



Frontiers in Biophysics

June 16, 2017

LSC 3, Life Sciences Centre
The University of British Columbia

Schedule and Program

8:45 - 9:30	Registration & poster set-up	
9:30 - 11:30	Talk session 1	
11:35 - 12:35	Keynote talk: Jagesh Shah How do migrating cells measure?	
12:35 - 1:35	Lunch	Boxed lunches
1:35 - 3:20	Talk session 2	
3:30 - 4:45	Poster session	Cookies, coffee & tea

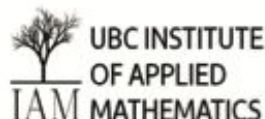
Keynote talk: How do migrating cells measure?
Jagesh Shah (Harvard Medical School)

Orientation of motile cells in chemical gradients, or chemotaxis, plays a critical role in the survival of single-celled organisms and the development and immune function of multicellular organisms. While an abundance of molecules modulating chemotaxis have been identified, measuring their dynamical behavior to explain how cells become oriented has been far more challenging. Microfabricated devices, with features the size of single cells, permit quantitative programming of chemical and physical cues in space and time to connect experimental results to computational models. Using these devices we have identified a novel inputs into cell orientation such as hydraulic resistance and memory that belie a complex measurement scheme at play in migrating cells that goes beyond chemical cues and includes physical inputs and past history. We will describe these findings and our current efforts to develop in an integrated quantitative model of how migrating cells measure.

Location: LSC 3 & West Atrium, Life Sciences Centre, UBC
<https://goo.gl/maps/NCBAG3m65H2>



Department of
Mathematics



THE UNIVERSITY
OF BRITISH COLUMBIA
Microbiology and Immunology

Note: All talks are 15 minutes long, including time for questions. Plan on speaking for 13-14 minutes to leave 1-2 minutes for questions at the end.

Talk session 1

- 9:30 - 9:45 **Clinton Durney** (UBC Mathematics)
A Mechanochemical Model of Drosophila Dorsal Closure
- 9:45 - 10:00 **Alan Manning** (UBC Physics)
A complete picture of nuclear spin relaxation in brain? Microstructures, myelin, and a cow brain from Michigan
- 10:00 - 10:15 **David Holloway** (BCIT Mathematics)
Two-stage patterning dynamics in conifer cotyledon whorl morphogenesis
- 10:15 - 10:30 **Lavisha Jindal** (SFU Physics)
Plasmid Segregation by the ParA/B protein system
- 10:30 - 10:45 **Alexandra Kaspar** (SFU Physics)
Energy-Speed-Accuracy Tradeoffs in Driven Stochastic Rotary Machines
- 10:45 - 11:00 **Joshua Scurll** (UBC Mathematics)
StormGraph: A graph-based clustering algorithm for the analysis of super-resolution microscopy data
- 11:00 - 11:15 **Alastair Jamieson-Lane** (UBC Mathematics)
Bi-molecular reaction rates in 2d chemistry
- 11:15 - 11:30 **Lisa Zhang** (SFU Physics)
Observation of the Markovian Mpemba Effect

Keynote talk

- 11:35 - 12:35 **Jagesh Shah** (Harvard Medical School)
How do motile cells measure?

Talk session 2

- 1:35 - 1:50 **Aidan Brown** (SFU Physics)
Allocating dissipation across a molecular machine cycle to maximize flux

- 1:50 - 2:05 **Luke McAlary** (UBC Physics)
Tryptophan-32 of SOD1 is an aggregation modulating residue
- 2:05 - 2:20 **Daniel Knowles** (SFU Molecular Biology and Biochemistry)
A conserved linker in CTP: Phosphocholine cytidyltransferase transduces activating signals between regulatory and catalytic domains
- 2:20 - 2:35 **Alejandra Herrera Reyes** (UBC Mathematics)
Counting individual fluorophores in STORM data
- 2:35 - 2:50 **Mike Kirkness** (SFU Molecular Biology and Biochemistry)
Accessible high-throughput force studies: enzymatic cleavage of collagen
- 2:50 - 3:05 **Michael Irvine** (UBC Mathematics)
Conservation of pattern as a tool for inference on spatial snapshots in ecological data
- 3:05 - 3:20 **Samara Pillay** (Mathematical Institute, University of Oxford)
Multiscale Modeling of Angiogenesis

Poster session (3:30 - 4:45)

- Elham Abouei** (UBC Physics)
Azimuthal enface image registration for correction of motion artifacts in rotary-pullback 2D and 3D image modalities
- Beverlie Baquir** (UBC Microbiology and Immunology)
Exploring the Role of Cellular Reprogramming During Sepsis
- Zarrin Basharat** (Fatima Jinnah Women University & UBC Molecular Biology and Biochemistry)
Deciphering bacterial mechanism of azo dye degradation through computational biology approach
- Bashe Bashe** (SFU Molecular Biology and Biochemistry)
Determination of Lipid Phase Behaviour in Drug Delivery Systems via Small Angle X-Ray Scattering
- Dhananjay Bhaskar & Cole Zmurchok** (UBC Mathematics)
A model for Rho GTPase dynamics in epithelial monolayers

Darren Christy (UBC Medicine)

CNS-Derived Extracellular Vesicles are Heterogeneous and Tissue Specific

Matt Courtemanche (SFU Physics)

Detecting interhemispheric transfer using magnetoencephalography

Lisa Craig (SFU Molecular Biology and Biochemistry)

Structures of Type IV pili from *Pseudomonas aeruginosa*, *Neisseria gonorrhoeae* and *Neisseria meningitidis* at sub-nanometer resolution

Navi Garcha (SFU Molecular Biology and Biochemistry)

Localization and Assembly of the *Vibrio cholerae* Type IV Pilus Secretin Channel

Ismail Khater (SFU Computer Science)

Molecular Level Quantification of Cav1 Clusters in Super-Resolution Imaging Data

Emma Lathouwers (SFU Physics)

The thermodynamics of living things: energy and information transmission in soft, noisy matter

Aaron Lyons (SFU Physics)

Probing the Structural and Mechanical Properties of Molecular Collagen

Joanne Mercer (SFU Physics)

Investigating the Phase Behaviour of a Model Lipid Nanoparticle System with DLinKC2-DMA/Distearoylphosphatidylserine and the Addition of Cholesterol

Shawan Narayan (UBC Physics)

Investigating the behaviour of a square quadrupole system

Karlton Scheu (SFU Physics)

Investigating a biological specificity conundrum: the role of dynamics in transcription factor binding

Alaa Al-Shaer (SFU Physics)

Probing the Structural and Mechanical Properties of Molecular Collagen

Reza Siavashi (SFU Physics)

Gel/Liquid-ordered Phase Coexistence in Bilayers Containing Palmitoyl Sphingomyelin, Palmitoyl Ceramide and Cholesterol

Martin Zuckermann (SFU Physics)

Transforming a Protein Nano-walker into a Nano-motor by Feedback