

DEPARTMENT OF BIOCHEMISTRY, MICROBIOLOGY &amp; IMMUNOLOGY

# ANNUAL NEWSLETTER

ISSUE 5 • FALL 2023

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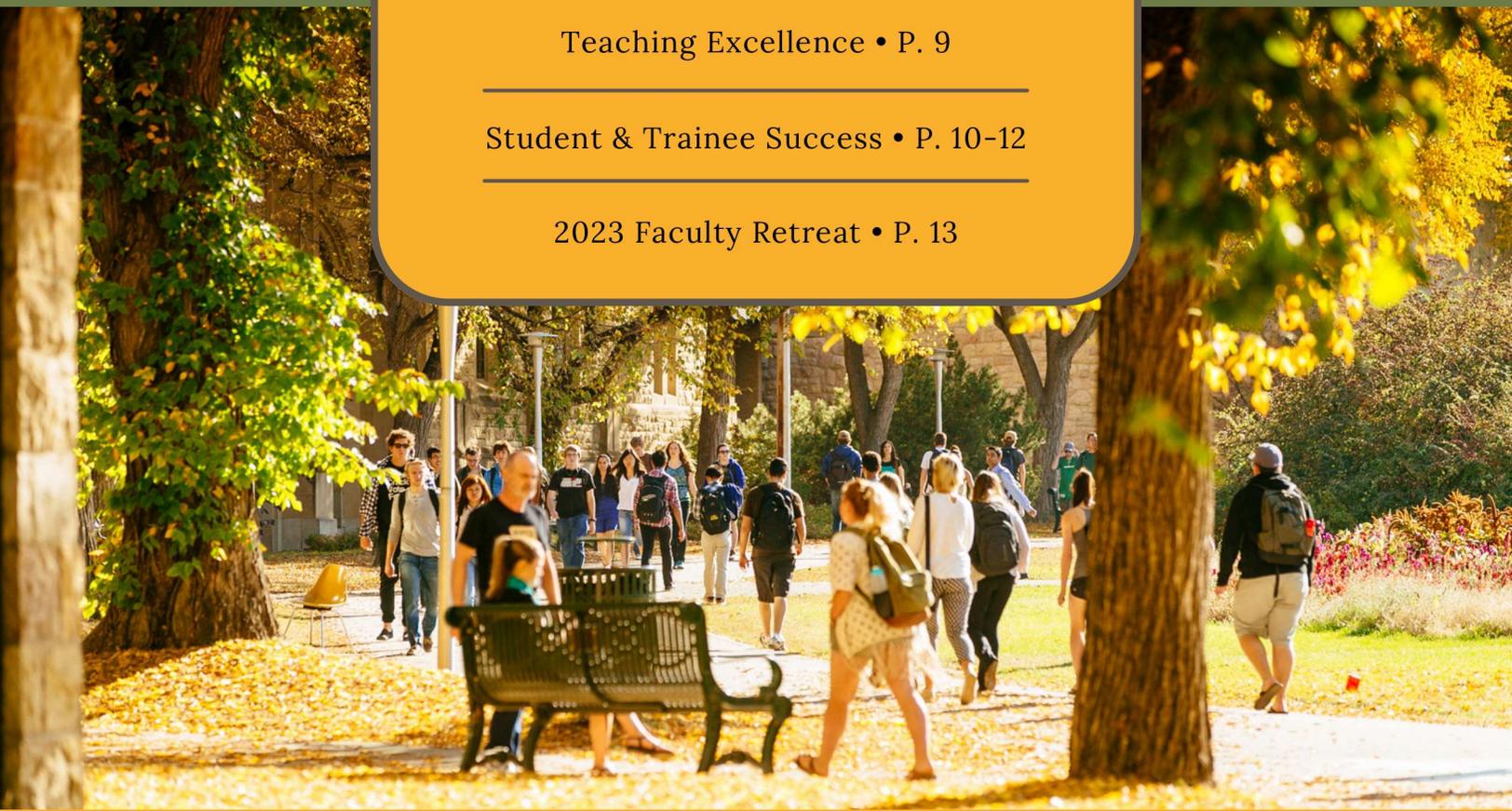
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# MESSAGE FROM THE DEPARTMENT HEAD



**BILL ROESLER**

This 5th annual BMI newsletter is a pleasure to present as it serves as a vital communication tool for our USask community including past and present students and retired colleagues. We have received many notes of thanks from those on our mailing list for these annual newsletters for keeping them “in the loop” on the activities and successes of our department.

The past year marked a return to “normalcy” after the pandemic’s disruption. It was both a pleasure and somewhat of a relief to engage in-person with students and colleagues. I came to realize that the absence of in-person classes for two years had a significant impact on building relationships with students, especially in my 400-level courses.

Normally, by this stage, I recognize most fourth-year students and have come to know many of them personally. Last year, this wasn’t the case, and it took time for us to connect. However, I am optimistic about this year. We have the foundation of the previous year to build upon, and our department has committed to fostering stronger connections. One such initiative is that we have appointed a faculty member to serve as a “student liaison” who will engage with students to plan events that facilitate interactions with faculty and staff. This proactive approach should help bridge the gap created by the pandemic, allowing us to forge meaningful relationships with our students once again.

It is with mixed emotions that we note in this newsletter the retirement of two esteemed faculty members from our university who provided a combined 86 years of service to USask. Their dedication and service to our institution have been invaluable and we are deeply grateful for their contributions over the years. Their experience and expertise are not easily replaced, and they leave behind a legacy that will be remembered for years to come.

Over the past year, a major focus of our department has been the comprehensive task of curriculum renewal. This vital initiative kicked off with a thorough examination of the program outcomes we aspired for our undergraduate students to achieve. We then embarked on the process of mapping our existing courses to gauge their effectiveness in aligning with these desired outcomes. Guiding us through this transformative journey was an expert from the Gwenna Moss Teaching and Learning Centre, whose facilitation added invaluable insights to our efforts. The impact of this process promises to be enlightening for our department and immensely beneficial for our students.

As we transition into the current academic year, our commitment to curriculum enhancement remains unwavering. We are taking further steps by establishing focus groups tasked with critically reviewing the content of our courses. This evaluation will determine whether we need to revise, add, or delete courses to ensure the continued vibrancy and currency of our offerings.

Simultaneously, our department is staying proactive and responsive to the evolving academic landscape. We’ve introduced two new senior level courses this year and a third will be piloted next year that are not only timely but also of broad interest and relevance. These courses delve into critical areas such as antimicrobial resistance, vaccinology, and the intricacies of the microbiome. These additions reflect our dedication to providing students with cutting-edge knowledge and preparing them to tackle the challenges of today’s world.

In closing, I trust that you find our annual report both informative and inspiring. The accomplishments of the past year reflect our unwavering commitment to excellence in all that we do whether academic or research related. Happy reading!

# DEPARTMENT NEWS

## SPOTLIGHT ON NEW EMPLOYEES



### VIELLA DESPEDA

Join us in welcoming Viella, our newest team member, back to Saskatchewan! With previous roles as a Registration Clerk at SHA, covering Adult and Peds Outpatient, Day Surgery, and both Adult and Peds Emergency and as an Administrative Assistant for the Saskatchewan Bleeding Disorders Program, she brings invaluable experience to our office. Viella was also a Ward Clerk at GGH in Ontario, handling Maternal, NICU, Medicine, and Surgery departments. Now, she is also pursuing a Project Management Certification. Beyond work, Viella finds joy in poetry books and has a soft spot for Milkco cookies.



### VALERIE LIPTON



Valerie was born in Florida but grew up in Montreal where she obtained her D.E.C. in Health Science as well as her Bachelor of Science degree in Biology and Graduate Diploma in Ecotoxicology. Valerie has moved all throughout Canada from six provinces to one territory

but plans on making Saskatchewan her permanent home. Valerie taught both the University of Saskatchewan and University of Regina Biology as well as Chemistry labs to nursing students in Buffalo Narrows, SK, for over four years. Valerie is excited to be back working with students as it is her passion. Valerie has been married for nearly 30 years and has two sons who will be attending the University of Saskatchewan. Valerie loves to watch movies, to go for long walks with her family, and music.

### ROBYN CLAYPOOL

Robyn started with the College of Medicine, working for both APP and BMI in 2021 when she was planning her move from Vancouver to Saskatoon. She was promoted to Department Head Assistant in May 2023. Since then, she has enjoyed her time with the University and doesn't even hate the prairie winters (yet). Her current hobbies include crocheting, writing, reading and going to Taylor Swift concerts. She is nearly finished with the Certificate in Business and looks forward to what the future may bring.



# DEPARTMENT NEWS

## RETIREMENTS

### SIDNEY HAYES

The research career of Sidney Hayes spans from entering graduate school in June of 1964, earning M.S. in Microbiology in 1966 followed by a PhD program at Oregon Medical Center in Portland. His postdoctoral research began in 1970 and was carried out in Madison at the University of Wisconsin.



In September of 1974 he was hired as an assistant professor in the Department of Molecular Biology and Biochemistry, University of California, Irvine, and a few years later was subsequently invited to join the Department of Microbiology, within the University of Saskatchewan College of Medicine in Saskatoon as an associate professor. Four years later he was promoted to Professor, and he served one term as Head of the Department of Microbiology and Immunology prior to its merger with Biochemistry.

Aside from developing and validating a short-term mutagenesis assay system as an alternative to animal testing for the discovery of carcinogens and showing the effect of low dose ethanol exposure in stimulating deletion formation, his research has involved Small RNA Silencing of Replication and Gene Expression. A more recent focus has been on Phage Display and Phage Vaccine Development. The vaccine development studies have been in collaboration with US Naval Medical Research and the WCVI and VIDO at USask.

Sid will be greatly missed; his passion for research was an inspiration to all who interacted with him.

### RAMJI KHANDLWAL

Dr. Ramji Khandelwal retired from the University of Saskatchewan after 43 years of service. He joined the Department of Biochemistry in 1980 as an Associate Professor. Prior to this, he did his Ph.D. from the University of Manitoba and was also employed there as an Assistant Professor (MRC Scholar) for 5 years. He did his Post-doctoral training under the supervision of Nobel Laureate Dr. Edwin G. Krebs at the University of California Davis. At U of S, he established a successful and vibrant research program, enjoyed teaching, and participated in many administrative duties. His initial research program dealt with the regulation of liver glycogen metabolism and



its aberration in diabetes. This led to further delineation of insulin signaling pathway involving phosphorylation/dephosphorylation of several proteins by protein kinases and protein phosphatases. His research program was primarily funded by the Medical Research Council of Canada, Canadian Institute of Health Research, Canadian Diabetes Association and the Heart and Stroke Foundation of Canada. He published extensively in reputable Biochemistry journals (115 articles in total) and trained 42 graduate students and postdoctoral fellows.

He taught many undergraduate and graduate courses over the years in our Biochemistry program. He was well liked and appreciated by his students. He was mainly involved with Introductory (Biomolecules and Metabolism), Advanced Metabolism, Enzymes and other courses dealing with current topics in Biochemistry.

He was an active member of many administrative committees at all levels of governance. He served as Department Head for 9 years, Graduate Chair for 11 years and was a member of several major committees including Capital Planning Committee, Budget Committee, International Committee, Planning and Priorities Committee, Scholarships and awards committee, University Review committee and many Appeals committees dealing with students, faculty, and others.

The Department was proud to have a colleague like Ramji who contributed tremendously to the welfare of the Department, College, and the University. We will miss him and wish him all the best in his retirement.

# RESEARCH SUCCESS

## JEFF DONG



Jeff Dong, the newest faculty member in the department, experienced tremendous research funding success over the past year. He was awarded four different research grants from both provincial and national funding agencies. This included a Biomedical Establishment grant from the Saskatchewan Health Research foundation that focuses on unraveling the impact of aging on oxidative injury in the progression of multiple sclerosis (MS); a MS Society grant that focuses on the role of a specific protein, osteopontin, in MS; an NSERC Discovery grant that aims to understand how macrophages react to toxic phospholipids; and a Future Leaders in Canadian Brain research grant. Jeff is off to a great start here at USask and we look forward to his many contributions to the Department in the years to come.

## OLEG DMITRIEV

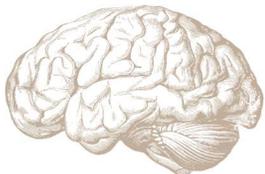


Led by Principal Investigator Oleg Dmitriev, this groundbreaking project aims to revolutionize treatment for prostate cancer patients. Supported by the TELUS Ride for Dad and the Prostate Cancer Fight Foundation, the research has received special funding through the Ride for Dad program.

## SCOT LEARY



Dr. Scot Leary received \$100,000 for a one-year project bridge from CIHR for his project - *"Disrupting mitochondrial function in the liver: implications for immune suppression"*



## KERRY LAVENDER

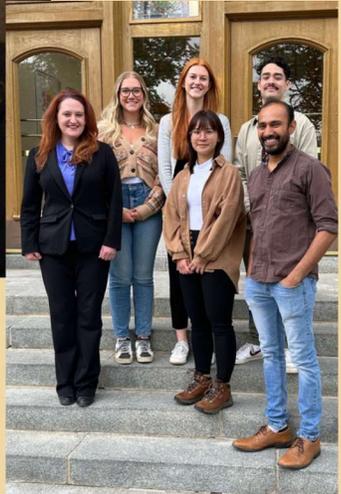
Kerry Lavender is a co-Principal Investigator on a New Frontiers in Research Fund - Exploration grant from the Tri-Agency Institutional Programs Secretariat. She and her collaborators from the University of Alberta will pursue the research project titled *"Understanding inflammation in the brain: Integration of glycomics and viruses in MS"*.





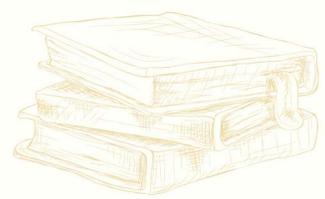
# RESEARCH SUCCESS

## JESSICA SHELDON



**SHRF Excellence Award for the top-ranked biomedical Establishment Grant**

Congratulations to Dr. Jessica Sheldon who received the SHRF EXCELLENCE AWARD BIOMEDICAL ESTABLISHMENT GRANT for her project entitled *"More Than Just an Allergy: How Histamine Impacts Infection by a Multi-Drug Resistant Pathogen"*



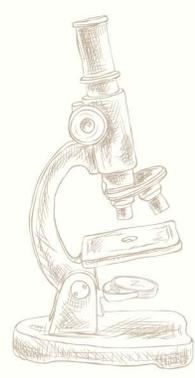
## SCOTT NAPPER & SIDNEY HAYES



Led by Drs. Scott Napper and Sidney Hayes, this research focuses on the investigation of chronic wasting disease. This study involves a multidisciplinary team from four esteemed Western Canadian universities, including VIDO scientists Dr. Napper, Dr. Griebel, and Dr. Tikoo. The team has received funding from NSERC to develop effective mitigation strategies for chronic wasting disease. To learn more about their work, visit: <http://bit.ly/3W0GYd8>.

## YULIANG WU

Led by Principal Investigator Yuliang Wu, this collaborative project aims to advance understanding and treatment of these challenging blood disorders. Supported by the Leukemia and Lymphoma Society of Canada, updates on this pioneering investigation will bring hope to those affected by MDS/AML.



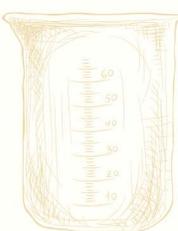
# RESEARCH SUCCESS



## WEI XIAO

Congratulations to Dr. Wei Xiao on his successful NSERC Alliance application! Dr. Xiao, serving as the Principal Investigator, has been awarded a generous grant of \$866,000 for his project titled "*Investigating and Applying the S Gene Strategy to Mitigate Clubroot Disease in Canola Using Advanced Genome Editing Technology.*" This ground-breaking research aims to combat clubroot disease in canola through innovative genome editing techniques. Dr. Xiao will be supported by a distinguished team of Co-Principal Investigators, including Y. Wei from USask and M. Kulka from the University of Alberta.

## JOYCE WILSON



Dr. Joyce Wilson was recently successful in being awarded a one-year CIHR Bridging grant for the project titled "*Reverse genetic analysis of mechanisms underlying convergent evolution of SARS-CoV-2 variants of concern and accessory protein functions.*" This grant aims to understand the development of significant SARS-CoV-2 variants and accessory protein functions.



## PETE PIOLI



Congratulations to Dr. Peter Pioli on securing the NIH - National Institute on Aging (NIA) R03 Grant for his project titled "*Development of an Inducible Conditional Gene Deletion Mouse Model to Study Plasma Cell Development and Longevity.*" The grant amounts to \$107,516 for a duration of 2 years.

In addition, Dr. Pioli was awarded the Travel for Techniques Award from the American Association of Immunologists (AAI). Dr. Pioli will be attending the University of Minnesota later this Fall to learn ultrasound-guided intrathymic injection. It's a technique that will be utilized to understand B cell and antibody-secreting cell tolerance in the thymus.



# HIGHLIGHTED PUBLICATIONS

## THYMUS ANTIBODY-SECRETING CELLS POSSESS AN INTERFERON GENE SIGNATURE AND ARE PREFERENTIALLY EXPANDED IN YOUNG FEMALE MICE



The Pioli lab published a manuscript in iScience titled "*Thymus antibody-secreting cells possess an interferon gene signature and are preferentially expanded in young female mice*". This work begins to unravel the details regarding the production and regulation of antibody-secreting cells in the thymus, a population linked to multiple autoimmune diseases including myasthenia gravis.

In conjunction, we synthesized the current state of the field regarding thymus antibody-secreting cells in an article (*Thymus antibody secreting cells: once forgotten but not lost*) published in Frontiers in Immunology. These works were collectively supported by a grant from the National Institutes of Health (NIH) and the National Institute on Aging (NIA).

## BIOFIL FORMATION AND ANTIMICROBIAL SUSCEPTIBILITY OF E. COLI ASSOCIATED WITH COLIBACILLOSIS OUTBREAKS IN BROILER CHICKENS FROM SASKATCHEWAN



AND

## HYBRID GENOME ASSEMBLIES OF 245 AVIAN AND BROILER BARN ENVIRONMENT-ASSOCIATED ESCHERICHIA COLI STRAINS ISOLATED FROM SASKATCHEWAN BROILER FARMS

Published by Dr. Jo-Anne Dillon and Dr. Aaron white

These two papers were published in June 2022 and April 2023 respectively, as part of an industry-funded project to collect, characterize and better understand the *E. coli* isolates that cause disease on Saskatchewan broiler farms.

*Escherichia coli* infections in poultry cause significant morbidity and economic losses for producers each year. The infections are called "colibacillosis" which is the #1 bacterial disease in poultry worldwide.

Over the past 3-years, they collected and sequenced the whole genomes of *E. coli* disease isolates, isolates from presumed healthy birds, and isolates from 8 barn sites on broiler farms in Saskatchewan.

Their research shows that the disease isolates cluster out as a unique group. They are currently working to analyze the genomes for AMR, virulence genes and plasmid content to try to understand what makes the disease isolates unique.



## MITOCHONDRIAL DYSFUNCTION REACTIVATES ALPHA-FETOPROTEIN EXPRESSION THAT DRIVES COPPER-DEPENDENT IMMUNOSUPPRESSION IN MITOCHONDRIAL DISEASE MODELS

Senior Author: Scot Leary

Mitochondria are compartments within a cell that are most widely recognized for their essential role in producing the energy we need to stay alive. Over the last twenty plus years, however, discoveries have been made that emphasize a broader role for mitochondria in preserving normal cell biology. This realization along with an appreciation of how common mitochondrial diseases are found within our population (estimated at ~1 in 3,000 live births) has led to a renaissance in mitochondrial research intensity. This recently published paper by the Leary lab in the **Journal of Clinical Investigation** used a suite of mouse models of mitochondrial disease to uncover that the liver, upon experiencing chronic loss of mitochondrial function, secretes a protein into the general circulation that then acts systemically to suppress the function of the immune system. This novel finding may have significant implications for mitochondrial disease patient cohorts who suffer from chronic or recurrent infections, the underlying basis for which has remained poorly understood for many decades.



# TEACHING EXCELLENCE

"EDUCATION IS NOT THE FILLING OF A POT  
BUT THE LIGHTING OF A FIRE."  
- WILLIAM BUTLER YEATS

## SCOTT NAPPER



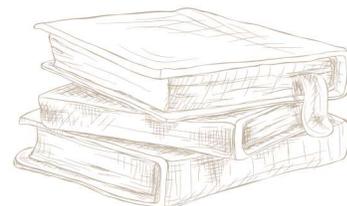
## WOJCIECH DAWICKI



Three faculty/staff members in the department were nominated for USSU Teaching Awards last year. Scott Napper, a perennial nominee, was nominated by students in BMSC 200 (Biomolecules) for providing an exceptional learning experience. Dr. Erique Lukong was nominated by students in BMIS 430 (Biochemistry of Cancer) for his dedication and passion education that was evident throughout his lectures. And Wojciech Dawicki, a laboratory coordinator, was nominated for his dedication to providing a positive student experience and mentorship in BMIS 340, a laboratory course that focuses on molecular biological techniques. While none ultimately received the award, we congratulate them for their outstanding commitment towards creating a rich learning experience for our students.



## ERIQUE LUKONG



# STUDENT & TRAINEE SUCCESS

## DEPARTMENTAL UNDERGRADUATE SCHOLARSHIPS



### DR. LOUIS T.J. DELBAERE MEMORIAL SCHOLARSHIP

This scholarship is awarded to a fourth-year student majoring in Biochemistry who has demonstrated the potential and interest to pursue a career in Biochemistry and is a \$2,000 award. This year's recipient was **Rebecca Iyoha**. Rebecca plans to find a full-time job working in a lab environment.



### DR. DOROTHY KLINE MEMORIAL SCHOLARSHIP

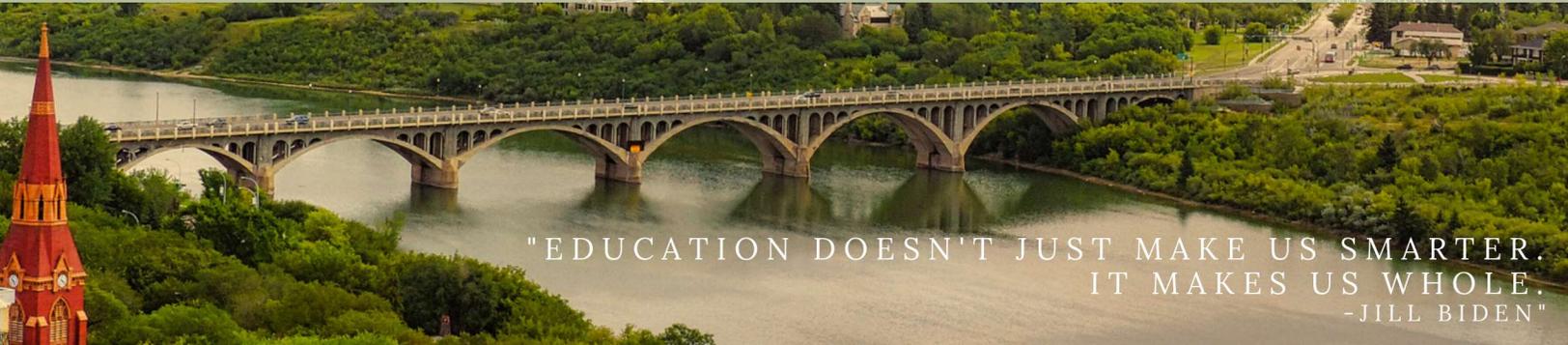
This scholarship is awarded to students majoring in BMI with the highest academic averages in BMSC 200 and BMSC 230. \$1000 award. This year's recipients are **Nathan Hickson (right) and Rylan Bahrey (left)**. Nathan is enjoying exploring Saskatoon as well as volunteering as a Worship Leader. Nathan is planning to follow a career path in medicine in cardiology or immunology. Rylan is in his 4th year of his BMI Honours Degree and plans to get his PhD in Microbiology with a career in research.



**Saurav Saswat Rout**, a graduate student supervised by Dr. Kerry Lavender, received an award at the The 30th Annual Life and Health Sciences Research Expo for the Best Translational, Clinical, or Applied Science Paper titled "*Distinct effects of treatment with two different interferon-alpha subtypes on HIV-1-associated T-cell activation and dysfunction in humanized mice.*"



**Megha Rohamere**, a graduate student supervised by Dr. Joyce Wilson received an award at the The 30th Annual Life and Health Sciences Research Expo for Basic Science 2 in the Research Presentation Award Competition as well as an award for COVID-19 Pandemic Research, Response, and/or Outreach.



"EDUCATION DOESN'T JUST MAKE US SMARTER.  
IT MAKES US WHOLE."  
-JILL BIDEN"

## UNDERGRADUATE CONVOCATION AWARDS

### MOST OUTSTANDING GRADUATE IN BMI

Recipient: **Tanvir Minhas**. Tanvir spent her summer in Calgary and travelling around Europe. She has started her first year of Medical School at McMaster University, Michael G. DeGroot School of Medicine



### JF MORGAN MEMORIAL AWARD

This award, given out annually to the most outstanding graduate in Microbiology & Immunology, was established by colleagues in the Microbiology department in 1977 after Dr. Morgan's untimely death a year earlier. This year's recipient was **Carlos Zapien Verdugo**. Carlos will be studying for a Doctor of Pharmacy degree at the University of Saskatchewan this fall. He is excited to continue being involved in research through his pharmacy studies to continue developing a broader and deeper understanding of the field, learn new research techniques, and refine existing skills learned with the goal to ultimately be able to apply these skills and knowledge to provide quality health care to patients and community.

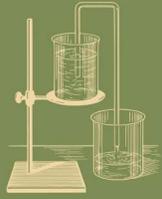


"TELL ME AND I FORGET. TEACH ME AND I REMEMBER. INVOLVE ME AND I LEARN."  
- BENJAMIN FRANKLIN

### NSERC UNDERGRADUATE STUDENT RESEARCH AWARDS

Join us in congratulating the four undergraduate students from the BMI program who received NSERC USRA's in 2023!

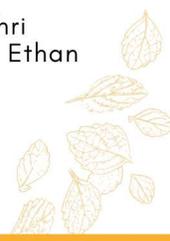
- Xinyeu (Susie) Xu
- Griffin Lehnert
- Alina Sami
- Kayla Abrametz



### 2022-2023 BMI GSA

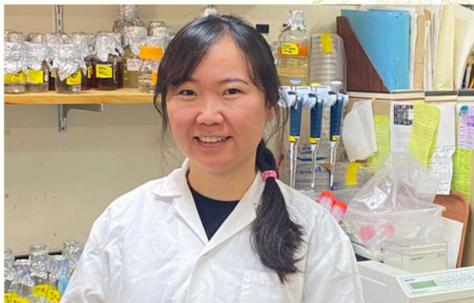
Thank you to the committee for their dedication to the BMI Department!

- President: Christopher Chivers
- Vice President: Maria Yousefi
- Co-Chairs: Shreeshri Bhattacharjee and Ethan Jansen



# STUDENT & TRAINEE SUCCESS

## IRENE GRODUMS MEMORIAL GRADUATE SCHOLARSHIP



This scholarship, valued at \$1000, is provided annually to a student pursuing a graduate degree in Microbiology & Immunology in recognition of academic excellence. This years recipient is **Li Fan**. Her future goals include delving deeper into the DNA damage tolerance pathway's connection to cancer, securing a postdoc in order to publish papers and ultimately pursuing a professor/researcher role.

## QUEEN ELIZABETH II CENTENNIAL ABORIGINAL SCHOLARSHIP

The Queen Elizabeth II Centennial Aboriginal Scholarship is a \$20,000 scholarship awarded annually on the basis of academic excellence to First Nations and Métis students pursuing graduate and post-graduate studies in any field at an accredited Saskatchewan university. This years recipient is **Michael Palmer**. Michael is currently working with Hepatitis C and related viruses, studying how they interact with their hosts. In addition, he works in a variety of fields, including virology, biochemistry and bioinformatics. In the future, Michael hopes to work in pharmaceuticals, primarily working towards developing treatments, cures and vaccines for many diseases



## CFUW BENNEE SCHOLARSHIP

The Benne Scholarship is an award provided by the Canadian Federation of University Women. This years recipients includes **Maddie Stewart**. This organization works to support and ensure that women have equal opportunities and equal access to quality education. Each year they award six female graduate students to support the completion of a thesis at the University of Saskatchewan. Upon completion of her degree, Maddie plans to continue in immunology research to help develop treatments for viral infections. In addition, she plans to become a science communicator, working to reduce barriers between the scientific community and general public.

## NSERC CGS-M AWARD



This award is provided to help develop research skills and assist in the training of highly qualified personnel by supporting students who demonstrate a high standard of achievement in undergraduate and early graduate studies. Recipient: **Hannah Braun**. Hannah is currently continuing her MSc program studying novel exoproteins of the type II secretion system in *Klebsiella pneumoniae*. She also plans on pursuing a PhD.



# FACULTY RETREAT 2023

We want to share the highlights of the BMI Faculty Retreat held at the picturesque Crossmount Cidery in Saskatoon on May 9. The day was filled with sunshine and delightful weather, setting the perfect backdrop for a productive and enjoyable gathering.



As the day unfolded, participants engaged in stimulating discussions, brainstorming sessions, and team-building activities. The serene surroundings of Crossmount Cidery served as a tranquil backdrop, creating a conducive atmosphere for creativity and reflection.

Faculty members from various disciplines came together to foster collaboration, exchange ideas, and strengthen the bonds within the BMI community. The retreat provided a unique opportunity for engagement, promoting a sense of unity and shared purpose among the attendees.



We extend our sincere gratitude to all the faculty members who contributed to the success of this retreat, making it a memorable and enriching experience for everyone involved. Together, we continue to foster a vibrant and supportive academic community within the BMI department.

