

HSCI SPECIAL SEMINAR SCHOOL OF HEALTH SCIENCES

“Predicting Biological Responses with Machine Learning and Ultrafast Proteomics”

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Monday, December 9, 2019

MJIS 1083

9:00 – 10:00 a.m.

Abstract: Billions of dollars are spent every year on testing the biological effects of chemicals, including toxicity and drug efficacy. Machine learning methods promise to make toxicity testing and drug discovery faster and cheaper. Despite exponential growth in machine learning technology resulting in superhuman performance across multiple application domains, we continue to wait for a breakthrough in universal chemical effect prediction. To fill this gap in knowledge, I developed a new paradigm in computational biochemistry called Molecular Effect Prediction (MoEPred) that will enable prediction of biological states induced by any chemical. In parallel, I built a companion method for ultrafast proteomic analysis that enables the mountain of biological omic data collection necessary to train MoEPred models. Finally, I will discuss how I envision applying MoEPred and fast omic analysis for prediction of neurotoxicity and mechanisms of neuropathology relevant to Alzheimer's disease.