

**RYERSON UNIVERSITY
DEPARTMENT OF MATHEMATICS
BIOMATHEMATICS & FLUIDS SEMINAR**

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Date: Thursday, March 27, 2014
Time: 11:10am
Location: ENG 210

**Finite State Machine Modeling of MAPK
Signaling Pathways**

Abstract:

Mitogen activated protein kinase (MAPK) signaling pathways are frequently deregulated in human cancers, with potential involvement in most if not all cellular processes leading to tumorigenesis. Models of reaction kinetics are often used to study pathway deregulation dynamics and their nonlinear effects on cell fate and carcinogenesis. However, the relevant reaction rates needed for these models are often estimated from sparse experimental data, if at all available, or curated from various literature sources which undoubtedly made use of different measurement protocols. As an alternative to kinetics based modeling, a finite state machine approach is explored to approximate the temporal dynamics of cellular signal transduction. The emphasis of the approximation is the model integration of cellular signaling and key determinants of the cellular context, including the cell cycle and the transcription regulatory network. This is expected to yield a more comprehensive understanding of the cause-effect dynamics linking deregulated signaling pathways and cancer - with potential implications for the discovery of more effective cancer drugs

ALL FACULTY, STAFF, STUDENTS AND GUESTS ARE WELCOME TO ATTEND