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OMNI
One Health Modelling Network for Emerging Infections

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OMNI-RÉUNIS Super-Spreader Seminar Series

This seminar series is intended to provide OMNI-RÉUNIS HQPs a platform to present their research, promote their ideas, share their research experiences, and establish connections among the various branches of the network.

This seminar will be hosted via Zoom
on Thursday, April 20, 2023, from 11:00-12:00 EST.

Register here and join us!

SEMINAR 11
MATHEMATICAL MODELLING TO IDENTIFY OPTIMAL DOSING SCHEDULES: FROM CHEMOTHERAPY TO COVID-19 VACCINES

PRESENTER- DR. SUZAN FARHANG-SARDROODI

Dr. Suzan Farhang-Sardroodi is a physicist with a doctorate in evolutionary graph theory and a post-doctorate in disease computational and mathematical modelling. She is currently a senior postdoctoral researcher in the Department of Mathematics at the University of Manitoba. Her research interests include Computational Biology, Cancer, Immunology, Pharmacology (QSP) and machine learning. During the COVID-19 pandemic, she has led some projects investigating the human immune response post-infection or vaccination.

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ABSTRACT

PRESENTER- DR. SUZAN FARHANG-SARDROODI

In this seminar, I will first present our mathematical model developed in the context of cancer chemotherapy to define an optimal treatment schedule that reduces tumour burden while also maintaining lean muscle mass. Although chemotherapy is the most common cancer treatment, it has significant side effects, including muscle atrophy. Preservation of body composition, in addition to consideration of inflammation and immune interactions, the gut microbiome, and other systemic health measures, may lead to improved patient-specific treatment plans that improve patient quality of life. Next, I will discuss recent work focused on using mathematical modelling to identify biological and COVID-19 vaccine characteristics that may allow for heightened and longer-lasting immune responses. Here, we focused on the optimal timing of second doses as supply chain logistics hampered initial global vaccine delivery, which is impacted mass vaccination strategies during the early phases of mass vaccination in the COVID-19 pandemic. I will present our study which aimed to predict the impact of different prime-boost schedules by quantifying their effects on immunological outcomes based on a simple system of ordinary differential equations.

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