MODELING THE HUMORAL IMMUNE RESPONSE TO SARS-COV-2 AND APPLYING MACHINE LEARNING TO DIFFERENTIATE COVID-19 FROM INFLUENZA

BGSA Seminar Series with
Dr. Suzan Farhang-Sardroodi,
University of Toronto

Nov. 22, 1pm in CSF-1302

Join Virtually!

"Computational modelling and machine learning (ML) are essential for understanding bio- logical systems and complex diseases. Mechanistic model simulations (MMs) explore biological behaviour by simulating systems based on known mechanisms. However, combining MMs with ML overcomes their limitations, enabling virtual patient data generation and deeper insights into disease dynamics."

"In this seminar, I present a study on modeling humoral immunity to SARS-CoV-2 and differentiating COVID-19 from influenza using ML. First, a mathematical model simulates B cell dynamics in response to SARS-CoV-2, tracking primary and secondary infection responses and predicting antibody production for the Wuhan and Omicron variants. The results highlight reduced neutralization against Omicron and an enhanced secondary response. Second, ML trained on synthetic data effectively distinguishes COVID-19 from influenza, with viral load and infected cells as key features. This approach demonstrates the potential of MMs and ML to enhance immune response insights and predictive clinical tools."

Bring your own mug for Coffee,
snacks provided!

BGSA