



Department of Molecular and Cellular Biology

## SEMINAR

# **“Divide and conquer” control of SagS in the regulation of biofilm formation and biofilm tolerance**

Presented by:

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**TIME:** 2:00 p.m.

The opportunistic pathogen *Pseudomonas aeruginosa* forms mature biofilms that are tolerant to antimicrobial agents. Biofilm formation occurs in a regulated and stage-specific manner, with biofilm development requiring at least four two-component regulatory systems, namely SagS, BfiRS, BfmRS, and MifRS. Together, these systems form a coordinated signaling network that regulates three committed steps at the later developmental stages of the *P. aeruginosa* biofilm life cycle, namely the transitions to initiation of biofilm formation, biofilm maturation, and microcolony formation. Central to the biofilm developmental process is the sensor-regulator hybrid SagS, which acts as a molecular switch regulating *P. aeruginosa* biofilm formation and biofilm resistance, by (i) activating BfiSR to enable biofilm development and by (ii) activating BrlR to render surface-associated bacterial cells significantly more resistant to antimicrobial agents compared to planktonic cells. To elucidate factors contributing to the dual function of SagS, the role of SagS domains was determined. The findings revealed SagS having modular “divide and conquer” functions, with SagS and its distinct domains regulating *P. aeruginosa* biofilm formation and biofilm resistance via two independent signaling networks.

*Dr. Sauer is the External Examiner for the PhD defence of Véronique Taylor.*