



Mathematical Biology Seminar



Monday, October 29, 2018

3 pm – 457 CAB

Chris Frei

University of Alberta

A Stochastic Model for Cancer Metastasis: Branching Stochastic Process with Settlement

We introduce a new stochastic model for metastatic growth, which takes the form of a branching stochastic process with settlement. The moving particles are interpreted as clusters of cancer cells while stationary particles correspond to micro-tumors and metastases. The analysis of expected particle location, their locational variance, the furthest particle distribution, and the extinction probability leads to a common type of differential equation, namely, a non-local integro-differential equation with distributed delay. The solutions' asymptotic behavior for long time is characterized by an explicit index, the metastatic reproduction number, which distinguishes between exponential growth and eventual extinction. The talk is based on joint work with Thomas Hillen and Adam Rhodes.