



PHYSICS AND ASTRONOMY COLLOQUIUM

Dr. David A. Jaffray

University of Toronto

“The Future of Cancer Medicine: Personal or Industrial?”

Abstract

Our characterization of cancer is advancing rapidly through the ever-increasing ability to make quantitative measurements of the cancerous tissues with new tools and technologies. These include continuously improving methods of sequencing the genome, advances in imaging that allow us to non-invasively characterize the biology of the disease in-situ, and the potential to integrate circulating biomarkers of response. The myriad of new signals that characterize the complex biology of cancer is compounded by the diversity of the human form. Characterizing the human ‘phenome’ – the detailed description of the patient and their biological state – is becoming critical for accurate prediction of clinical outcomes of a given therapy and is associated with the development of ‘precision’ or ‘personalized’ cancer medicines. Furthermore, the myriad of inputs to the decision-making process is challenging the capabilities of our human cognition and the healthcare system in general to deliver the new complex treatments with precision required to realize the potential of these personalized therapies. Taken together, the traditional model of cancer medicine needs to be transformed from a fairly ad-hoc process of assessment, diagnosis, and treatment into something far more coordinated. Therein lies the paradox that ‘medicine must industrialize to personalize care’. Just as automation has allowed manufacturing to deliver highly customized products at scale, so to must medicine. The implications are important across all of cancer medicine and align with the need for improvements in patient safety, quality of care, clinical outcomes, and patient experience. The development of digital technologies will allow this transformation to occur and if properly implemented, will not only advance care, but will also accelerate the pace of scientific discoveries required to make real progress against this disease.

Wednesday, November 28, 2018

3:30 p.m.

Bob Wright Centre Building Room A104