THE UNIVERSITY
OF BRITISH COLUMBIA

Michael Smith Laboratories

presents a seminar by

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Digital Integration and Predictive Technologies
Amgen Inc., Cambridge MA, USA

Friday, August 2nd at 10:00 am
MSL Auditorium – 2185 East Mall

Advances in real-time monitoring and control of industrial cell culture processes: dealing with small data in the era of big data

Biotechnology-based products have been gaining increasing visibility and success in treating chronic diseases, such as arthritis, diabetes, and cancer. A recent report by the US-FDA states that over 40% of all pharmaceutical R&D/pipelines are now biopharmaceuticals rather than drugs. A commercial-scale biopharmaceutical process is typically operated as a batch/fed-batch process and includes multiple unit operations, such as bioreactors, harvesting, and purification. Under the Quality by Design (QbD) paradigm, real-time process monitoring, and advanced process control platforms play critical roles to ensure that the quality targets are met and the products conform to their quality specifications. Despite the industry-wide effort to push towards Industry 4.0, biomanufacturing suffers from a unique challenge - the “Low-N" problem or the “small" data problem. In this talk, I will discuss the Low-N issue and highlight the adverse effects of Low-N on the performance of the industrial monitoring and control platforms. I will also talk about new data analytics and machine-learning solutions we are developing at Amgen to address the small data problem. We will focus on two specific applications - real-time multivariate statistical process monitoring and Raman spectroscopy-based soft-sensor model development for industrial cell-culture processes.

Hosted by Dr. James Piret (james.piret@ubc.ca)