



**Ottawa
2022**



Biophysical Society
Soci t  de biophysique
du Canada



IUPAB
CONNECTING THE
WORLD OF BIOPHYSICS

FULL PROGRAM



Biophysical Society of Canada

Joint IUPAB Focused Meeting and 7th Annual Meeting

May 23-27, 2022

University of Ottawa

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The meeting program including lists of invited speakers, abstracts, keynote and award winner lecturer bios, lists of participants, etc. are all found on the conference website: <https://event.fourwaves.com/jointbsc2022iupab>

WIFI INFORMATION

Network Name: guOttawa - no identification needed

Bienvenue à Ottawa! Welcome to Ottawa!

Welcome to the 7th Annual Meeting of the Biophysical Society of Canada (BSC)! This year's meeting will be held on the campus of the University of Ottawa (uOttawa) located minutes walk from the heart of the Nations Capital including the Canadian Parliament and all of Canada's Capital attractions. After a three-year hiatus, we return with an in-person meeting with a livestreaming option for those who cannot attend in person. The annual meeting offers attendees the opportunity to learn about exciting new developments in biophysics research and to network with peers from across Canada and further afield. The meeting is dedicated to biophysical techniques and discoveries that have revolutionized research leading to advancements in medicine, pharmaceutical sciences, biotechnology, material sciences and biosensing.

The 2022 meeting will be held in conjunction with an IUPAB Focused Meeting titled "The biophysics of ligand-gated ion channels: from structures to drug discovery". The IUPAB meeting hosts the top ligand-gated ion channel structural and functional biologists from across the globe from May 23rd – 25th, with one day overlapping the 7th Annual BSC meeting from May 25th – 27th. The IUPAB meeting features two keynote talks by Eric Gouaux (Vollum Institute, OHSU) and Henry Lester (Caltech). The BSC meeting features four keynote talks by Cees Dekker (TU Delft), Ruth Nussinov (NIH), Sandra Schmid (CZ Biohub), and Sriram Subramaniam (UBC). The BSC also features the National Lecture by Julie Forman-Kay (University of Toronto), the 2022 BSC Fellow, and the 2022 Young Investigator Award Lecture by Trushar Patel (University of Lethbridge). All attendees are invited to participate in the trainee symposium in the afternoon on May 24th, just prior to the opening mixer. The symposium will consist of a career session and will provide a venue for trainees to share their research accomplishments and network with their peers.

Nous sommes reconnaissants pour le soutien généreux de nos commanditaires industriels, ainsi que de l'appui des départements et instituts des facultés de médecine et des sciences de l'Université d'Ottawa. Enfin, nous vous remercions d'avoir fait le voyage jusqu'ici, que vous soyez de la région ou de passage à Ottawa. Nous sommes fiers de vous accueillir sur notre campus moderne au cœur de la capitale nationale. Nous nous attendons à une réunion stimulante !

John Baenziger (uOttawa), Vincent Tabard-Cossa (uOttawa), Jyh-Yeuan (Eric) Lee (uOttawa), Corrie daCosta (uOttawa), Anna Panchenko (Queen's), Mazdak Khajehpour (Manitoba) and Derek Bowie (McGill)

President's message

At long last, we are gathering again! On behalf of the Biophysical Society of Canada (BSC), I welcome you to Ottawa, whether you are joining us in person or virtually. Je vous souhaite la bienvenue au congrès annuel 2022 de la Société de Biophysique du Canada (SBC) à l'Université d'Ottawa. I hope that the annual meeting of the BSC will provide each of you an opportunity to be exposed to new research findings, stimulated to think in new ways about your own research, and to renew and forge new connections with others in the Canadian and international biophysics communities. This year, we offer a unique bridge to an International Union of Pure and Applied Biophysics (IUPAB) Focused Meeting titled "The biophysics of ligand-gated ion channels: from structures to drug discovery", which immediately precedes the BSC meeting. For those joining the BSC meeting from the IUPAB meeting, welcome to our BSC community!

I would like to acknowledge the conference organizing team for its work in putting together this outstanding scientific and social program of events: John Baenziger, Vincent Tabard-Cossa, Jyh-Yeuan (Eric) Lee, Anna Panchenko and Mazdak Khajehpour. Thanks also to the organizers of the IUPAB Focused Meeting, John Baenziger, Corrie daCosta and Derek Bowie. Huge thanks for your efforts on behalf of the BSC! Thanks also to the members of the BSC Trainee Executive who put together the Trainee Symposium, which provides an opportunity to showcase the research of our trainees and allows them to build their professional networks. Finally, I would like to thank the financial sponsors of BSC 2022. Your contributions have allowed us to maintain the affordability of this meeting for all participants, for which we are grateful.

J'espère que vous serez stimulés par ce congrès et plus que jamais motivés à contribuer à notre société. I encourage you to get involved in our society!

Nancy Forde
President

Biophysical Society of Canada / Société de Biophysique du Canada

BSC 2022 LOCAL ORGANIZING COMMITTEE

John Baenziger
uOttawa

Vincent Tabard-Cossa
uOttawa

Jyh-Yeuan (Eric) Lee
uOttawa

Anna Panchenko
Queen's University

Mazdak Khajehpour
University of Manitoba

IUPAB 2022 LOCAL ORGANIZING COMMITTEE

John Baenziger
uOttawa

Corrie daCosta
uOttawa

Derek Bowie
McGill University

BIOPHYSICAL SOCIETY OF CANADA - EXECUTIVE TEAM

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Claudiu Gradinaru
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Awards

Isaac Li
Web & Social Media

Sarika Kumari
Trainee
Representative

Vishal Pandya
Trainee
Representative

BSC 2022 TRAINEE SYMPOSIUM LOCAL ORGANIZING COMMITTEE

Toka Hussein
Graduate student

Anna Ananchenko
Graduate student

Mariam Taktek
Graduate student

Rebecca Dean
Graduate student

Megan Miaro
Graduate student

Deepansh Mody
Graduate student

Department of Biochemistry, Microbiology and Immunology, Department of Chemistry
and Biomolecular Sciences, University of Ottawa.

BIOPHYSICAL SOCIETY OF CANADA – TRAINEE EXECUTIVE TEAM

Sarika Kumari
President
Memorial University
of Newfoundland

Vishal Pandya
Vice President
Memorial University
of Newfoundland

Benjamin Baylis
Member at Large
University of Guelph

Tam Pham
Member at Large
Dalhousie University

Alaa Al-Shaer
Member at Large
Simon Fraser
University

Alex Brown
Member at Large
Dalhousie University

MacAulay Harvey
Member at Large
Saint Mary's
University

Emily Prowse
Member at Large
McGill University

Jeff Simmons
Member at Large
Dalhousie University

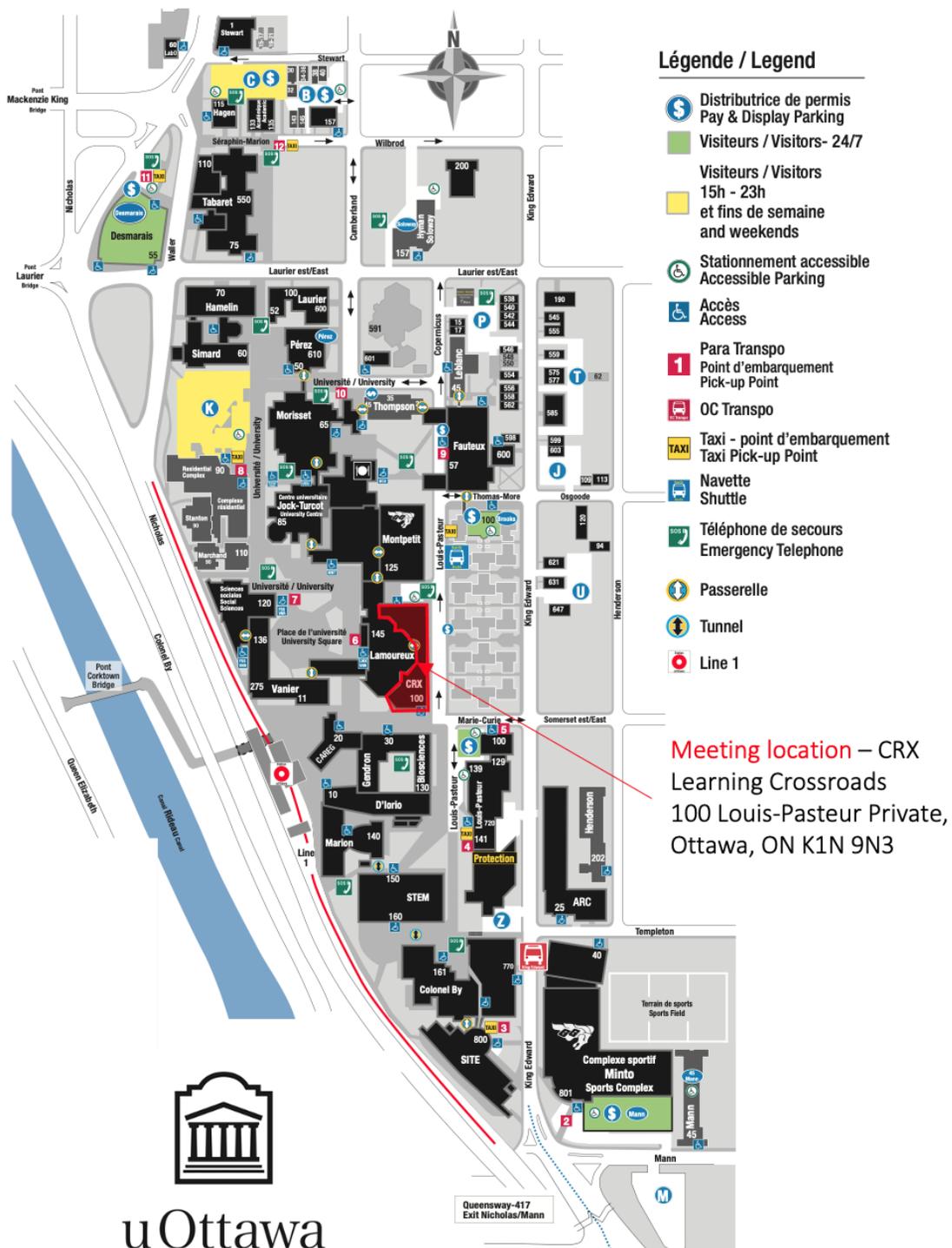
Kathleen Vergunst
Member at Large
Dalhousie University

**Samira Rasouli
Koohi**
Member at Large
University of Alberta

Alyssa Oke
Member at Large
Simon Fraser
University

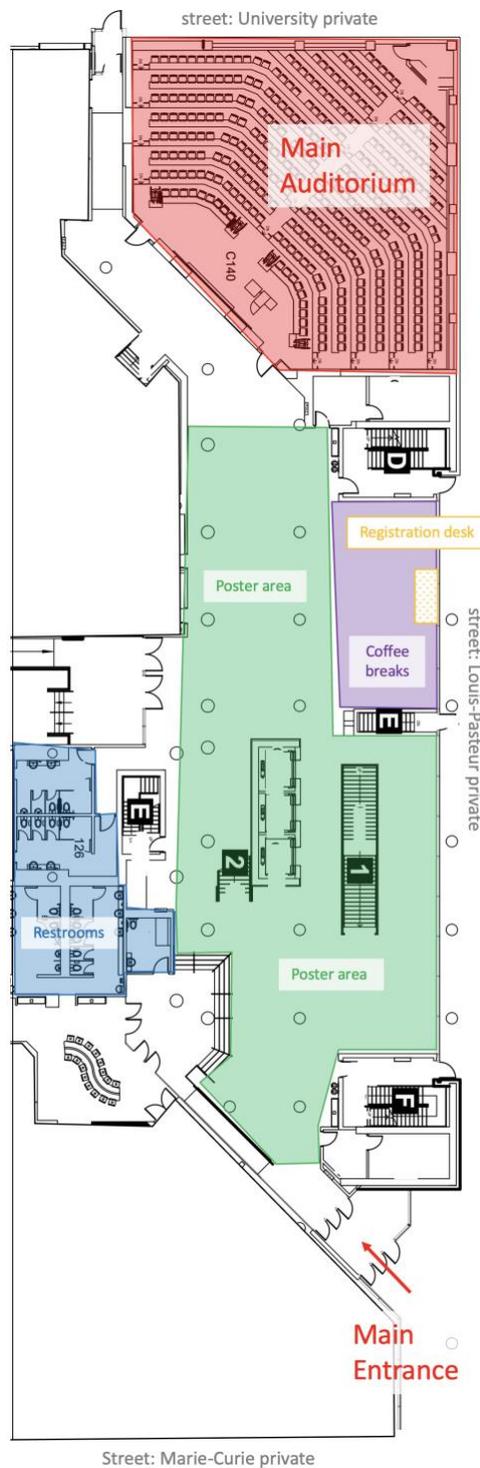
CONFERENCE LOCATION

University of Ottawa maps: <https://maps.uottawa.ca/>



CONFERENCE LOCATION

CRX Learning Crossroads, 100 Louis-Pasteur Private



RESTAURANTS AND TAKE-OUT OPTIONS FOR LUNCH

Searching “restaurants near me” on google maps will give you many options close to campus. Due to the pandemic, some options on campus are closed. We recommend going off campus to either Sandy Hill (Zone 1 on the map below), to Elgin Street via the pedestrian bridge over the Rideau canal (Zone 2) or to the Byward Market (Zone 3) (either on foot or via the O-train West to the Rideau stop (1 stop from campus) where you will find over 70 options!

Zone 1 – uOttawa & Sandy Hill (< 1 km)

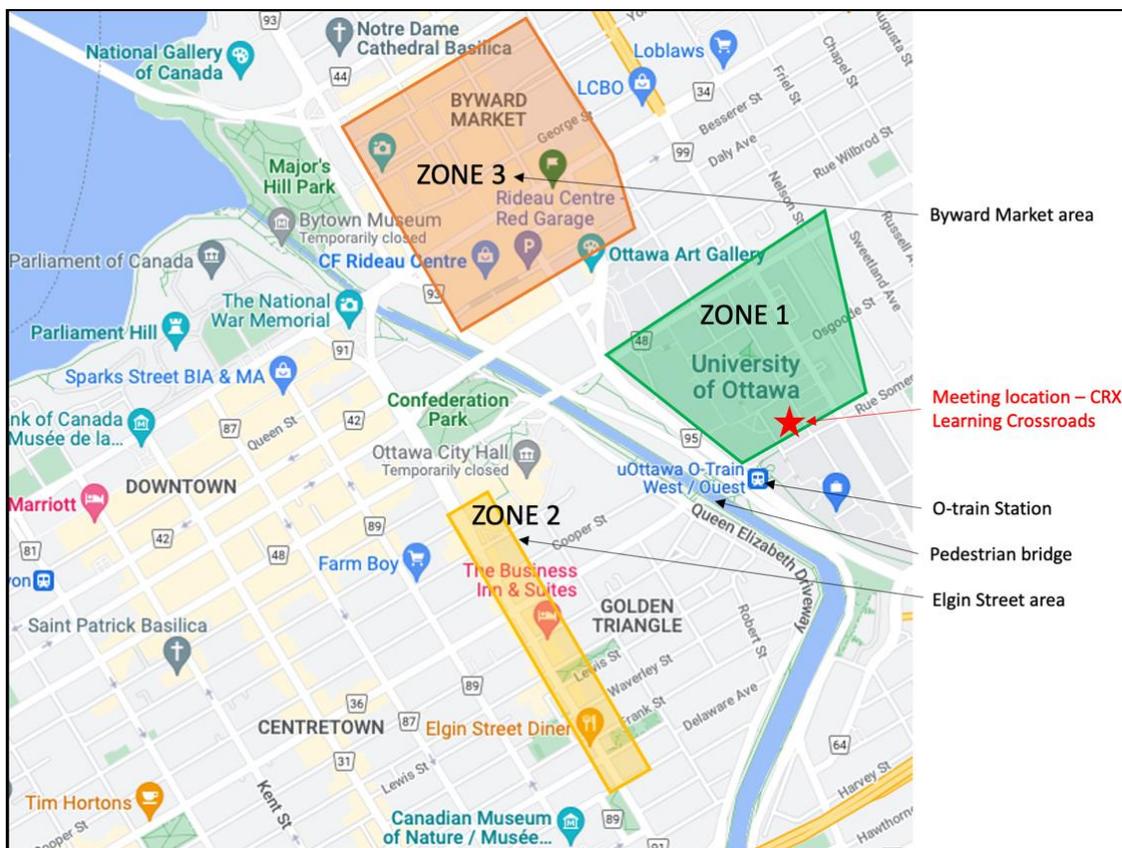
- Première Moisson: Social Sciences Building, 120 University Private
- Le Bac à frites (Foodtruck): 56 University Private
- Freshii: 50 Laurier Ave. E
- Subway : 50 Laurier Ave. E & 231 Laurier Ave. E
- Father & Sons Restaurant: 112 Osgoode St.
- 3 Brothers Shawarma & Poutine: 124 Osgoode St.
- No Forks Given: 191 Rue Somerset St. E
- In's Kitchen - 1-65 Templeton St.
- CoCo Fresh Tea & Juice - 218 Laurier Ave. E.
- Second Cup Café - 153 Laurier Ave. E.

Zone 2 – Elgin Street (~15 min walk via pedestrian bridge next to O-train)

- Johnny Farina: 216 Elgin St.
- Zak's Diner Elgin St: 220 Elgin St.
- Sir John A Pub: 284 Elgin St.
- PI-RHO Grill: 346 Elgin St.
- Pure Kitchen Elgin: 340 Elgin St.

Zone 3 – Byward Market (<10 min by O-Train, ~20 min walk):

- Check out over 70 options here: <https://www.byward-market.com/>



BSC BANQUET AND IUPAB-BSC MIXER

The IUPAB-BSC Mixer (Tuesday evening, May 24th) will be held at the **Aulde Dubliner & Pour House**, 62 William St. The BSC Banquet (Thursday evening, May 26th) will be held at the **Side Door Restaurant**, 18b York St. Both are in Zone 3 in the Byward Market.



COVID INFORMATION

Covid Safety and Mask Policy: Learning Crossroads (CRS) is a new building with modern ventilation. The organizers chose this location for the IUPAB - BSC conference because the lobby, where the coffee breaks and poster sessions will take place, is spacious with high ceilings. The conference auditorium (CRX-C140) seats 350 people and is thus *much* larger than required for the IUPAB - BSC conference. This will ensure that there is ample spacing for attendees during the conference lectures. To ensure the safety of those on campus, the University of Ottawa has extended its current mandatory masking policy until the end of May. Wearing a mask is always mandatory, except when seated to eat. You can find more information here: <https://www.uottawa.ca/coronavirus/en/be-part-of-a-safe-return>. The organizers ask that all attendees adhere to the masking policy in consideration of the health and safety of fellow attendees.

COVID Testing: Countries, such as the United States of America, require a negative COVID test prior to boarding your return flight. *Pre-travel testing is NOT available at the Ottawa International Airport.* Below are private providers that offer pre-travel clearance tests. For more information, including clickable links, go to <https://yow.ca/en/recovery>.

- [Appletree Medical Clinic](#)
- [Bridle Path Pharmasave](#)
- [LifeLabs](#)
- [MD Connected/JC Health](#)
- [PCR Travel Test Ontario](#)
- [Riverside Travel Medical Clinic](#)
- [Shoppers Drug Mart](#)

Rapid antigen screening is available at the Shoppers Drug Mart located in the Rideau Center, a short walk from CRX. PCR Travel Test Ontario offers a range of tests (rapid antigen, expedited RT-PCR and regular RT-PCR), but is a 15-minute drive from CRX. **Please make yourself aware of the testing requirements for your return travel and, if required, book the appropriate test well in advance of your return flight.** You can use the above links to book an appointment for the appropriate test. Especially for Shoppers Drug Mart, make sure that you choose the Rideau Center location.

REGISTRATION INFORMATION

The registration desk is in the atrium of the Learning Crossroads (CRX) Building across from the lecture hall (**CRX-C140**) where all talks will take place.

Hours of registration

Monday May 23	8:00 AM - 12:00 AM
Tuesday May 24	10:00 AM – 6:00 PM
Wednesday May 25	8:00 AM - 1:00 PM
Thursday May 26	10:00 AM - 13:00 PM

RECEPTION INFORMATION

IUPAB - BSC Mixer: Tuesday May 24, 5:30 PM - 8:00 PM at the Aulde Dubliner & Pour House, 62 William St in the Byward Market

Banquet: Thursday May 26, 6:00 PM - 10:00 PM at the Side Door Restaurant, 18b York St. in the Byward Market

Closing Reception: Weather permitting, those interested will meet for an informal gathering on the patio for drinks and/or dinner at Social, 537 Sussex Dr. in the Byward Market from 5:30 to 8:00 PM. The patio is in the courtyard adjacent to the Side Door Restaurant.

POSTER INFORMATION

The poster board size is 4' (width) x 4' (height). The poster sessions for both the IUPAB and BSC meetings will be held in the lobby of CRX. The poster boards for the IUPAB meeting will be available on the morning of Monday, May 23rd. IUPAB posters should remain in place until noon on Wednesday May 25th. The numbering of the IUPAB posters is listed on page 30 (abstracts are on the conference website). The boards for the BSC posters will be available by noon on Wednesday, May 25th, although many will be empty earlier. BSC posters should remain in place until noon on Friday, May 27th. The numbering of the BSC posters is listed on page 31 (abstracts on the conference website). Poster viewing will be held during lunch breaks and/or coffee breaks. The main catered BSC poster session with poster judging will be Wednesday evening, May 25th, from 6:10 PM to 9:00 PM. Presenters with **odd-numbered posters** should be at their posters from 6:30 PM to 7:30 PM. Presenters with **even-numbered posters** should be at their posters from 7:30 PM to 8:30 PM. Everyone is welcome to visit posters at their leisure.

ACCESSIBILITY AND INCLUSION

Accessibility Parenting Resources

If you have disability-related accommodation needs or parenting-resources needs, please contact Vincent Tabard-Cossa (tcossa@uottawa.ca) to work with you to make appropriate arrangements. This may include, for example, information about accessible services on campus.

Washroom Inclusivity

A list of washrooms that are inclusive to all, regardless of gender identity: <https://www.uottawa.ca/respect/accessibility-hub/available-washrooms-all-regardless-gender-identity>

Multi-faith Spaces at uOttawa:

https://www.uottawa.ca/respect/accessibility-hub/Multi-faith_spaces

Campus Maps

Campus maps with directions, parking, buildings, accessibility, etc.: <https://maps.uottawa.ca/>

The Biophysical Society of Canada is excited to partner with the International Union of Pure and Applied Biophysics to host this fabulous joint meeting!



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ABOUT THE INTERNATIONAL UNION OF PURE AND APPLIED BIOPHYSICS

The International Union for Pure and Applied Biophysics (IUPAB: <http://iupab.org/>) was formed in Stockholm in 1961 as the International Organisation for Pure and Applied Biophysics. It was established as the International Union in 1966, when it became a member of the ICSU (International Council for Science) family. Affiliated to it are the national adhering bodies of 61 countries. Its function is to support research and teaching in biophysics. Its principal regular activity is the triennial International Congresses and General Assemblies.

The IUPAB “Focused” meeting is a new initiative promoted by the IUPAB. The IUPAB Focused Meeting “The biophysics of ligand-gated ion channels: from structures to drug discovery” is the inaugural IUPAB Focused Meeting!

ABOUT THE BIOPHYSICAL SOCIETY OF CANADA

The Biophysical Society of Canada (BSC: <https://biophysicalsociety.ca/>) was officially formed in 1985 by a group of Canadian scientists led by Don Chapman (Cross Cancer Institute, Edmonton), Alan Groom (University of Western Ontario, London) and Ian Smith (then at the NRC Institute for Biological Sciences, Ottawa). The BSC has maintained close ties to the IUPAB throughout its existence, with a representative of the BSC sitting on the IUPAB council since the early 1970s. BSC founder, Ian Smith, served for many years as a member of council, and then as Vice-President and President of the IUPAB. The BSC hosted the highly successful 10th IUPAB congress in 1990 in Vancouver.

The BSC has evolved into an independent, dynamic and diverse society with membership from across Canada. Professional activities of the BSC include an annual meeting, sponsorship of symposia and trainee travel awards to both our annual meeting and the annual meeting of the US Biophysical Society, and the administration of society awards. The BSC sponsors prizes for the best student posters at the annual meeting of the BSC. Researchers who have made exceptional contributions to Biophysicists are recognized as Fellows of the Biophysical Society of Canada. Outstanding researchers are also recognized annually as the National Lecturer at the BSC meeting. Finally, outstanding contributions to the BSC are recognized by the Michele Auger award for exceptional service.

PLATINIUM CORPORATE SPONSOR

The logo for nanjion, featuring the word "nanjion" in a bold, white, lowercase sans-serif font. The letters 'j' and 'i' are stylized with brackets on their left sides. The text is centered within a solid black horizontal rectangular bar.

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PROGRAM OVERVIEW

All oral presentations and poster sessions will take place in the Learning Crossroads (CRX).

Monday, May 23rd

8:45 AM – 9:00 AM	Opening Remarks
9:00 AM – 10:30 AM	IUPAB Theme 1: TRP Channels
10:30 AM – 11:00	Coffee Break & IUPAB Posters
11:00 AM – 12:30 PM	IUPAB Theme 2: Pentameric Ligand-Gated Ion Channels
12:30 PM – 1:30 PM	Lunch & IUPAB Posters
1:30 PM - 2:00 PM	Selected Talks
2:00 PM – 4:00 PM	IUPAB Theme 3: Muscle nAChRs
4:00 PM – 4:30 PM	Coffee Break & IUPAB Posters
4:30 PM – 5:30 PM	IUPAB Keynote: Eric Gouaux

Tuesday, May 24th

9:00 AM – 10:30 AM	IUPAB Theme 4: Fluorescence and Ligand-Gated Ion Channels
10:30 AM – 11:00 AM	Coffee Break & IUPAB Posters
11:00 AM – 12:30 PM	IUPAB Theme 5: iGluRs
12:30 PM – 1:30 PM	Lunch & IUPAB Posters
12:30 PM – 5:30 PM	Trainee Symposium (CRX-C240)
1:00 PM – 1:30 PM	Sponsor Presentation: Nanion Technologies
1:30 PM – 3:00 PM	IUPAB Theme 6: Inactivation and Desensitization
3:00 PM – 3:30 PM	Coffee Break & IUPAB Posters
3:30 PM – 4:00 PM	Selected Talks
4:00 PM – 5:30 PM	IUPAB Theme 7: Computational Approaches to LGICs
5:30 PM – 8:00 PM	IUPAB-BSC Mixer: The Aulde Dubliner, 62 William St.

Wednesday, May 25th

8:45 AM – 9:00 AM	Opening Remarks
9:00 AM – 10:30 AM	IUPAB-BSC Session 1: Ligand-Gated Ion Channels
10:30 AM – 11:00 AM	Coffee Break and IUPAB Posters
11:00 AM – 11:40 AM	IUPAB – BSC Keynote: Henry Lester
11:40 AM – 1:45 PM	Lunch (IUPAB poster take down & BSC poster set up)
1:15 PM – 1:45 PM	Sponsor Presentation: Malvern Panalytical

1:45 PM – 3:30 PM	BSC Session 2: Nanoscale Biophysics
2:10 PM – 2:25 PM	BSC Trainee Paper of the Year: Adam Yasunaga
2:50 PM – 3:30 PM	Keynote: Cees Dekker via Zoom
3:30 PM – 4:00 PM	Coffee Break & BSC Posters
3:30 PM – 3:50 PM	Corporate Presentation: Sophion Bioscience
4:00 PM – 5:40 PM	BSC Session 3: Cellular Biophysics
5:40 PM – 6:10 PM	BSC YIA : Trushar Patel
6:10 PM – 9:00 PM	Catered BSC Poster Session

Thursday, May 26th

9:00 AM – 10:40 AM	BSC Session 4: Lipids and Membranes
10:40 AM – 11:10 AM	Coffee Break & BSC Posters
11:10 AM – 12:25 PM	BSC Session 5: Biophysics of the Nucleus
12:25 PM – 2:30 PM	Lunch & BSC Business Meeting (CRX-C407)
2:00 PM – 2:30 PM	Sponsor Presentation: Lumicks Technologies
2:30 PM – 4:25 PM	BSC Session 6: Biomolecular Structure and Dynamics I
2:30 PM – 3:10 PM	Coffee Break
4:45 PM – 5:00 PM	Trainee Travel and Poster Awards
5:00 PM – 5:40 PM	National Lecture: Julie Forman-Kay
6:00 PM – 10:00 PM	Banquet: Side Door Restaurant, 18b York St.

Friday, May 27th

8:30 AM – 10:10 AM	BSC Session 7: Single Molecule Biophysics
10:10 AM – 10:40 AM	Coffee Break & BSC Posters
10:40 AM – 12:35 PM	BSC Session 8: Cells and Systems
11:55 AM – 12:35 PM	Keynote: Sandra Schmid
12:35 PM – 2:30 PM	Lunch
2:30 PM – 4:50 PM	Biomolecular Structure and Dynamics II
2:30 PM – 3:10 PM	Keynote: Sriram Subramaniam
4:50 PM – 5:00 PM	Closing Remarks
5:30 PM – 8:00 PM	Informal Closing Mixer on the patio at Social, 537 Sussex Dr.

IUPAB SCIENTIFIC PROGRAM

Monday, May 23rd

8:45 AM **Welcoming Address**
John Baenziger

9:00 AM – 10:30 AM **IUPAB Theme 1: TRP Channels**

Chair: Vasanthi Jayaraman

9:00 AM Alexander Sobolevsky, Columbia University
Structural mechanism of heat-induced opening of a temperature-sensitive TRP channel

9:30 AM Wei Lu, Van Andel Institute
Activation and Inhibition of the “taste channel” TRPM5

10:00 AM Vera Moiseenkova-Bell, University of Pennsylvania
Structural pharmacology of TRPV channels

10:30 AM – 11:00 AM **Coffee Break and IUPAB Posters**

11:00 AM – 12:30 PM **IUPAB Theme 2: Pentameric Ligand-Gated Ion Channels**

Chair: Rebecca Howard

11:00 AM Pei Tang, University of Pittsburgh School of Medicine
What can we do with and learn from the flexible intracellular domain of Cys-loop receptors?

11:30 AM Chris Ulens, KU Leuven
Sites of allosteric modulation in a pentameric ligand-gated ion channel

12:00 PM Hugues Nury, Institut de Biologie Structurale
The puzzling activity of the antidepressant Vortioxetine at 5-HT₃ receptors

12:30 PM – 1:30 PM **Lunch and IUPAB Posters**

1:30 PM – 2:00 PM **Selected Talks from Abstracts**

Chair: David MacLean

1:30 PM Ayman K Hamouda, The University of Texas at Tyler
Unraveling the pharmacological differences between the two $\alpha 4\beta 2$ nAChR isoforms using positive allosteric modulators

1:45 PM Alican Gulsevin, Vanderbilt University
The Allosteric Activation of $\alpha 7$ nAChR by α -Conotoxin M1C Is Modified by Mutations at the Vestibular Site

2:00 PM – 4:00 PM IUPAB Theme 3: Muscle-Type nAChRs

Chair: Pierre-Jean Corringer

2:00 PM Anthony Auerbach, SUNY at Buffalo
Agonist Efficiency

2:30 PM Md Mahfuzur Rahman, UT Southwestern Medical Center
Asymmetric transitions and diverse antagonism of the muscle nicotinic receptor spontaneously

3:00 PM Corrie daCosta, University of Ottawa
Ancestral acetylcholine receptor β -subunit forms homopentamers that prime before opening spontaneously

3:30 PM Stephen Sine, Mayo Clinic
Conserved salt bridge regulates coupling between ion permeation and channel gating in muscle acetylcholine receptor

4:00 PM – 4:30 PM Coffee Break & IUPAB Posters**4:30 PM – 5:30 PM IUPAB Keynote Lecture**

Chair: Derek Bowie

4:30 PM Eric Gouaux, Vollum Institute
How we hear

Tuesday, May 24th**9:00 AM – 10:30 AM IUPAB Theme 4: Fluorescence Spectroscopy and Ligand-Gated Ion Channels**

Chair: Vera Moiseenkova-Bell

9:00 AM Pierre-Jean Corringer, Institut Pasteur
Illumination of progressive and variable allosteric mechanism mediating pentameric channel activation

9:30 AM Vasanthi Jayaraman, University of Texas Health Science Center at Houston
Glutamate receptors from single molecules to synapses

10:00 AM Baron Chanda, Washington University in St. Louis
Probing complex ligand binding allostery in pacemaker ion channels using single molecule measurements

10:30 AM – 11:00 AM Coffee Break and IUPAB Posters**11:00 AM – 12:30 PM IUPAB Theme 5: iGluRs**

Chair: Alexander Sobolevsky

11:00 AM Lonnie Wollmuth, Stony Brook University
Pulling and pushing: Fast signaling via the NMDA receptor

11:30 AM Terunaga Nakagawa, Vanderbilt University
Structure and mechanism of the AMPA receptor in complex with its auxiliary subunit

12:00 PM Derek Bowie, McGill University
The inner workings of the AMPA receptor-auxiliary subunit complex

12:30 PM – 1:30 PM **Lunch and IUPAB Posters**

1:30 PM – 3:00 PM **IUPAB Theme 6: Inactivation and Desensitization**

Chair: Corrie daCosta

1:30 PM David MacClean, University of Rochester Medical Center
Mechanism of Acid-sensing ion channel desensitization

2:00 PM Timothy Lynagh, University of Bergen
Comparative analysis of the FaNaC family identifies determinants of neuropeptide activity

2:30 PM Kenton Swartz, National Institute of Neurological Disorders and Stroke
Structure of the Shaker Kv channel and mechanism of slow C-type inactivation

3:00 PM – 3:30 PM **Coffee Break and IUPAB Posters**

3:30 PM – 4:00 PM **Selected Talks from Abstracts**

Chair: Mackenzie Thompson

3:30 PM Catherine Bergh, Stockholm University
State-Dependent Protein-Lipid Interactions in a Ligand-Gated Ion Channel

3:45 PM Casey Gallagher, University of Sydney
Identification and characterization of lipids that are positive allosteric modulators of glycine receptors.

4:00 PM – 5:30 PM **IUPAB Theme 7: Computational Approaches to LGICs**

Chair: Hugues Nury

4:00 PM Grace Brannigan, Rutgers University - Camden
Computational prediction of specifically bound lipids for pentameric ligand-gated ion channels

4:30 PM Philip Biggin, University of Oxford
TRPA1 activation by electrophile irritants through molecular dynamics simulation and mutual information analysis

5:00 PM Rebecca Howard, Stockholm University
Structure and dynamics of conserved modulatory mechanisms in a pentameric ligand-gated ion channel

5:30 PM – 8:00 PM **IUPAB - BSC Mixer**

TRAINEE SYMPOSIUM

Presentations in CRX-G240. Registration & Coffee in the Lobby of CRX

Tuesday May 24th

12:30 PM – 12:35 PM **Welcoming Address**
Sarika Kumari, President of the BSC Trainee Executive

12:35 PM – 3:00 PM **Career Session**
Chair: Sarika Kumari

- 12:35 PM Trushar Patel, Canada Research Chair, University of Lethbridge
- 1:05 PM Kyle Briggs, CEO & Co-Founder of Nothern Nanopore Instruments Inc.
- 1:35 PM Shawn McGuirk, Deputy Director of NSERC
- 2:05 PM Naman Shah, Senior Scientist, Paraza Pharma Inc.
- 2:35 Panel Discussion
-

3:00 PM - 3:30 PM **Coffee Break**

3:30 PM – 5:30 PM **Trainee Talks**
Chair: Vishal Pandya

- 3:30 PM Yanitza Trosel, Memorial University of Newfoundland
Diffusion NMR of Alpha Synuclein in the presence of bacterial cell lysate crowders
- 3:45 PM Vinayak Mull, Dalhousie University
Adhesion force microscopy imaging reveals the charge distribution at the surface of single collagen fibrils
- 4:00 PM Euan Joly-Smith, University of Toronto
Inferring gene regulation from static snapshots of gene expression variability
- 4:15 PM Thaisa Luup Carvalho Kannen, University of Toronto
Multi-axis electromagnetic sample handler for live imaging of organoids structure and dynamics
- 4:30 PM Sajad Shiekh, Kent State University
Emerging Accessibility Patterns in Long Telomeric Overhangs
- 4:45 PM Cynthia Shaheen, University of British Columbia
Non-equilibrium structural dynamics of supercoiled DNA plasmids exhibits asymmetrical relaxation
- 5:00 PM Thomas Tsangaris, University of Toronto
Finding Order in Disorder: Modelling the Disordered Protein 4E-BP2
- 5:15 PM Benjamin Baylis, University of Guelph
Closing Remarks
-

5:30 PM – 8:00 PM **IUPAB - BSC Mixer**

IUPAB-BSC JOINT SCIENTIFIC PROGRAM

Wednesday, May 25th

8:45 AM **Welcoming remarks**
John Baenziger, Department of Biochemistry, Microbiology and Immunology

9:00 AM – 10:30 AM **IUPAB - BSC Session 1: Ligand-Gated Ion Channels**
Chair: Chris Ulens

9:00 AM Andrija Sente, MRC Laboratory of Molecular Biology
Structural Diversity of GABA_A Receptors

9:30 AM Sudha Chakrapani, Case Western Reserve University
Gating Mechanisms and Drug Modulation of Pentameric Ligand-Gated Ion channels

10:00 AM John Baenziger, University of Ottawa
Conformational transitions and ligand-binding to a muscle-type nicotinic acetylcholine receptor

10:30 AM - 11:00 AM **Coffee Break and IUPAB Posters**

11:00 AM - 11:40 PM **IUPAB – BSC Keynote Lecture**
Chair: John Baenziger (University of Ottawa)

11:00 AM Henry Lester, Caltech
Subcellular Pharmacokinetics of Ion Channel Ligands

11:40 PM - 1:45 PM **Lunch Break (IUPAB poster take down & BSC poster set up)**

1:15 PM - 1:45 PM **Sponsor Talk: Malvern Panalytical**

1:45 PM – 3:30 PM **BSC Session 2: Nanoscale Biophysics**
Chair: Vincent Tabard-Cossa (University of Ottawa)

1:45 PM Hendrick de Haan, Ontario Tech University
Will it Leak? Spontaneous Translocation and Escape of DNA from Porous Nanoconfinement

2:10 PM Adam Yasunaga, University of British Columbia Okanagan
Quantification of fast molecular adhesion by fluorescence footprinting

2:25 PM Reuven Gordon, University of Victoria
The Power of One: Seeing Proteins in Action

2:50 PM Cees Dekker, Delft University of Technology (Keynote via Zoom)
Nanopores for studying single molecules – from motors to nuclear transport to protein sequencing

3:30 PM – 4:00 PM **Coffee Break & BSC Posters**

3:30 PM – 3:50 PM **Sponsor Talk: Sophion Bioscience**

4:00 PM – 5:40 PM BSC Session 3: Cellular Biophysics

Chair: Claudiu Gradinaru

- 4:00 PM Joshua Milstein, University of Toronto Mississauga
Advancing spatial proteomics with quantitative single-molecule imaging
- 4:25 PM David Cramb, Toronto Metropolitan University
Serum Proteins on Nanoparticles: Rethinking the early “Protein Corona”
- 4:50 PM Jonathan Rocheleau, University of Toronto
Revealing pancreatic beta-cell metabolism using quantitative fluorescence microscopy
- 5:15 PM Ruby Sullan, University of Toronto Scarborough
Interfacial nanomechanical heterogeneity of the E. coli biofilm

5:40 PM – 6:10 PM BSC Young Investigator Award

Chair: Nancy Forde, President of the BSC

Trushar Patel, University of Lethbridge
Solution structure and interactions of non-coding RNAs

5:40 PM – 9:00 PM BSC Poster Session

BSC SCIENTIFIC PROGRAM**Thursday, May 26th****9:00 AM - 10:40 AM Session 4: Lipids and Membranes**

Chair: Rikard Blunck

- 9:00 AM Jayesh Kulkarni, NanoVation Therapeutics
What is a lipid nanoparticle: On the role of lipids within LNP formulations of nucleic acid
- 9:25 AM Valerie Booth, Memorial University of Newfoundland
Unravelling How Surface-Active Peptides Interact with Cells Using Whole Cell Biophysical Techniques
- 10:00 AM Trevor Moraes, University of Toronto
Bacterial lipoprotein translocation
- 10:25 AM Nazzareno D’Avanzo, Université de Montréal
Computational Prediction of Phosphoinositide Binding to Hyperpolarization-Activated Cyclic-Nucleotide Gated (HCN) Channels

10:40 AM - 11:10 AM Coffee Break and BSC Posters

11:10 AM - 12:25 PM Session 5: Biophysics of the Nucleus

Chair: Mazdak Khajehpour

- 11:10 AM Gil Privé, University of Toronto
Structure-guided design of small molecule inhibitors that target the BCL6 transcription factor
- 11:35 AM Alexey Onufriev, Virginia Tech
In search of structure-function connections in chromatin at the scale of the whole nucleus
- 12:00 AM Alba Guarne, McGill University
Structural basis for DNA targeting by the Tn7 transposon
-

12:25 PM – 2:30 PM Lunch & BSC Business Meeting (CRX-C407)

2:00 PM – 2:30 PM Sponsor Presentation: Lumicks

2:30 PM - 4:25 PM BSC Session 6: Biomolecular Structure and Dynamics I

Chair: Anna Panchenko

- 2:30 PM Ruth Nussinov, The National Cancer Institute, NIH
Emerging Mechanisms of Activation in Cancer and their Linkage to Neurodevelopmental Disorders
- 3:10 PM Lois Pollack, Cornell University
Revealing the structural dynamics of biomolecules using x-rays and XFELs
- 3:35 PM Steven Smith, Queen's University
Molecular determinants regulating macromolecular complex assembly and function
- 4:00 PM Guiseppe Melacini, McMaster University
Allosteric Regulation of Protein Kinases
-

4:25 PM - 4:45 PM Coffee Break and Posters

4:45 PM – 5:00 PM BSC Trainee Travel and Poster Awards

Chair: Nancy Forde, President of the BSC

5:00 PM - 5:40 PM Fellow of the Biophysical Society of Canada & National Lecture

Chair: Nancy Forde, President of the BSC

Julie Forman-Kay, University of Toronto
Regulation of biochemistry and biomolecular condensates by post-translational modifications of intrinsically disordered protein regions

5:40 PM – 6:30 PM Travel to Side Door Restaurant (18b York St., Ottawa)

6:30 PM - 10:00 PM Conference Banquet at Side Door Restaurant

Friday, May 27th**8:30 AM - 10:10 AM BSC Session 7: Single Molecule Biophysics**

Chair: Cécile Fradin

- 8:30 AM Stacey Wetmore, University of Lethbridge
The Structure and Dynamics of Modified Nucleic Acids from Computer Modeling
- 8:55 AM Claudiu Gradinaru, University of Toronto Mississauga
Defining the structure of disordered proteins – from single-molecule experiments to integrative modelling
- 9:20 AM Paul Higgs, McMaster University
Computer Simulations of Non-Enzymatic Template-Directed RNA Synthesis
- 9:45 AM Sébastien Côté, Université de Montréal
The electrostatic gating of carbon nanotube field-effect biosensors characterized at the molecular scale using simulations

10:10 AM - 10:40 AM Coffee Break and Posters**10:40 AM - 12:35 AM BSC Session 8: Cell and Systems**

Chair: Jyh-Yeuan (Eric) Lee

- 10:40 AM Laurent Bozec, University of Toronto
Exploration of nanoscale dermal collagen fibrils phenotype to define human skin biological age
- 11:05 AM Paul Francois, McGill University
Absolute discrimination and universal antigen encoding by T cells
- 11:30 AM Aidan Brown, Toronto Metropolitan University
Origins of protein concentration noise in mitochondria
- 11:55 AM Sandra Schmid, Chan Zuckerberg Biohub
Dynamins: The prototypical membrane fission GTPase

12:35 PM – 2:30 PM Lunch**2:30 PM - 4:50 PM BSC Session 9: Biomolecular Structure and Dynamics II**

Chair: John Baenziger

- 2:30 PM – 3:10 PM Sriram Subramaniam, University of British Columbia
Cryo-EM of Dynamic Molecular Assemblies
- 3:10 PM – 3:35 PM Jan Rainey, Dalhousie University
Applying structure and dynamics to engineer (dys)functional recombinant silks
- 3:35 PM – 4:00 PM Rachel Mansbach, Concordia University
Free Energy Landscapes of Disulfide-rich Peptide Toxins
- 4:00 PM – 4:25 PM Robert Thorne, Cornell University
Physical aspects of sample preparation for single-particle cryo-em and time-resolved crystallography

4:25 PM - 4:50 PM Elizabeth Meiring, University of Waterloo
A fine balance of hydrophobic-electrostatic communications pathways in a pH-switching protein

4:50 PM - 5:00 PM **Closing Remarks**
BSC Organizaing Committee

5:00 PM - **Informal Closing Mixer at Social, 537 Sussex Dr.**

Notes

Notes

IUPAB POSTER SESSION (abstracts online)
(Tuesday, May 23rd until noon on Wednesday, May 25th)

01 - Alican Gulsevin: Vanderbilt University

The Allosteric Activation of $\alpha 7$ nAChR by α -Conotoxin MrlC Is Modified by Mutations at the Vestibular Site

02 - Amanda Perozzo: McGill University

Alternative splicing of AMPA receptor signalling complexes

03 - Anna Ananchenko: University of Ottawa

Probing cholesterol and anionic lipid binding to the nicotinic acetylcholine receptor using MD simulations

04 - Casey Gallagher: University of Sydney

Identification and characterization of lipids that are positive allosteric modulators of glycine receptors

05 - Christian Tessier: University of Ottawa

Ancestral acetylcholine receptor β -subunit forms homomers with spontaneous activity

06 - Daniel Sauter: Sophion Bioscience Inc.

Characterization of the rapidly desensitizing $\alpha 7$ nicotinic acetylcholine receptor using the Qube

07 - Ezry Santiago-McRae: Center for Computational and Integrative Biology, Rutgers University - Camden

Computational Prediction of Specifically Bound Lipids on Pentameric Ligand Gated Ion Channels

08 - Federico Miguez Cabello: McGill University

Functional analysis of pathological variants on the GluA2 AMPA receptor subunit

09 - Mackenzie J. Thompson: University of Ottawa

The coupling of binding and gating in a muscle-type acetylcholine receptor

10 - Xin-tong Wang: McGill University

AMPA receptor auxiliary subunits TARP $\gamma 2$ and CNIH-3 attenuate polyamine block through different structural mechanisms

BSC POSTER SESSION (abstracts online)
(noon on Wednesday, May 25th until noon on Friday, May 27th)

Biomolecular Structure and Dynamics

01 - Simisola Ajayi: University of Manitoba

Investigating the effects of various co-solvents on protein folding

02 - Iman Asakereh: University of Manitoba

Hofmeister Effects of Group II Cations as Seen in the Unfolding of Ribonuclease A

03 - Alexandra Brown: Dalhousie University,

Investigating the molecular mechanisms of a melanogenic transcription factor and its co-activator

04 - Robert Cocciardi: Malvern Panalytical

Enzyme kinetics assays with Isothermal Titration Calorimetry

05 - Hossein Davarinejad: University of Ottawa

The histone H3.1 variant regulates TONSOKU-mediated DNA repair during replication

06 - Sara Evans: Dalhousie University

Reducing the disulfide bond in mutant aciniform spider silk

07 - Emma Ferguson: Dalhousie University

Optimization of the Purification and the Refolding of RquA

08 - Anupama Ghimire: Dalhousie University

Development and characterization of recombinant hybrid spider silks

09 - Sabrina Grégoire: University of Ottawa

Probing the mutational landscape of the CFP1 PHD domain.

10 - Isha Jogleka: University of Texas at Arlington

pH effects on the stability and folding of monomeric caspases

11 - Euan Joly-Smith: University of Toronto

Inferring gene regulation from static snapshots of gene expression variability

12 - Brayden Kell: University of Toronto

Achieving robust perfect adaptation while suppressing stochastic fluctuations in biochemical reaction networks

13 - Justin Sung-Ho Kim: University of Toronto

Conformational Changes of Proteins Induced by Electric Fields in Crystal Simulations

14 - Gabriel Lacroix: Université de Montréal

Structural determinants of shifted KV6.4 inactivation kinetics

15 - Robert Lu: University of Toronto

Domain specific interactions promote tropoelastin coacervation

16 - Trilok Neupane: Dalhousie University

Investigating the mechanism of ridoquinone biosynthesis

17 - Hanieh Rezasoltani: University of Manitoba

Effect of various salts on the tetramerization of Melittin

18 – Cynthia Shaheen: University of British Columbia

Non-equilibrium structural dynamics of supercoiled DNA plasmids exhibits asymmetrical relaxation

19 - Sophie Shi: Sorbonne Université

Illumination of a progressive and variable allosteric mechanism mediating the glycine receptor activation

20 – M. Quadir Siddiqui: University of Lethbridge

Deciphering the role of Zyxin LIM domains in Cell Proliferation

21 – Jeffrey Simmons: Dalhousie University

Solving the Atomic-Level Structure of Recombinant Pyriiform Silk

22 - Bahareh Taghavi Shahraki: University of Manitoba

Effect of Salts on Enzyme Activity: Using Ribonuclease A as a Model System

23 – Yanitza Trosel: Memorial University of Newfoundland

Diffusion NMR of Alpha Synuclein in the presence of bacterial cell lysate crowders

24 – Kathleen L. Vergunst: Dalhousie University

Characterizing the structure and assembly of hydrophobin proteins

Lipids and Membranes**25 – Danny Farhat & Milica Ristovski: University of Ottawa**

Docking analysis of sterol binding on ABCG sterol transporters.

26 – Sarika Kumari: Memorial University of Newfoundland

Role of lipopolysaccharide in antimicrobial peptide membrane interactions probed by deuterium NMR of whole cells.

27 – Sarah McColman: Toronto Metropolitan University

SARS-CoV-2 Virus-Like-Particles using liposome nanotechnology

28 – Danielle McRae: University of Waterloo

Atomic force microscopy and force spectroscopy to study the effect of melatonin on the physical properties of phase-segregated model lipid membranes

29 – Sheyla Montero Vega: Carleton University

Interaction Between Antimicrobial Peptide Magainin 2 and Non-lipid Components in the Bacterial Outer Envelope

30 – Klaidi Shkalla: Toronto Metropolitan University

Delivery of siRNA via cationic liposomes to the hinder expression of nsp12 RNA in SARS-CoV-2

31 – Yue Xu: University of Waterloo

Comparison of Protein Channels Formed by Amyloid β and Gramicidin in Model Lipid Membranes

Ion Channels**32 – Ameneh Ahrari: Université de Montréal**

Endocannabinoid Regulation of Inward Rectifier (Kir2.1) Channels

33 – Anna Ananchenko: University of Ottawa

Probing cholesterol and anionic lipid binding to the nicotinic acetylcholine receptor using MD simulations

34 – Alican Gulsevin: Vanderbilt University

The Allosteric Activation of $\alpha 7$ nAChR by α -Conotoxin Mrlc Is Modified by Mutations at the Vestibular Site

35 – Sultan Mayor: Université de Montréal

Direct Regulation of Hyperpolarization-Activated Cyclic-Nucleotide Gated (HCN1) Channels by Cannabinoid

36 – Laurie Peverini: Institut Pasteur

Extracellular lateral fenestrations of glycine-gated receptors contribute to the ion permeation pathway.

37 – Daniel R. Sauter: Sophion Bioscience Inc.

Characterization of the rapidly-desensitizing $\alpha 7$ nicotinic acetylcholine receptor using the Qube

38 – Alia Syeda: Dalhousie University

Lysosomal ion channel in myogenesis and X-linked myotubular myopathy

39 – Christian Tessier: University of Ottawa

Ancestral acetylcholine receptor β -subunit forms homomers with spontaneous activity

40 – Mackenzie J. Thompson: University of Ottawa

The coupling of binding and gating in a muscle-type acetylcholine receptor

Computational Biophysics**41 – Scott Minh An: University of British Columbia (Okanagan)**

3D mapping of cell surface adhesion via rolling assay

42 – Saman Bazmi: Memorial University of Newfoundland

Effects of macromolecular crowding on protein folding in the presence of nonnative interactions

43 – Rikard Blunck: Université de Montréal

Towards predicting the outcome of disease-related genetic variants

44 – Rebecca Dean: University of Ottawa

Examining the relationship between protein structure and sequence: the RD-HMMR method of statistical coupling analysis

45 - Janet Gaba: Concordia University

Computational investigation of interactions in models of phenolic surfactant monolayers binding with poly-L-proline

46 – Liam Haas-Neill: University of Toronto

Elucidating Oncogenicity of the STAT5b N642H Mutation

47 – Eugene Klyshko: University of Toronto

LAWS: Local Alignment for Water Sites – a method to analyze crystallographic water in simulations

48 – Shuxiang Li: Queen's University

DNA methylation cues in nucleosome geometry, stability and unwrapping

49 – Ziyi Liu: University of Ottawa

Endogenous electric fields: a tuneable consequence of ion homeostasis in functionally polarized cells

50 – Vrinda Nair: Concordia University

Drug Design of Small Molecule (Antibiotics) Implementing Deep Learning Model.

51 – Vishal Pandya: Memorial University of Newfoundland*In-silico evaluation of potential cryptic pocket binders of human farnesyl pyrophosphate synthase***52 – Jesse Sandberg: Rutgers University - Camden***Nougat: A toolkit for analysis of membrane disruption by proteins and other inclusions***53 – Bahman Seifi: Memorial University of Newfoundland***Protein folding and fold switching of the C-terminal domain of transcription factor RfaH.***54 – Mariam Taktek: University of Ottawa***Insight into structural determinants of ion channel open state lifetime from simulations***55 – Thomas Tsangaris: University of Toronto Mississauga***Finding Order in Disorder: Modelling the Disordered Protein 4E-BP2***Single-Molecule and Nanoscale Biophysics****56 – Navid Afrasiabian: Western University***Polymer Capture: the journey of a single polymer chain to a nanopore***57 – Alaa Al-Shaer: Simon Fraser University***Sequence- and temperature- dependent mechanics of single collagen molecules***58 – Nesha Andoy: University of Toronto Scarborough***Immobilization of Cationic Polymer Affects Its Ability to Disrupt Bacterial Membranes***59 – Koushik Bar: Simon Fraser University***Incorporation of Temperature Control in a Centrifuge Force Microscope***60 – Benjamin Baylis: University of Guelph***Single-Molecule Atomic Force Microscopy Force Spectroscopy of Phytoglycogen Nanoparticles Modified by High-Shear Screw Extrusion***61 – Kyle Briggs: University of Ottawa***Toward broadly accessible, highly scalable solid-state nanopore research***62 – Martin Charron: University of Ottawa***Experimental Investigation of Field-Driven Polymer Transport Dynamics in Solid-State Nanopores***63 – Samrat Dutta: Lumicks***Unparalleled Approaches to Directly Visualize DNA-Binding Proteins and Biomolecular Condensates***64 - Yasmeen El-Rayyes: University of Guelph***Changes to the Stiffness and Compressibility of Soft Phytoglycogen Nanoparticles Through Acid Hydrolysis***65 - Ligun He: University of Ottawa***Characterization of DNA Nanostructures using Solid-state Nanopores***66 – Sophia Huang: University of Toronto***Collagen Hybridizing Peptide Detect Acetic Acid Degraded Collagen in Tissue***67 – Philipp Karau: University of Ottawa***Toward DNA data storage with solid-state nanopore readout***68 – Seongho Kim: University of British Columbia***An ultra-low background super-resolution PAINT imaging with molecular beacon*

69 – Allison Leam: University of British Columbia Okanagan

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70 – Aaron Lyons: University of Alberta

Direct characterisation of non-productive attempts at structural self-assembly in single biological molecules

71 – Erin McConnell: University of Ottawa

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72 – Sajad Shiekh: Kent State University

Emerging Accessibility Patterns in Long Telomeric Overhangs

73 – Spencer Smyth: University of Toronto

Force Without Form: Delineating a Disordered Protein Complex with Single-Molecule Fluorescence Spectroscopy

74 – Francis Stabile: McGill University

Single Molecule Convex Lens Induced Confinement (CLiC) for CRISPR Kinetics

75 – Micah Yang: University Of British Columbia

Characterization of Tension Gauge Tether Rupture Forces

76 – Zheng Zhang: University of Toronto

Measuring Rupture Force between Adenosine A2A G-protein Coupled Receptors and Mini-Gs using Optical Tweezers

Imaging and Spectroscopy**77 – Lei Jin: University of Toronto**

Long-term 3D Live Cell Tracking and Morphological Studies by Telecentric Digital Holographic Microscopy

78 – Thaisa Luup Carvalho Kannen: University of Toronto

Multi-axis electromagnetic sample handler for live imaging of organoids structure and dynamics

79 – Tianyi Ma: University of Toronto

Spatial Patterning of Bacterial Competition in Confined Space

80 – Silvan Marti: École Polytechnique Montréal

Finding the needle in a haystack: object classification tools for rare event finding in microscopy data.

81 – Vinayak Mull: Dalhousie University

Adhesion force microscopy imaging reveals the charge distribution at the surface of single collagen fibrils

82 – Francois Simon: Université of Montréal

ExTrack a Spatio-temporal method to assess parameters and states of noisy multi-states tracks

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Impact of Ash2L mutation on MLL complex integrity and epigenetic signalling

85 – Alexis Arvanitis-Vigneault: University of Ottawa

The tetratricopeptide repeat domains of TONSL preferentially binds histone H3.1

86 – Benjamin Barlow: University of Ottawa

Separation of Nav Subtypes in the Axon Initial Segment can Impede or Promote Backpropagation

87 – Javad Eslami: University of Ottawa

Importance of Fibronectin and ECM Microstructure on Cell Adhesion

88 – Xiaohan Zhou: University of Toronto

Conformational Dynamics and Diffusion Patterns of GPCRs Revealed by Single-Molecule Fluorescence

89 – Marzieh Tabefam: Wilfrid Laurier University

Folding and Association of Mitochondrial Carrier Proteins in Lipid Membranes