



NEWSLETTER

SPRING/SUMMER 2025



MESSAGE FROM OUR DEPARTMENT HEAD

Dear MBIM community,

When I reflect on the overarching themes that define this moment in time, the first thing that comes to mind is change. We have experienced a great deal of change—in the global research landscape, in the technology and tools available to us, and in the makeup of our own department—and have responded with strength and resilience.

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***For the interactive
newsletter,
visit: bit.ly/4kSh9Zv***



At a time when research is undervalued, we have found innovative solutions to drive our work forward. We have remained unwavering in our dedication to fundamental scientific principles and in our celebration of biological discovery, and by hosting seminars and conferences, we have provided a venue for researchers from across the world to share in this spirit. Despite the upheaval in geopolitics, we hope that this time of uncertainty may help to attract talent to UBC.

We have also entered a new era in which artificial intelligence and machine learning are more accessible than ever. We have acknowledged the undeniable role that these tools will play in science moving forward, and we have embraced their ability to learn from large volumes of data to generate hypotheses that we can test at the bench. We have launched new data science courses to help students leverage these tools in the lab, and we have hosted various teaching and learning events to help educators understand how AI can be used effectively and responsibly in the classroom.

We have welcomed many new faculty and staff members to the MBIM community, and we are saying goodbye to several individuals who have served as cornerstones of the department. The departure of the class of 2025 is yet another change we must adapt to — and despite all our practice, it won't be easy.

Sincerely,
Dr. Michael Murphy

PEOPLE

GROWING THE MBIM COMMUNITY



Selena Sagan

Professor;

Canada Research Chair

Visit the [Sagan Lab website](#)

Professor Selena Sagan joined the department in July of 2023. Her lab focuses on understanding how RNA viruses work at a molecular level. In positive-sense RNA viruses such as hepatitis C virus or Zika virus, the viral genome itself must serve as a template for translation of the viral proteins, replication of the viral genome, and packaging to make new progeny viral particles. For many viruses, how they coordinate and regulate these activities remains a mystery. The Sagan lab uses state-of-the-art approaches to study the RNA-RNA and protein-RNA interactions important to the life cycle of RNA viruses. Her team aims to understand: Which regions of the genome mediate these events? How are these events regulated? What host and/or viral factors are involved? How do new functions evolve? What can this teach us about regulation of RNA in our own cells? And ultimately, how can we interfere with these processes to develop new vaccine strategies and antiviral therapies?

Assistant Professor Jim Sun joined the department in January of 2024. His lab studies tuberculosis, which remains the leading cause of infectious-disease related deaths globally and is prevalent among the Indigenous population in Canada. His research focuses on understanding how the tuberculosis bacteria disables and reprograms the human immune system for its intracellular survival. Sun's team employs a multidisciplinary approach integrating multi-omics, high content imaging, advanced immunological assays, and drug screening to identify, characterize and optimize targets both in the tuberculosis bacteria and in the host. They are also developing new surveillance strategies for tuberculosis in vulnerable communities with the goal of achieving a real-time TB monitoring system to prevent disease transmission in Indigenous populations. Ultimately, Sun hopes to develop novel tools and therapeutic strategies that will contribute to reducing the global burden of tuberculosis.



Jim Sun

Assistant Professor

Visit the [Sun Lab website](#)

PEOPLE

GROWING THE MBIM COMMUNITY



Phillip Domeier
Assistant Professor

Assistant Professor Phillip Domeier joined the department in January of 2025. His research focuses on the germinal center, a dynamic immune structure that forms in the spleen and lymph nodes. In response to infection, germinal centers activate and expand, ultimately producing B cells that recognize and target the pathogen. Using transgenic mice and human tonsil organoid cultures with a combination of advanced spectral flow cytometry, fluorescent microscopy, and multi-omics techniques, the Domeier lab explores ways to fine-tune activity in germinal centers to modulate immune responses. His team aims to take this approach to develop new treatments for autoimmune diseases such as lupus and create more potent vaccines for influenza and other infectious diseases.



Kirsty McIntyre, PhD
Science Education Specialist

Kirsty McIntyre joined the department as Science Education Specialist in March of 2024. With a PhD in placental physiology, a postgraduate diploma in academic practice, and teaching experience at universities across the USA, UK, and Australia, Kirsty has leveraged her unique expertise to collaborate on curriculum development, support evidence-based education approaches, and foster an accessible and inclusive learning environment.



Sarah Anderson, PhD
Communications Coordinator

Sarah Anderson joined the department as Communications Coordinator in January of 2025. Sarah holds a PhD in chemistry and masters in science journalism and worked as an editor at a print science magazine. Using her strong science communication skills, Sarah creates website and social media content to promote department news, research, publications, and events.

PEOPLE

RETIREMENTS

We celebrate the career and retirement of Professor Pauline Johnson. Johnson's research focused on exploring how proteins expressed on the surface of immune cells — namely CD44 and CD45 — help to orchestrate the immune response. After establishing that CD45 is critical for activating T cells, she investigated the effects of binding between CD44 and the extracellular molecule hyaluronan. Uncovering key evidence that CD44-hyaluronan interactions serve to regulate macrophage activity, she went on to study how this dynamic contributes to infection, inflammation, and metastatic cancer in the lungs.



Pauline Johnson

Throughout her career, Johnson was fiercely dedicated to graduate student training. She regularly spent hours meeting with her students one-on-one, poring over data, troubleshooting experiments, and brainstorming next steps. She took a special interest in her students' personal development, offering guidance that was tailored to each individual's needs. She served as the department's graduate and post-doctoral advisor for five years and was a member of a total of 136 thesis committees. She also developed and launched new graduate-level courses that provide technical instruction and experiential learning in flow cytometry, experimental preclinical models, data science research, and teaching and learning in microbiology and immunology.

We celebrate the career and retirement of Professor Karen Smith. As a member of the undergraduate teaching faculty, Smith taught a range of introductory microbiology lab and lecture courses. Highly engaged in the scholarship of teaching and learning, she led multiple collaborative projects to implement novel teaching practices, including the development of microbe characters and comic-like narratives to illustrate scientific concepts. She is also a champion of student wellbeing, seeking to understand how life factors outside of the classroom influence learning and break down barriers to educational success. She has spearheaded flexible teaching approaches and alternative grading methods that enhance academic tenacity. This work led her to become involved in equity, diversity, and inclusion initiatives across UBC and to become chair of the department's EDI

committee. Beloved by her students, Smith was recognized with a Killam award for excellence in teaching.



Karen Smith

(in purple)

at her retirement celebration

PEOPLE

IN MEMORIAM



Julia Levy

*Professor Emerita
1934-2024*

“Being part of something which started out as fascinating science and ended up effectively changing the lives of thousands of people is an incredible experience. I feel truly blessed to have been part of that.”

-Julia Levy

We honour the life of Professor Emerita Julia Levy, who passed away on December 5, 2024. In 1959, Levy became the first woman to hold a tenure-track faculty position in the Department of Microbiology and Immunology at UBC.

Levy's interest in light-sensitive compounds led her to investigate photodynamic therapy (PDT), in which a toxic compound is activated with light in order to damage abnormal cells and tissue in a specific area of the body. This research proved to have potential beyond the bench, and in 1981, she cofounded the biopharmaceutical company Quadra Logic Technologies (QLT, Inc.). Her team developed the PDT drugs Photofrin for bladder, esophageal, and non-small cell lung cancer and Visudyne for age-related macular degeneration. Visudyne was a breakthrough in the ophthalmology field, offering the first treatment for the leading cause of blindness among the elderly.

Commercialization of Levy's discoveries launched QLT, Inc. to billion-dollar status, its success cementing UBC's reputation as a global leader in cutting-edge science and fueling the emerging entrepreneurial scene in Vancouver. Furthermore, the royalties from the company provided enormous financial returns to support teaching and research at the university.

Upon her retirement, Levy remained an active advisor to the biotechnology community and provided guidance to new life science start-ups through UBC's Sauder School of Business. Her contributions have been recognized through appointment to the Royal Society of Canada and the Order of Canada, several prestigious awards for advancement in vision care, and the Chemical Institute of Canada's Julia Levy Award for successful commercialization of innovation in the field of biomedical science and engineering.

PEOPLE

IN MEMORIAM

We honour the life of Professor Emeritus Julian Davies, who passed away on February 2, 2025. After a mobile scientific career as a self-proclaimed rolling stone, Davies came to UBC in 1992, serving as head of the Department of Microbiology and Immunology and director of the Life Sciences Institute.

Davies was renowned for his research on the mechanisms of antibiotic activity and resistance. He helped to discover that resistance to aminoglycoside antibiotics stems from enzymatic modification of the drug and to identify the genes encoding these enzymes. His pivotal work illuminated the origin, evolution, and spread of key antibiotic resistance genes and paved the way for their application to transfection methods.

In the later stages of his career, Davies delved into the wealth of bioactive molecules produced by microbes, pursuing fundamental understanding of their role as signalling agents and evaluating their potential to be leveraged therapeutically. Vocal about the urgent need for new antibiotics to treat resistant infections, he mined a range of natural sources for compounds that could kill elusive bacteria.

Davies is remembered for his scientific curiosity, joie de vivre, and generosity -- whether with his home on West 6th Avenue, where he and his wife Dottie would host lively dinner parties, his condo in Whistler, where a weekend stay was his donation to the department holiday party raffle each year, or his time, which he spent chatting with faculty, staff, students, and janitors with equal enthusiasm. His numerous accolades include being named a fellow of the Royal Society of Canada, a member of the US National Academy of Sciences, and a recipient of the American Society for Microbiology Gold Metal and the Bristol-Myers Squibb Award for Distinguished Achievement in Infectious Diseases Research.



Julian Davies

*Professor Emeritus
1932-2025*

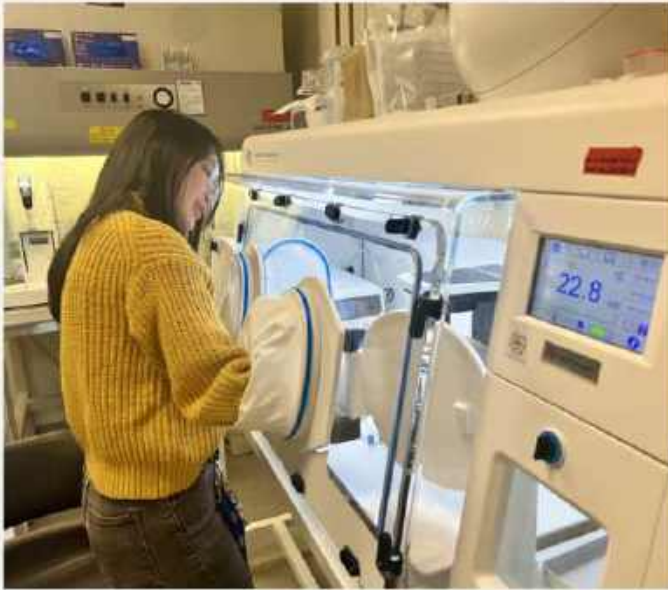
***“The practice of science has provided me with a lifetime of good experiences, lots of fun, and only minor disappointments. ...Overall, the excitement of following lines of reasoning or leaps of imagination to a new finding is more than enough compensation.
-Julian Davies*”**

RESEARCH

The Department of Microbiology and Immunology remains highly reputed as the leading centre for the study of bacteria, fungi, and viruses and their role in human health and the environment. Here we highlight some of our recent research projects, which have yielded publications in top journals and garnered national media attention. Visit the [MBIM News](#) webpage for more research stories.



TROPINI LAB



In collaboration with Annie Ciernia's lab (UBC Biochemistry and Molecular Biology), Professor Carolina Tropini's team demonstrated that gut microbiome disruption in pediatric inflammatory bowel disease (IBD) can lead to changes in sex hormone production, sex organ maturation, mating behaviour, and brain morphology. Their work paves the way for microbiome-based therapies that could attenuate the neurological and endocrine effects of pediatric IBD.

- Sullivan, O. *et al.* Early-life gut inflammation drives sex-dependent shifts in the microbiome-endocrine-brain axis. *Brain, Behavior, and Immunity* **125**, 117-139 (2025).
- [Exploring the microbiome-neuroendocrine connection in early life gut inflammation](#)

HORWITZ AND OSBORNE LABS

Professor Marc Horwitz and Professor Lisa Osborne provided new evidence that latent infection with Epstein-Barr virus can prime the immune system for susceptibility to multiple sclerosis (MS). Using a novel mouse model injected with immune cells from human donors, the researchers demonstrated that Epstein-Barr virus may promote autoimmunity via long-term dysregulation of T cell responses.

“Our findings have implications that therapeutic approaches to reduce, eliminate, or prevent Epstein-Barr virus infection could effectively lessen MS disease incidence.
-Marc Horwitz”

- Allanach, J.R. *et al.* Epstein-Barr virus infection promotes T cell dysregulation in a humanized mouse model of multiple sclerosis. *Sci Adv* **11**, 10 (2025).
- [Epstein-Barr virus infection promotes autoimmunity in multiple sclerosis](#)

RESEARCH

JEAN LAB



Photo: Paul Joseph, UBC

As the lead of the antiviral strategies and therapeutics pillar of the Coronavirus Variants Rapid Response Network, Professor François Jean's team identified a host-directed antiviral compound that blocks the SARS-CoV-2 virus from entering human lung cells and demonstrated that it could be formulated as a nasal spray. Employing medicinal chemistry approaches to optimize the molecule, they then developed the first picomolar antiviral lead drug for circulating SARS-CoV-2 omicron variants.

- Lemieux, G. et al. From N-0385 to N-0920: Unveiling a Host-Directed Protease Inhibitor with Picomolar Antiviral Efficacy against Prevalent SARS-CoV-2 Variants. *J Med Chem* **68**, 7 (2025).
- Professor François Jean reflects on five years of COVID-19

HANCOCK LAB

Professor Bob Hancock's team analyzed blood samples from newborns in The Gambia, Africa and uncovered a gene expression signature that could enable early detection and treatment of neonatal sepsis. Hancock also published a featured report on how systems immunology, a set of computational methods leveraging artificial intelligence, can process patient data to improve diagnosis and personalized medicine for sepsis. Using this approach, his team identified a six-gene panel termed Sepset, developed a portable Sepset blood test, and validated its ability to predict risk of sepsis in a cohort of patients.

- An, A. et al. Predictive gene expression signature diagnoses neonatal sepsis before clinical presentation. *eBioMedicine* **110**, 105411 (2024).
- Hancock, R.E.W. et al. Deciphering sepsis: transforming diagnosis and treatment through systems immunology. *Front Sci* **2**, 10.3389 (2025).
- Malic, L. et al. A machine learning and centrifugal microfluidics platform for bedside prediction of sepsis. *Nat Commun* **16**, 4442 (2025).
- Scientists develop tool to predict sepsis in apparently healthy newborns
- Decoding sepsis with systems immunology
- Rapid bedside test predicts sepsis with over 90 per cent accuracy

“Sepsis was the cause of death from the COVID-19 pandemic and will be the cause of death in the next pandemic. ...If we're going to guard our present and our future, we really need to start to dig into this disease in great detail.
-Bob Hancock”

AWARDS

Congratulations to our students and faculty who have been recognized with recent awards! These include:



Maria Tokuyama
Assistant Professor

**Lupus Research Alliance's
Lupus Innovation Award**

For her work developing a cell therapy to treat autoimmune activity toward endogenous retrovirus proteins



Brett Finlay
Professor

**John McNeill Excellence in Health
Research Mentorship Award**

For his deep commitment to fostering the professional and personal development of early-stage academic researchers



Evelyn Sun
*Assistant Professor of Teaching
Recipient of the 2023-2024
Killam Teaching Prize*



Kabir Bhalla
*Graduate student
Recipient of the 2024-2025
Killam Graduate Teaching Assistant Award*

UBC's Killam Awards

*For excellence in teaching
in the classroom and the lab*



Thomas Worthington
*2023-2024 fellowship recipient
Studying the role of viral infections
in the onset of autoimmune diseases
(Horwitz lab)*



Xianya Qu
*2024-2025 fellowship recipient
Studying mechanisms of drug resistance by
the fungus *Cryptococcus neoformans*
(Kronstad lab)*

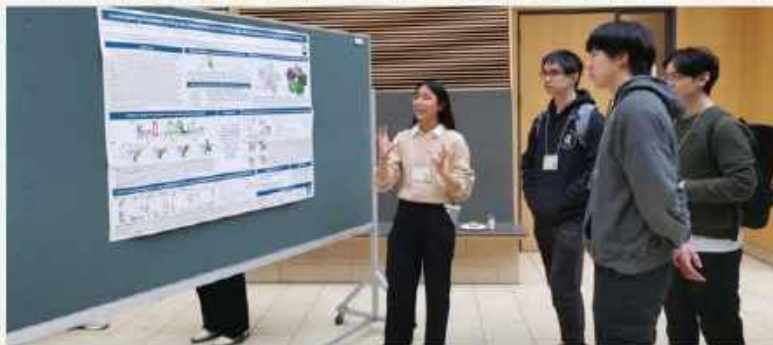
Zymeworks Fellowship

*To support graduate
students pursuing
immunotherapy research*

EVENTS

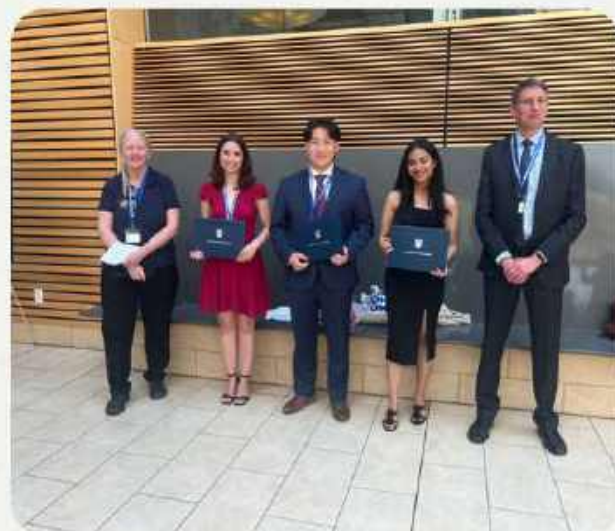


Throughout the past academic year, we have enjoyed learning about interesting research at our MBIM seminar series and gathering for a variety of social, professional development, Equity, Diversity and Inclusion (EDI), and teaching and learning events.



- **IMAGINE DAY**
September 3, 2024
- **WELCOME BACK**
September 9, 2024
- **LET'S TALK EDI: NATIONAL DAY OF TRUTH AND RECONCILIATION**
October 10, 2024
- **HOLIDAY PARTY**
November 30, 2024
- **MISA CAREERS NIGHT**
March 13, 2025
- **LET'S TALK EDI: NEUROINCLUSIVITY IN ACADEMIA**
March 27, 2025
- **UNDERGRADUATE RESEARCH SYMPOSIUM**
April 28, 2025
- **TEACHING AND LEARNING SYMPOSIUM**
May 14, 2025
- **GRADUATION TEA**
May 27, 2025

ALUMNI



We had a wonderful time celebrating the close-knit community of the class of 2025 at our Graduation Tea on May 27. We have also enjoyed welcoming back our alumni as seminar speakers and volunteers at networking events hosted by the undergraduate Microbiology and Immunology Student Association (MISA) and the Microbiology and Immunology Graduate Student Society (MIGSS). We look forward to keeping in touch with our newest cohort of alumni!



- Email our communications coordinator Sarah Anderson (s.anderson@ubc.ca) to share your post-grad experience for promotion
- Attend our events
- Support our dedicated scholarship funds
- Keep your contact information up-to-date with UBC Alumni Affairs
- For MBIM updates, visit our Instagram, X/BlueSky, and website

We live and work on the traditional, ancestral and unceded territory of the xʷməθkʷəy̓əm (Musqueam) People of the River Grass.