

CONFÉRENCE

Conférence prononcée par [Fabrice Jean-Pierre, PhD.](#)



Jeudi 08 décembre 2022 à 11h30

Université de Montréal, Pavillon Roger-Gaudry (B)
2900 boul. Édouard Montpetit (Chemin de la tour) Montréal, QC H3T 1J4
Salle : N-524-3

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Modeling microbial interactions in the cystic fibrosis lung

Résumé: A decline in the development and commercialization of new antibiotics, combined with an increase in antimicrobial resistance (AMR) and tolerance (collectively called “recalcitrance”), now represent major threats for the treatment of resilient microbial-based human infections. Supporting that, reports dating as early as in the 1970’s indicate that bacteria show altered antimicrobial sensitivity when grown in a multispecies environment versus monoculture. However, while polymicrobial biofilm-like communities have the capacity to drive chronic infections in diseases such as periodontitis, cystic fibrosis (CF), diabetic foot ulcers, and often worsen clinical outcomes, it is still unclear how interspecies interactions impact microbial drug responsiveness in polymicrobial communities exhibiting recalcitrance. For example, studies have reported that interactions between *Pseudomonas aeruginosa* and *Staphylococcus aureus*, two notable pathogens in CF lung disease, can impact the antimicrobial efficacy of the front-line CF drug vancomycin. However, a knowledge gap remains in our mechanistic understanding of how interspecies interactions within polymicrobial communities modulate drug efficacy and exacerbate CF lung disease. In my work, I have built and validated an *in vitro* polymicrobial community composed of four pathogens that are abundant and prevalent in the CF airway. I have used this novel model to probe the mechanisms by which microbes in my system show altered sensitivity towards the most clinically used front-line CF drug, that is, tobramycin. These findings and approaches have the potential to not only provide us with new mechanistic knowledge of how microbial interactions impact drug efficacy, but also identify novel targets to treat such recalcitrant, biofilm-like polymicrobial communities observed in people with cystic fibrosis.

INVITÉ PAR

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