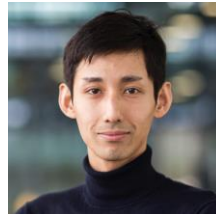


CONFÉRENCE

Conférence prononcée par **Dr. Shuaiqi Guo**



Jeudi 16 novembre 2023 à 11h30

Université de Montréal, Pavillon Roger-Gaudry (B)
2900 boul. Édouard Montpetit (Chemin de la tour) Montréal, QC H3T 1J4
Salle : N-833

Dr. Shuaiqi Guo

Understanding the molecular basis of microbial adhesion and biofilm formation

Abstract: The rise of antimicrobial drug resistance poses a significant threat to global health and calls for urgent novel therapeutic strategies. I will present an integrative approach combining multi-scale imaging, biochemistry, and genetics to investigate key macromolecular complexes involved in secretion, adhesion, and biofilm formation in pathogenic and non-pathogenic bacteria. Structural and biophysical studies establish that a 1.5-MDa adhesin of the Antarctic bacterium *Marinomonas primoryensis* accesses oxygen and nutrients using over 130 domains to form symbiotic multispecies biofilms with microalgae on ice. In addition, cryo-focused-ion-beam (cryo-FIB) milling and cryo-electron tomography (cryo-ET) imaging reveal that the model pathogen *Vibrio cholerae*, the causative agent of cholera, employs a 2251-aa adhesin as a 'double-sided tape' to bind human red-blood cells into large clumps, forming biofilms for efficient host colonization. Finally, molecular modelling and cryo-ET with subtomogram averaging show the *in situ* molecular architecture of type IV pili machinery in the series human pathogen *Pseudomonas aeruginosa*, a virulence factor crucial in twitching motility, adhesion, and biofilm formation. Our work lays an interdisciplinary foundation for fascinating long-term studies of the molecular basis of microbial pathogenesis across diverse species as well as for the development of new antimicrobial strategies.

References:

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