

# Disease Dynamics 2008

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University of British Columbia, Vancouver

Sponsored by PIMS: the Pacific Institute for Mathematical Sciences and  
MITACS: the Mathematics of Information Technology and Complex Systems  
Network of Centres of Excellence

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Thursday, April 3rd

2:00pm Registration open at PIMS (downstairs); Tea and coffee.

3:00pm Welcome and opening remarks

3:10pm Sally Blower, University of California - Los Angeles

*Sex & HIV prevention: when is it better to be a man?*

4:10pm David Earn, McMaster University

*The Great Plague of London*

5:00pm Poster session (refreshments will be served)

+ Alexander Lange, McMaster University: *How intra host traits are determined by inter host dynamics - an evolutionary approach to the emergence of infectious diseases of multi-strain pathogens.*

+ Joel Miller, BC Centre for Disease Control: *The impact of clustering on disease spread.*

+ Stewart Chang, University of British Columbia: *A model for Mycobacterium tuberculosis infection.*

+ Omer Dushek, University of British Columbia: *Analysis of serial engagements of T cell receptors in signaling clusters.*

+ Jennifer Hubbarde, University of British Columbia: *A Burst-Death Model for Experimental Evolution.*

+ Ozge Karanfil, Simon Fraser University: *A Mathematical Model of Steady State B Lymphopoiesis in Mouse and Rat Bone Marrow.*

+ Azamed Gezahagne, East Tennessee State University: *Analyzing the Impact of Risk Behavior on ARV drug resistance.*

+ Abdessamed Tridane, Arizona State University: *A Viral Load-Based Cellular Automata Approach to Modeling HIV Dynamics and Drug Treatment.*

+ Zahid Shareef, University of the West of England: *Mathematical Modelling of Non-local Effects in Infectious Diseases.*

+ Eunha Shim, Yale University: *Antiviral intervention during pandemic influenza: prophylaxis and treatment coverage levels driven by individual and societal interest.*

+ Samuel Alizon, Queen's University: *Transmission-recovery trade-offs to study parasite evolution.*

+ Anuj Mubayi, Arizona State University: *On the Role of Environmental Context on the Dynamics of Alcohol Use.*

+ Vahid Dabbaghian, Simon Fraser University: *A Cellular Automata Model of the Spread of HIV in a Community of Injection Drug Users.*

6.15pm End of poster session

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**Friday, April 4th**

**8.30am Breakfast at PIMS**

**9.00am Jane Heffernan**, York University

*HIV Variability and Resistance in Drug Therapy*

**9.35am Timothy Reluga**, Penn State University

*Behavior, Immunity, and Bistability in Simple Epidemiology Models*

**10.10am Coffee/tea break**

**10.30am Fred Brauer**, University of British Columbia

*Age of Infection Epidemic Models*

**11.05am Troy Day**, Queen's University

*Modeling The Evolutionary Biology of Autoimmune Disease*

**11.40am Focused discussions: Session 1**

Samuel Alizon (Queen's): Linking within-host and epidemiological dynamics: is it worth it?

Malcolm Steinberg (BCCDC): Issues surrounding the spread of HIV.

Joel Miller (BCCDC): Vaccinating against mosquitoes to control malaria

**12.30pm Lunch break**

**1.40pm Eric Arts**, Case Western Reserve University

*A defined role for mathematical models to test possible causal relationships of ex vivo HIV-1 phenotypic parameters on disease progression and global spread of the epidemic*

**2.15pm Maarten Boerlijst**, University of Amsterdam

*Spatial Epidemics: Emergent Trade-offs and Evolutionary Cycling*

**2.50pm Coffee/tea break**

**3.05pm Rustom Antia**, Emory University

*On the role of the innate immune response in regulating the within-host dynamics of malaria infections*

**3.40pm Focused discussions: Session 2**

Alexander Lange (McMaster): What are the limitations when describing viral evolution and epidemiology based on mathematical models?

Eunha Shim (Yale): How to incorporate vaccine efficacy into mathematical models.

Further discussion leaders: Sally Blower, Troy Day

**4.45pm Coffee/tea break**

**5.00pm Focused discussions: Reports back on Sessions 1 and 2**

Moderator: Dan Coombs

**7pm Dinner - Maurya restaurant, 1643 West Broadway.**

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**Saturday, April 5**

**9.00am Breakfast at PIMS**

**9.15am Babak Pourbohloul**, BC Centre for Disease Control

*Time Evolution of Disease Spread on Networks*

**9.50am Yang Yang**, Fred Hutchinson Cancer Research Center

*A Bayesian Framework for Estimating Vaccine Efficacy per Infectious Contact*

**10.25am Coffee/tea break**

**10.40am Focused discussions: Session 3**

Babak Pourbohloul (BCCDC): Models of epidemics, epidemic of models: Does every model have direct implications in public health policy design?

Further discussion leaders: Junling Ma, Pauline van den Driessche, Michael Gilchrist

**11.30am Focused discussions: Final report back**

Moderators: Dan Coombs, Pauline van den Driessche

**12pm End of Meeting**



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