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Department of Biochemistry, Microbiology and Immunology

Annual Newsletter

This issue:

Message from the Department Head - Part 1

Dr. Bill Roesler

As of June 30th, I have stepped down as Head of the Department of Biochemistry, Microbiology & Immunology, a position I have held since the department's inception in 2018. Reflecting on the past six years, I am filled with pride and gratitude for the remarkable journey we have undertaken together.

The formation of our department through the merger of the Departments of Biochemistry and Microbiology & Immunology presented both challenges and opportunities. One of the most significant changes was the rejuvenation of our faculty. The retirement of six experienced members initially posed challenges, particularly in fulfilling our teaching mandate. However, the recruitment of six new faculty members has more than compensated for this loss. These new recruits have not only enhanced our teaching and research missions but have also brought fresh perspectives that have positively influenced our department's trajectory.

Merging two distinct units often comes with the challenge of integrating different cultures and practices. Our new faculty members, unburdened by past practices, saw the merger as an opportunity to foster a multidisciplinary environment. Their fresh outlook helped us focus on the critical issues that needed to be addressed, enabling us to move forward productively.

Our undergraduate program has undergone significant transformation over the past six years. We introduced a new Bachelor of Science in Biomedical Sciences through a pioneering partnership between the Colleges of Arts & Science and Medicine. Instead of retaining separate majors in Biochemistry and Microbiology & Immunology, we now offer a single, integrated major that encompasses both disciplines. This program provides flexibility for students to focus on either Biochemistry or Microbiology & Immunology, or to integrate both fields. We have also revised existing courses and introduced new ones on topics such as Vaccinology, Microbiomes, and Anti-Microbial Resistance, with significant contributions from our new faculty members.

The department's research funding and outputs have seen substantial growth since the merger. We now have nine faculty members with CIHR funding, more than doubling our numbers since the merger. This success is largely due to our outstanding new recruits, all of whom have secured Tri-Agency funding, with four securing CIHR program grants. The increased research activity has also expanded opportunities for graduate-level training, leading to a significant rise in the number of graduate students, particularly at the PhD level.

I would like to highlight our strengthened partnership with VIDO. Over the years, several of our faculty have conducted research within VIDO's facilities. Recently, we have intensified our efforts to collaborate more closely. Andrew van Kessel, VIDO's Director of Research, and I have held quarterly meetings to explore collaborative opportunities, strategize new initiatives, and address challenges. These efforts have resulted in several CIHR-funded projects involving both VIDO and BMI scientists. Additionally, at least eight VIDO scientists hold adjunct professor appointments in our department, enriching our undergraduate and graduate programs. I am confident that our partnership with VIDO will continue to thrive and benefit both parties.

While much of this message has focused on faculty contributions, I need also to acknowledge the invaluable role of our administrative team and laboratory staff. Their often-unseen efforts are crucial in creating a positive student experience and facilitating the research, teaching, and administrative activities of our faculty and enriching the educational experience of our students. It has been a privilege to work alongside such a dedicated and supportive group of individuals.

In closing, I want to thank faculty and staff for their hard work and dedication. I also want to thank our students for the privilege of being part of their education and development. It has been an honor to serve as the inaugural department head of such a dynamic collegial group of people, and I look forward to seeing the continued success of the department.

Message from the Department Head - Part 2

Dr. Linda Chelico

"We are excited to share the wonderful news that Linda and her family have welcomed a baby boy, Zain, on October 13th. Linda will be on parental leave from October through February as she spends this special time with her family."

As of July 1, I became the Head of the Department of Biochemistry, Microbiology & Immunology (BMI). Since the department's inception in 2018, I served as Assistant Department Head. I am grateful for the lessons I learned from our outgoing head, Bill Roesler, and the work he did to form a strong department. I will continue to learn from Bill since he has stayed with the department and will continue in his academic role where he makes strong contributions to teaching in our undergraduate program.

The immense faculty renewal that our department went through in the last six years has set the stage for the next phase in the department, enhancing our research potential. This is an initiative that I am very excited to lead, and it will involve several distinct elements:

- With the new faculty hires starting new research programs, our graduate student numbers have risen to an all-time high, with over 50 enrolled graduate students training in labs to obtain M.Sc. or Ph.D degrees. We will be developing a new graduate student course required for all incoming BMI graduate students that will train them in how to discuss, present, and write about their research as well as provide opportunities for professional development.

- Most of our faculty are running research labs with staff and students. These are funded by provincial, federal, or non-governmental organizations. Although BMI has been very successful in obtaining funding in recent years, this funding only supports day-to-day research costs of supplies and salaries. It is becoming increasingly difficult to obtain funding for research equipment. This equipment ages as everything else, goes off warranty, breaks down, or the technology becomes obsolete. Renewal of research equipment has become a top priority in regards to how we can fund these essential pieces of our research that are used collectively by many researchers in BMI and College of Medicine. BMI will be actively campaigning for private and corporate funding to support research equipment renewal.

- Part of our campaign for private and corporate funding is to continually let the community know what we are doing. The BMI department started a LinkedIn page to develop a relationship with our larger community, highlight the research successes of faculty, and create a culture of celebration. I find too often that our accomplishments as researchers, obtaining research funding, publishing research papers, giving seminars, and national leadership roles are not celebrated enough. Every day our faculty are making strides to building a foundation for better health. Our biomedical scientists ask the questions and find the answers that improve the health and well-being of the people of Saskatchewan and the world. Join us on the BMI LinkedIn page to see what we are up to and how much we have to celebrate.

I look forward to updating our community on these new initiatives in the next year. For now, I invite you to read our newsletter to learn of the research and academic accomplishments made in the past year from faculty, graduate students, and undergraduate students.

Departing Employees

Kristen Brown resigned as BMSC's Academic Advisor to explore new adventures in Vancouver, BC.

She is now Coordinator of Executive Education at Simon Fraser University, Beedie School of Business. She works within program delivery for a corporate partnership with KPMG as well as a scientific research-based program that fosters science and technology commercialization.

Kristen states that she enjoyed contributing to the exciting introduction of the new majors and the BSc BMSC program which was a significant time after the department merger. Although she is settling into her new role, she wanted to pass along that she will always miss the BMSC team and faculty, and she feels incredibly thankful for all that she learned and the working connections and friendships she developed in her five years at USask!

Robyn Claypool has also embarked on a different path - she still works for the University of Saskatchewan but in a new role with the Family Medicine Residency Program in Moose Jaw.

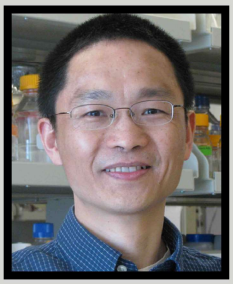
Robyn misses everyone in BMI and APP and says that her role as Department Head Assistant was such an incredible experience. She is enjoying Moose Jaw and all it has to offer and is excited for what the future has in store!

Thank you for your contributions to BMI!
We wish you both success in your future endeavors.

Tenure, Promotion, and Probationary Renewal

Promoted to **Professor:**
Scot Leary

Promoted to **Professor:**
Yuliang Wu



Promoted to **Associate Professor:**
Harold Bull and **Kerry Lavender**

Granted **Renewal of Probation:**
Jenny-Lee Thomassin

Granted **Tenure:**
Kerry Lavender

Granted **Renewal of Probation:**
Anil Kumar

Congratulations

Funding

Congratulations to all BMI faculty members who were awarded grants this past year! A few of the grants are highlighted below.

Jessica Sheldon received a 5-year CIHR grant for her work on an emerging pathogen and the effects of histamines. See related article here.

A special shout-out to Drs. Sheldon and Dong for obtaining a CIHR Project Grant on their first attempt!

Jeff Dong received a 5-year CIHR grant for his work on aging-related cell damage. See related article here. Jeff also received a grant from the US Department of Defense.

Linda Chelico received two 1-year Bridge Grants from CIHR. She also received funding from NIH as co-applicant.

Pete Pioli was awarded an NSERC Discovery Grant for his project The Use of Spectral Flow Cytometry to Understand Thymus Antibody-Secreting Cell Development and Function. He was also awarded an NSERC RTI Grant.

Joyce Wilson was awarded a 1-year CIHR-funded Bridge Grant.

Papers

Photo credit: USask/Matt Olson

Dr. Oleg Dmitriev (right) and Dr. Franco Vizeacoumar (left)

Dr. Oleg Dmitriev (right), a professor in BMI, and **Dr. Franco Vizeacoumar** (left), a professor of oncology at USask, were recognized for a recent *eLife* paper published with their lab members and collaborators from the United States. The findings reported in the paper may lead to a new cancer treatment.

The team discovered that a cell protein called MEMO1 binds iron and regulates iron flow in the cell. Although it is just one of many proteins involved in balancing iron in the cell, MEMO1 directly links iron metabolism and cancer metastatasis. Using genome wide association studies, Dmitriev, Vizeacoumar, and their colleagues plan to determine the core function of MEMO1 and identify other proteins that work in conjunction with MEMO1.

The end goal is to create drugs that target MEMO1, and/or its partners, in cancer treatment. In the article, Dmitriev states, "…many anticancer drugs are very powerful but also terribly toxic." Selectively targeting a drug treatment towards the cells producing large amounts of MEMO1 can allow using much lower drug doses, alleviating severe side effects of cancer chemotherapy.

Dmitriev stressed the importance of combining expert knowledge from across scientific disciplines to solve complex problems, and he praised his colleagues for their contributions to this important work that has high potential to contribute to the treatment of cancer.

For more information, please visit the original news article or the *eLife* research article.

Awards

Dr. Bill Roesler

CoM Faculty Leadership Excellence Award

The award recognizes an individual faculty member who has shown outstanding leadership and achievements while exhibiting care in building a healthy workplace, teams, and citizens.

Dr. Roesler was recognized for his unwavering commitment, his leadership in transitioning to a single department, his humility, mentorship, and deep sense of responsibility and care of his department members.

Dr. Kyle Anderson

CoM Excellence in Teaching Award

This award recognizes individuals who have made significant contributions to the teaching mission of the College of Medicine and are acknowledged by their peers and students as being exceptional in practicing their art and craft.

Dr. Anderson was recognized for the care and effort he puts into his teaching, his ability to engage students and build rapport, his use of technology and innovative methods, and his leadership in educational administration.

Dr. Anderson was also nominated for a USSU Teaching Award this year.

Dr. Scott Napper

Provost's Award for Collaborative Teaching and Learning

This award recognizes a team of two or more instructors involved in the successful delivery of a collaborative and curricular teaching and learning initiative.

Dr. Napper, along with Drs. Erika Dyck and Simonne Horwitz from the Department of History in the College of Arts and Science, were recognized for their creation and delivery of the course History of Infectious Diseases and Vaccination (HIST 237).

Dr. Napper was also nominated for a USSU Teaching Award this year.

"Too often I see people take the approach of 'once I succeed then I will be happy.' This is completely backwards. Don't postpone happiness, seek it out and be fueled by it. Once you are motivated by your passions, rather than your fears, success is a certainty." ~ Dr. Napper

A+

Eric Luo (above) won the Dorothy Kline (Top Mark in BMSC 200) Award

Jian Park (right) won the Dorothy Kline (Top Mark in BMSC 230) Award

The following students were awarded an NSERC Undergraduate Student Research Award (USRA)

Student	Supervisor
Rylan Bahrey	Aaron White (VIDO)
Anton Dmitriev	Jenny Wachter (VIDO)
Ethan Done	Jo-Anne Dillon
Eric Luo	Jenny Wachter (VIDO)
Allison Novecosky	Wei Xiao
Jian Park	Jeff Dong
Keisha Singh	Jo-Anne Dillon
Kenny Ta	Jeff Dong
Maria Zafar	Yuliang Wu

The Graduation Banquet for our Undergraduate Students was Held in 2024 after a Hiatus

Students in attendance at the Banquet

Award Recipients:

Delbaere Memorial
Rowen Greene

JF Morgan Top Graduate
Morgan Beattie

Most Outstanding Grad in BMI
Deborah Achuonye

L to R: R. Greene, M. Beattie, D. Achuonye, Dr. K. Anderson (presenter)

CIHR Master's CGS-M Scholarship Recipients

Marin Habbick

Emily Hein

Nathan Seidel

NSERC Master's CGS-M Scholarship Recipient

Eric Toombs

Congratulations to <u>all</u> students who were awarded scholarships or awards this past year!

Magen Francis, a PhD student, was awarded the **Irene Grodums Memorial Scholarship**.

Sampurna Ghosh, a PhD student, won best poster award at the Mitochondria and Chloroplasts Gordon Research Conference satellite meeting (which is a prequel to the actual meeting attended by trainees and PDFs) which was held in Barcelona, Spain in July 2024.

Hannah Braun, PhD student, was awarded a **USask Dean's Doctoral Award** and **The Canadian Federation of University Women (CFUW) Bennee Scholarship.**

CGPS 75th Anniversary Scholarship Awardees:
Rylan Bahrey
Griffin Lehnert
Michael Flaman
Annie Ain
Enrique Aburto Arreguin

Congrats!

This past May, the CIHR Institute of Infection and Immunity (CIHR-III) team visited USask for some Institute Advisory Board (IAB) meetings. During their visit, BMI co-hosted a well-attended community engagement event for the local research community. For more information, please visit Recap of CIHR-III Activities in Saskatoon, Saskatchewan.

Kyle Anderson was an invited guest of the podcast "Beyond the Teacher". You can listen to it here.

Linda Chelico presented a TEDx talk that was selected by TEDx to be a promoted video; it has reached over 27,000 views.
Watch it here!

Jo-Anne Dillon is President of the International Union against Sexually Transmitted Infections.
She was co-President of the IUSTI 2024 meeting in Sydney, Australia, this September and is co-President of the upcoming STI and HIV World Congress which will be held in Montreal in July 2025.

Jenny-Lee Thomassin organized the 11th Annual Protein Structure, Function and Malfunction (PSFaM) Conference in June 2024.
We reached a new record for enrollment! Check out the website here for information on PRISM and watch for information on the 2025 Conference.

CURRICULUM RENEWAL

A couple of years ago the department started the process of Curriculum Renewal which involved a mapping exercise where we determined what our program objectives and outcomes were and then assessed how well the outcomes of our individual courses matched with these. It was a very enlightening experience, and several tangibles resulted from it including the development of several new courses.

Previously, third year students who were interested in more advanced study of bacteriology and virology took BMIS 308, which was a 3 cu course intended to provide prerequisite knowledge for 4th year courses that focused specifically on bacterial pathogenesis (BMIS 425) or virology (BMIS 417). It became quickly evident that trying to cover foundational knowledge in both bacteriology and virology in a single 3 cu course was not possible, and a group of faculty members were assigned the task of addressing this issue. Out of their discussions came two new 3rd year courses.

An introductory virology class (**BMIS 317**) was delivered for the first time in the fall of 2024 which provides enhanced foundational knowledge on viruses to better equip students to discuss higher level topics in virology at the 4th year level. In this course, students learn how viruses infect cells and hijack them to create more viruses, and how we defend ourselves against viruses. Students examine the basic techniques used to study viruses and how they can be engineered as tools, and they explore current outbreaks of viral infections and how they are managed.

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The other course developed was **BMIS 325** which addresses the fundamentals of bacteriology. This course explores how bacteria perform essential functions and adapt to diverse environments. Students learn about the bacterial cell envelope and surface, import and export of nutrients and macromolecules, regulation of gene expression and processes, and how bacteria generate specialized cellular forms. They also gain an understanding of how bacterial processes are relevant for human health and biotechnology, such as the development of new antibiotics and vaccines.

In addition to these two 3rd year courses, another new 3rd year course was added to our offerings. **BMIS 319** (Vaccinology: Principles and Practise) was offered for this first time in the fall of 2024. This course provides a multidisciplinary introduction to vaccinology including historical perspectives on the emergence and evolution of vaccines, modern strategies of vaccine development, formulation and delivery, as well as processes of vaccine licensing and manufacturing. This course was developed by Scott Napper and is delivered with contributions by several scientists at the Vaccine and Infectious Disease Organization (VIDO), one of the premier vaccine research institutes in North America, and one of the unique strengths of USask. Given the expertise available at VIDO, and its close relationship with BMI, this course provides an ideal opportunity to create a learning experience in which our students receive training in all aspects of vaccine development from scientists working at the cutting edge of vaccinology.

New Courses / Department Events

Our curriculum renewal did not stop at the development of the 3rd year courses highlighted on the previous page. Two new 4th year courses have also been developed:

BMIS 498/VTMC 898 - Molecular Basis of Symbiosis and Microbiomes
This is a new offering that covers the molecular bases – the proteins and small molecules – that define mutualistic relationships between microbes and higher organisms. The course provides insights from historical and ongoing studies that have advanced our knowledge of bacterial symbionts and how these organisms interact with animals. Building from the introduction of these seemingly simple yet complex relationships, the course extends to our current understanding of how complex microbial communities are assembled and impact host health and disease. We thank Tony Ruzzini, a faculty member in Veterinary Microbiology and an adjunct faculty member in our department, for making this interesting course available to our students.

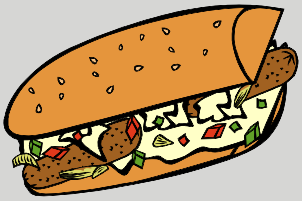
BMIS 498/898 - Antimicrobial Resistance of One Health Pathogens
A new course on Antimicrobial Resistance (AMR) of One Health Pathogens has been developed by one of our newer faculty members, Jess Sheldon; this course is available to both 4th year undergraduate and graduate students. It covers topics that include antibiotic discovery and development, mechanisms of resistance, emerging threats, surveillance and transmission of AMR in the environment, and novel treatment strategies. Given the importance of AMR to the health of people around the world, we anticipate that the demand for this course will be high.

BMI Grad Student Come'n'Go Welcome Lunch

The BMI Grad Student's Association (BMIGSA) held a Come'n'Go Welcome Lunch on September 18, 2024. It was a success with some faculty and staff attending as well. There was mingling and games and great food!

Thank you, BMIGSA!

BMIGSA Executive



Some of the event attendees

Meet the 2024-2025 BMI Graduate Student Association (GSA) Executive

Nayoung Kim, President

Nayoung Kim is a PhD candidate in Dr. Kiven Erique Lukong's lab. Her research is centered around a relatively understudied protein known as SRMS and to gain a better understanding of its cellular and functional role by studying its proximity partners using BioID.
Nayoung is excited and looking forward to representing the BMI graduate students!

Paria Nouri, Vice-President

Paria is currently pursuing her PhD in the BMI program, where she studies the molecular function of MEMO1, a molecule linked to cancer progression. Paria is honored to be a part of the BMI Graduate Student Association. The association is dedicated to enhancing the student experience by fostering a vibrant, inclusive, and supportive community.
She looks forward to seeing you all soon!

Anna Martens-Koop, Co-Chair

Anna is honoured to be co-chair for the BMIGSA 2024-2025. Her research is focused on the development of a novel vaccine for Tuberculosis, and she is situated in the Laboratory of Vaccine Engineering and Immunology (LVEI) located in the Vaccine and Infectious Disease Organization (VIDO). She is excited to put together some fun events for all BMI graduate students this year and can't wait to get to know everyone better!

Marin Habbick, Co-Chair

Marin Habbick is a virologist in training entering her second year as a Master's student in Dr. Angela Rasmussen's lab. Her research focuses on understanding the role sex hormones play in determining human coronavirus disease severity. Marin's work takes a combined experimental and computational approach, training in both the wet lab and in omics analysis.

Meet the 2024-2025 BMI Undergraduate Student Association (BMISA) Executive

Farhan, President

Farhan is in his 4th year with BMI. He says that the BMISA has lots of events planned and he looks forward to meeting everyone, hosting some fun events, and having a great year with the BMISA!

Thanisha, Vice-President

Thanisha is a 3rd-year BMI honour's student. This is her first leadership position, and she is excited for the experiences the role will bring. She feels honoured to be working with the BMISA team.

Weixi, Treasurer

Weixi is in her second year of Biomedical Sciences. She wants to give back to the community, so she is grateful to be a part of the BMISA and the wonderful community of students and faculty.

Jill, Secretary

Jill is in her last year of the BMI Honour's program. She is Métis and has a leadership role as Student Director for the Indigenous Business Student Society.

Ally, Events Coordinator

Ally is a 3rd-year BMI student. She has a passion to get involved and create communities and so she is thrilled to be working with the BMISA this year!

Jeshua, Events Coordinator

Jeshua is in his 2nd year of Biomedical Sciences and is excited to be on the BMISA. He hopes everyone enjoys the events they have planned and invites everyone to reach out to him with any feedback or just to say hi!

Josh, 2nd-Year Rep

Josh is a 2nd-year BMSC student. He looks forward to meeting everyone. Building community is important to Josh, and he is excited to be involved in that this year with the BMISA!

Carly Jo, 3rd-Year Rep

Carly Jo is in her 3rd year of BMI and is an advocate for young adults to come together and build relationships with one another so being a part of the BMISA is really important to her.