



Banff International Research Station

for Mathematical Innovation and Discovery

Imaging, Interpretation and Modeling in Modern Immunology

April 10-15, 2011

MEALS

*Breakfast (Buffet): 7:00–9:30 am, Sally Borden Building, Monday–Friday

*Lunch (Buffet): 11:30 am–1:30 pm, Sally Borden Building, Monday–Friday

*Dinner (Buffet): 5:30–7:30 pm, Sally Borden Building, Sunday–Thursday

Coffee Breaks: As per daily schedule, 2nd floor lounge, Corbett Hall

***Please remember to scan your meal card at the host/hostess station in the dining room for each meal.**

MEETING ROOMS

All lectures will be held in Max Bell 159 (Max Bell Building accessible by walkway on 2nd floor of Corbett Hall). LCD projector, overhead projectors and blackboards are available for presentations. Note that the meeting space designated for BIRS is the lower level of Max Bell, Rooms 155–159. Please respect that all other space has been contracted to other Banff Centre guests, including any Food and Beverage in those areas.

SCHEDULE

Sunday

- 16:00** Check-in begins (Front Desk - Professional Development Centre - open 24 hours)
- 17:30–19:30** Dinner, Sally Borden Building
- 20:00** Welcoming and organizational remarks, Max Bell 159
- 20:10** Plenary lecture: *Michael Dustin (New York University)*
- 21:00** Informal gathering in 2nd floor lounge, Corbett Hall

Monday

- 7:00–8:45** Breakfast
- 8:45–9:00** Introduction and Welcome by BIRS Station Manager
- 9:00–12:00** Session 1, Max Bell 159
- 10:30** Coffee Break, 2nd floor lounge, Corbett Hall
- 12:00–13:00** Lunch
- 13:00–14:00** Guided Tour of The Banff Centre; meet in the 2nd floor lounge, Corbett Hall
- 14:00–14:10** Group Photo; meet on the front steps of Corbett Hall
- 17:30–19:30** Dinner
- 19:30–22:00** Session 2, Max Bell 159

Tuesday

7:00–9:00	Breakfast
9:00-12:30	Session 3
10:30	Coffee Break
12:30–13:30	Lunch
13:30-17:00	Session 4
15:00	Coffee Break
17:30–19:30	Dinner

Wednesday

7:00–9:00	Breakfast
9:00-12:30	Session 5
10:30	Coffee Break
12:30	Lunch
17:30–19:30	Dinner
19:30–22:00	Session 6

Thursday

7:00–9:00	Breakfast
9:00-12:30	Session 7
10:30	Coffee Break
12:30	Lunch
17:30–19:30	Dinner
19:30–22:00	Session 8

Friday

7:00–9:00	Breakfast
9:00-11:30	Session 9
10:30	Coffee Break
11:30	Closing discussion and wrap-up
12:00–13:30	Lunch
Checkout by 12 noon.	

** 5-day workshops are welcome to use BIRS facilities (2nd Floor Lounge, Max Bell Meeting Rooms, Reading Room) until 3 pm on Friday, although participants are still required to checkout of the guest rooms by 12 noon. **

SESSIONS

Session 0 (1h)	Sunday 20:00	Plenary
	Michael Dustin	Title TBA
Session 1 (2.5h)	Monday 8:45	Two-photon microscopy: experiment and analysis Chair: Rob de Boer
	Mark Miller	Two-photon microscopy and modeling cellular mechanisms of antigen recognition
	Joost Beltman	Analysing immune cell migration
	Johannes Textor	Defining the quantitative limits of intravital two-photon lymphocyte tracking
	<i>Discussion:</i>	What do we really want to know about immune cell migration, and has modelling helped?
	Organizers:	Rob de Boer and Ton Schumacher
Session 2 (2.5h)	Monday 19:30	Spatial Organization and Cell Signaling I Chair: Rajat Varma
	Ken Jacobson	Mysteries of C-type lectin plasma membrane domains in dendritic cells
	Facundo Batista	Title TBA.
	Spencer Freeman and Michael Gold	B cell talk (title TBA)
	Rajat Varma	Brief introduction to analysis of TCR microclusters
	<i>Discussion:</i>	Experimental and computational analysis of immune receptor clustering.
	Organizers:	Rajat Varma and Subhadip Raychaudhuri.
Session 3 (3h)	Tuesday 9:00	Receptor – ligand kinetics and receptor signaling Chair: Byron Goldstein
	Veronika Zarnitsyna	Beyond adhesion: TCR-pMHC interaction kinetics, dynamics and memory.
	Anton van der Merwe and Omer Dushek	Kinetic-segregation in immunoreceptors.
	Subhadip Raychaudhuri	How B cells discriminate antigen affinity over five orders of magnitude.
	Carmen Molina-Paris	Time is precious for T cells, what do T cell receptors measure equilibrium properties or stochastic events?
	<i>Discussion:</i>	Evidence for and against the Kinetic-Segregation Model of Immune Receptor Signaling.
	Organizers:	Anton van der Merwe and Dan Davis.
	<i>Discussion:</i>	Where do we go with 2D and 3D kinetic rates for signaling?
	Organizers:	Dan Coombs and Carmen Molina-Paris

Session 4 (2.5h)	Tuesday 13:30	Spatial Organization and Cell Signaling II Chair: Christopher Cairo
	Jayajit Das	Competing Negative and Positive Feedbacks Generate Specific T Cell Responses by Tuning Duration and Amplitude of Itk Activation.
	Nicholas Destainville	Role of long-range protein-protein forces in the formation of membrane nanodomains.
	James Faeder	Logical modeling of peripheral T cell differentiation
	Salvatore Valitutti	Human CTL function in health and disease
	<i>Discussion:</i>	Multiple scales of CTL dynamics
	Organizers:	Salvatore Valitutti and Rob de Boer

Session 5 (3h)	Weds 9:00	Single Particle Tracking Chair: Dan Coombs
	Michael Saxton	What needs to be done in single-particle tracking interpretation.
	Raibatak Das	Hidden Markov Analysis of Single Particle Tracking Data.
	Christopher Cairo	Identifying nanoscale receptor confinement using single particle tracking and first-passage time analysis.
	Gerda de Vries	Analysis of molecular diffusion by first-passage time variance identifies the size of confinement zones
	<i>Discussion:</i>	What needs to be done next in single-particle tracking interpretation? What tools do we need? What do experimentalists need modelers and theorists to do?
	Organizers:	Raibatak Das, Nigel Burroughs and Michael Saxton.

Session 6 (2.5h)	Weds 19:30	Two-photon: experiment and analysis II Chair: TBA
	Michael Meyer-Hermann	Synergy of mathematical prediction and multi-photon imaging of B cell homing and selection
	Ton Schumacher	Subtle directional migration of cytotoxic T cells allows efficient target localization
	Silvia Ariotti	Skin patrol by tissue-resident memory T cells
	<i>Discussion:</i>	How can we understand the mode of lymphocyte migration from multi-photon imaging data: The problem of eternal random walk.
	Organizers:	Michael Meyer-Hermann and Johannes Textor.

Session 7 (3h)	Thurs 9:00	Two-photon: experiment and analysis III Chair: Mark Miller
	Gur Yaari and Steven Kleinstein	Method development and analysis of intravital two-photon data from the germinal center response
	Grant Lythe	Diffusive lymphocyte movement and interactions, in silico and in vivo
	Frederik Graw	Influence of the fibroblastic reticular network on cell-cell interactions in lymphoid organs
	Thomas Kepler	Statistical methods for 3+1D leukocyte migration
	<i>Discussion:</i> Organizers:	Emergent and continuing discussions. TBA

Session 8 (2.5h)	Thurs 19:30	Spatial Organization and Cell Signaling III Chair: Jim Faeder
	Nigel Burroughs	Convergence in immune synapse modelling
	Daniel Davis	NK cell synapses and nanotubes
	TBA	TBA
	<i>Discussion:</i> Organizers:	What has modelling done for understanding the cell synapse? Is modelling important for synapse biology? Nigel Burroughs and Michael Dustin.

Session 9 (2h)	Friday 9:00	Emergent Discussion Session.
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IMPORTANT NOTES

Talks: Unless otherwise arranged, talks should be around 25-30mins, to allow time for questions and feedback after each talk and to allow substantial time for pre-organized and spontaneous discussion at the end of each session.

Slides can be added to discussions: As appropriate, participants are encouraged to pre-submit a few slides to the discussion organizers noted for each session.

Emergent discussions: Participants are strongly encouraged to suggest new discussion topics that can be added to any session, especially Thursday evening and Friday morning sessions. These can be suggested to the main organizers and/or the session chairs.

Friday morning: We have intentionally kept Friday morning free for extended discussions and a few mini-talks responding to topics raised at the meeting. We would also like to have an open-problem discussion during this time. Please contact the main organizers about anything you would like to add to this.

Small group meetings: We have access to a few additional small rooms if needed for small group meetings during the workshop.