacteria adapt to plants and outcompete other bacteria in the plant environment?

Abstract

The plant environment is teeming with microbes that are attracted to the rich nutrients exuded by the plant host. Bacteria have evolved various molecular mechanisms to colonize plants and to outcompete other microbes in this highly occupied niche. However, there is a little understanding of the identity of these molecular mechanisms. We focus in the lab on discovery of new mechanisms that play a role in microbial interactions with plants and microbes. In the first part of the talk, I will describe our approach to address the question of how bacteria adapted to plants. We developed a comparative genomics method to identify genes that are enriched in plant-associated bacteria based on comparison of 4,000 genomes. This approach has led to an improved understanding of how bacteria associate with plants. In the second part of the talk, I will focus on inter-microbial warfare in the plant environment. We study two bacterial protein secretion systems that are commonly employed by members of the plant microbiome named the Type 6 Secretion System (T6SS) and the extracellular contractile injection system (eCIS). We developed computational algorithms to predict novel antibacterial proteins secreted by each of the secretion systems. We scanned genomes of plant-associated bacteria to predict the genes encoding these antibacterial proteins. We then validated the antimicrobial activity of 14 new proteins. Our results shed light on new mechanisms using which bacteria gain a selective advantage in the plant environment. Harnessing these mechanisms in different agricultural settings can lead to efficient, sustainable biological control strategies against pathogens.

Wednesday, 1/1/20, 14:00 – 15:00, Room 300

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