

DEPARTMENT OF BIOCHEMISTRY,  
MICROBIOLOGY & IMMUNOLOGY  
ANNUAL NEWSLETTER



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# MESSAGE FROM THE DEPARTMENT HEAD



Bill Roesler

I am pleased to be sending out our fourth annual newsletter, an initiative that began following the merger of the departments of Biochemistry and Microbiology & Immunology in 2018. From my perspective the merger has been very successful and I'm confident that you will come to the same conclusion as you browse through this newsletter and read about the activities and successes of our faculty, staff and students.

Faculty renewal continued to be the major focus of the department over the past year. Two more faculty retired, each of whom brought a wealth of knowledge to the classroom that provided rich experiences for our students. While their retirements are a significant loss for the department, the upside is that we have been able to recruit three exceptional new faculty members to the department since the last newsletter. Not only do all three have outstanding research track records and exciting research programs, there is every indication that they will also be highly effective and passionate teachers and mentors. Two of the new recruits work in the immunology field and the other in bacteriology, so our goal of beefing up our host-pathogen and immunology research areas is being realized. More retirements are expected

over the next few years, so we anticipate the revitalization of the department to continue.

Something that this newsletter attempts to feature more prominently than previous newsletters is the "extracurricular" and public service contributions that our faculty make to the broader scientific community and the public. While it is understandable that our newsletters highlight activities and successes related to teaching and research since it's something we spend a lot of our time at, we want our readers to appreciate the other ways that faculty share their time, expertise, and passions. These activities are mostly voluntary, and always very rewarding, and we are pleased to be able to share some of these with you in this newsletter.

As I'm writing this message, classes have just gotten underway this fall and it is wonderful to see so many bodies on campus after two years of COVID. The tents are up in the bowl, music is playing, and students are milling around going to their next class, familiarizing themselves with the campus, having coffee with their friends, or forging new friendships while tossing a football or frisbee around. It's great to see! We know that COVID has not gone away and there is some uncertainty on how this academic year will unfold regarding masking and vaccination rules. For now, it feels good to have some semblance of normalcy back. We know that the students in particular are happy to be back in the classroom and able to have in-person conversations with faculty, staff and each other.

I hope you enjoy reading this newsletter and appreciate any feedback you might have on how we can improve future editions.

# DEPARTMENT NEWS

## S P O T L I G H T O N N E W E M P L O Y E E S



### Jessica Sheldon

Jessica joined the department in April 2022 as an Assistant Professor. She earned her undergraduate and master's degrees from Lakehead University, then completed her PhD studies under the mentorship of Dr. David Heinrichs at the University of Western Ontario. For her postdoctoral research, Dr. Sheldon joined the lab of Dr. Eric Skaar at Vanderbilt University Medical Center. The overarching theme of Dr. Sheldon's research is investigating how nutrient acquisition in medically relevant bacteria contributes to their survival and pathogenesis within the host.

### Pete Pioli

Pete joined the department in April 2022 as an Assistant Professor. Before that, he completed his graduate and post-doctoral training at the University of Utah and the University of California-Los Angeles, respectively. The Pioli lab focuses on understanding the development and function of antibody-secreting cells, commonly referred to as plasma cells. Due to their longevity and ability to secrete a variety of signaling proteins, these cells play critical roles in host immune responses as well as everyday biological processes



### Jeff Dong

Jeff joined the department in October of 2022. He completed his PhD with Dr. Pauline Johnson in the department Microbiology and Immunology at the University of British Columbia. His research focused on how alveolar macrophages regulate lung health and disease. He then completed postdoctoral training with Dr. Wee Yong at the University of Calgary where he studied new mechanisms of neuroinflammation and neurodegeneration in multiple sclerosis. He is thrilled to be joining BMI and his laboratory will focus on understanding how immune cells and oxidized lipids regulate health and disease in the central nervous system.

### Shannon Durand

Shannon Durand joined the department in January of 2022 as the Department Head Assistant. She previously worked at the College of Law and Central with the University as an event planner. Shannon has a 4-year Psychology B.A. from the University of Saskatchewan.



# DEPARTMENT NEWS

## STAFF HIGHLIGHTS

### Bruna Bonavia-Fisher: Invaluable Facilitator



Last spring the College of Medicine put out a call for nominations for awards to recognize staff members who have gone above and beyond. Bruna's colleagues customized the "Invaluable Facilitator Award" to capture all the support that Bruna brings to the department and her colleagues.

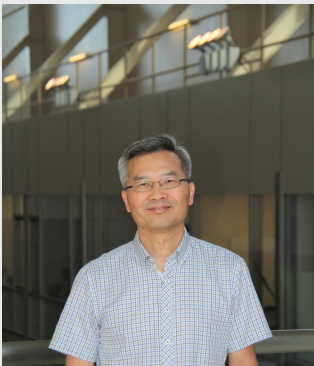
Bruna works with faculty in both Anatomy, Physiology, and Pharmacology, and Biochemistry, Microbiology, and Immunology. She provides support to both departments in applying for

funding, advises on how to write successful grants applications and how to navigate university systems and policies.

Bruna is an invaluable member of our team, and we are thrilled to congratulate her on this well-deserved award. To read more please [visit here](#).

## Years of Service Recognition

Congratulations and thank you to all our team members who reached important milestones in their careers with the University.



Hong Wang  
20 Years



Yu Luo  
20 Years



Stan Moore  
20 Years



Harold Bull  
15 Years



Scot Stone  
15 Years

# IN THE NEWS

## Consultation with NASA



Dr. Troy Harkness was recently mentioned in a CBC article for his consultation on a project with NASA. In 2006 Dr. Harkness visited Loma Linda University and his collaborator Dr. Andy Obenous, and together they worked on a project with the aim of investigating whether or not proton radiation was detrimental to yeast, and if so what pathways

are involved in repairing DNA damage. Protons in space have enough energy to penetrate heavy shielding, as a result protons represent a serious impediment to humans in space. They found that the homologous recombination pathway is required for proton-induced repair and published the results of their work in 2008. A member of the NASA research team, Dr. Greg Nelson, was working at Loma Linda at the time and had attended some of the meetings between Harkness and Obenous. Dr. Nelson eventually shared the results of their work with a team lead by Dr. Sharmila Bhattacharya, that was looking for ways to measure and detect biologically relevant proton radiation damage in space. Dr. Bhattacharya brought Dr. Harkness onto the team as a consultant, and in 2014 the team received \$4M in funding from NASA for a project which was called BioSentinal. The results from this experiment will form the background for bigger experiments where BioSentinal can be used as a monitoring system for humans in space.

To read the full CBC article please [click here](#).



## USask's Revamped Biomedical Sciences Program Proves Popular with Students

The new biomedical sciences (BMSC) degree program at the University of Saskatchewan (USask) is attracting significant attention from prospective students from around the world as evidenced by a significant increase in registrations this fall. This program was made possible through a first-of-its-kind partnership at USask between the Colleges of Medicine and Arts & Science. Read the entire [article here](#).

## Kerry Lavender, University of Saskatchewan research project aims to cure HIV



Dr. Lavender is currently researching the elimination of the HIV virus and her work was recently highlighted in an article by Global News. To read the full article please [click here](#)

## TEACHING EXCELLENCE



**Bill Roesler** received the USSU Open Resources Initiative Award in the spring of 2022. Every year the University of Saskatchewan Students' Union celebrates excellence on our campus through teaching awards and through awards for excellence outside the teaching field. This award is granted on the basis of commitment and dedication to the move away from paid educational resources (Homework systems, textbooks, etc.) to open resources which fulfill the students' educational needs.

*In a gentle way, you can shake the world.*

*Mahatma Gandhi*

# RESEARCH SUCCESS



The NIH, and specifically the National Institute on Aging (NIA), has awarded Pete Pioli with an R03 grant for his research titled: "Development of an Inducible Conditional Gene Deletion Mouse Model to Study Plasma Cell Development and Longevity"

The award is for 2 years with a total USD amount of \$107,516.



Congratulations to **Jessica Sheldon** who was awarded a Saskatchewan Health Research Foundation (SHRF) Establishment Grant for \$120,000.00 over a three-year period.



Congratulations to **Eriq Lukong** and **Taniya Saha** (Intern) for their Mitacs grant for \$180,000.00 over three-years on the research titled "Deciphering the role of oncogenic kinase Lemur tyrosine kinase 3 (LMTK3) in breast cancer stem cell mediated multidrug resistance" in partnership with Temple Therapeutics Inc.



Congratulations to **Anil Kumar** for a very successful year. The CIHR priority announcement grant of \$400,000 was awarded for his research titled “Functional analyses of pathogenicity determinants of SARS-Coronavirus-2 delta variant”. This study examines how genetic changes in SARS-Coronavirus-2 led to the evolution of the delta variant, one of the most virulent variants so far. The project will investigate how the critical mutations that arose in the delta variant altered its interaction with host cells leading to the observed increased in viral pathogenicity. This project is in collaboration with Prof. Tom Hobman at the University of Alberta.

Dr. Kumar also received a NSERC Discovery grant of \$149,500 for his research titled “Discovery and Characterization of Cellular Factors Modulating Type III Interferon Induction and Signaling” which will systematically examine how proteins and pathways in human cells affect the production and signaling of interferon lambda. Interferon lambda plays a vital role in protecting the body against invading pathogens on mucosal surfaces like the respiratory tract and the gastrointestinal tract.

Dr. Kumar also received a SHRF Excellence Award which recognizes the top-ranked application in the Biomedical Establish Grant competition. He was also awarded a MITACS Elevate and a MITACS Accelerate grant of \$120,000 for 2 years.

[Read more here.](#)

Congratulations to **Jenny-Lee Thomassin** on winning the John R. Evans Leaders Fund in the latest CFI competition for her work entitled: "Microfluidics for the Improved Study of One Health Pathogens" for \$130,000.00

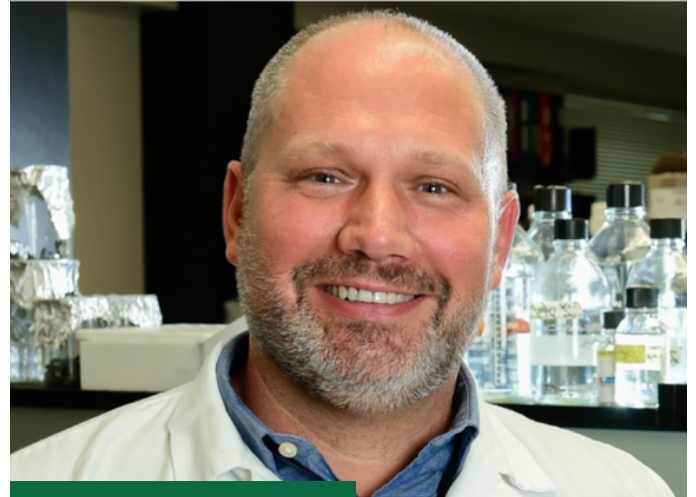
The daily lives of Canadians are impacted by our relationship with bacteria; for example, every year over 50,000 Canadians get sick and 500 will die after eating food or drinking water contaminated with diarrhea-causing *Escherichia coli*. This CFI grant will allow for the purchase of a microfluidics system, custom microscope, and bacterial storage system. This microfluidics system can imitate the different parts of our bodies or surfaces found in hospitals and allow for the in-depth study of how bacteria interact with each other, their environment and infect humans.



Read more about this study [here.](#)



This summer, the Napper lab received funding from two separate agencies to develop vaccines for two different protein-misfolding diseases. The first grant that came from a consortium of the Alberta Conservation Association, as well as the Saskatchewan and Alberta governments, provided a research team that included the Napper lab with \$1.5M to develop oral vaccines for chronic wasting disease, a prion disease of elk and deer. A second grant from the Weston Brain Institute provided Napper and colleagues from across Canada \$1.2M to develop a vaccine for Parkinson's disease.



Scott Napper

To read more please [visit here](#).



Yuliang Wu was awarded the Leukemia & Lymphoma Society of Canada (LLSC) Blood Cancer Research Jump Start Grant for his research titled "DDX41 as a novel therapeutic target in MDS and AML" for a total of \$100,000.00

DDX41 is a new addition to the genetic landscape of inherited hematologic malignancies, especially Myelodysplastic syndromes and acute myeloid leukemia. The goal of this project is to identify novel molecules that selectively kill leukemia cells by targeting DDX41.

To read more please [visit here](#)

Congratulation to **Scott Leary** for his CRS Grant for \$120,000. The grant, which also includes Drs. Andrew Freywald and Franco Vizeacoumar as co-applicants, is focused on breast cancer and the development of novel treatment avenues. More specifically, it proposes to investigate whether impairing the function of a group of proteins that reside on the outer mitochondrial membrane that are important for organelle division in breast cancer tumour initiating cells can be used to kill them and as such cure the malignancy.



Dr. Leary was also successful in receiving a \$50,000 CoBRIDGE for his CIHR PG 2022 Spring application for his research on "Disrupting mitochondrial function in the liver: implications for immune suppression"



Kerry Lavender

Congratulations to **Kerry Lavender** for a very successful year. She received a five-year Project Grant from CIHR for \$879,750.

Her lab has found that the soluble antiviral immune mediator, IFN-alpha14, has an impact on the actions of a specific immune subset called Natural Killer (NK) cells.

Natural killer cells are experts at finding and destroying virally infected cells and IFN-alpha14 appears to supercharge this immune subset to do that job better. Her work aims to understand how IFN-alpha14 specifically impacts the function of NK cells and then use this knowledge to harness these effects and incorporate them into new therapeutic strategies to significantly reduce or even eliminate HIV infected cells from the body.

In addition, she received an NSERC Discovery Grant and NSERC Discovery Launch Supplement. She was also successful in obtaining the Project Grant – Priority Announcement: Pandemic Preparedness and Health Emergencies: Early Career Investigator Prize competition which awarded her \$100,000.00 for her research titled “IFN-alpha subtype specific effects on NK cells during HIV-1 infection”.

## SCIENTIFIC COMMUNITY ENGAGEMENT & PUBLIC SERVICE



**Eriq Lukong**, a faculty member in the department, was recently appointed to the position of Assistant Dean of Graduate Studies in the College of Medicine. He is passionate about providing strong mentorship to graduate students, something that he himself didn't have when he was a graduate student. He will continue to teach in the area of cancer and human metabolism, and to work on his primary research program – breast cancer. Please read more [here](#).

Dr. Lukong is also actively involved in the Canadian Black Scientists Network (CBSN) and currently serves as its vice-president. The CBSN hosted its first Annual Black Excellence in Science, Technology, Engineering, Mathematics, Medicine and Health (BE-STEMM) conference which was sponsored by the USask Office of the President and other major Universities. [Click here](#) to learn more.

# SCIENTIFIC COMMUNITY ENGAGEMENT &

## PUBLIC SERVICE

Continued



Showing the true diversity of scholarship and the women leading the way, ResearchHER offers an A-Z of research and researchers from around the world, exploring who researchers are and what they really do, all whilst celebrating female scholarship. **Jenny-Lee Thomassin** was one of 30 women researchers highlighted in the book. All proceeds of sales from this book will go to supporting out-reach activities. Pre-sales are available on the emerald bookstore website, Amazon and Barnes & Noble. Her publisher's honorarium will be donated to pay for copies of the book to be sent to libraries in Saskatoon public schools. The official publication date is Sept 12, 2022.



**Jo-Anne Dillon** served as Scientific Chair and Fundraising Chair for the 23rd International Union against STIs (IUSTI) World Congress which was held in Victoria Falls Zimbabwe, Sept 4-7, 2022. The website for the conference can be found [here](#).

She is also President-elect for the IUSTI world organization and Immediate Past President of IUSTI-Canada, which she cofounded.



**Peter Bretscher** recently had a letter published which addresses a recent paper in PNAS that argues that increased investment in science leads to increased information, and so to our collective inability to be reflective and think about the big questions. The authors suggest this is an inevitable consequence of the information overload. Dr. Bretscher examined how research grant funding can be changed to foster greater research resilience, and how one can assess whether the proposed changes are effective. [Read more.](#)



**Joyce Wilson** became the co-leader of the CanHepC training program this year. She will be working to help organize seminars, a graduate course, a journal club and manage annual trainee applications and their review by a panel to grant admission of new trainees.

She is also a co-lead of the EDI Committee for the biomedical science departments.

# STUDENT AND TRAINEE SUCCESS

## Departmental Undergraduate Scholarships

### Dr. Louis T.J. Delbaere Memorial Scholarship

Congratulations to **Hannah Braun** for being this year's recipient of the **Louis Delbaere Memorial Scholarship**. This scholarship, which comes with an award of \$2000, is given to a fourth-year student majoring in Biochemistry who has demonstrated the potential and interest to pursue a career in biochemistry.



Hannah Braun



Sara Seifert



Deborah Achoyne

### Dr. Dorothy Kline Memorial Scholarship

Congratulations to **Deborah Achoyne** and **Sara Seifert** for being this year's recipients of the **Dr. Dorothy Kline Memorial Scholarship**. This scholarship is awarded to students majoring in Biochemistry with the highest academic averages in BMSC 200 and BMSC 230, with two \$500 awards given out annually.

## The Biochemistry Scholarships

Congratulations **Meet Patel** and **Haley Paul** for being this year's recipients of the **Biochemistry Scholarships**. This scholarship is awarded to students entering their final year of a B.Sc. 4-year or Honours degree program in Biochemistry. It is based on the overall academic achievement in all 300 and 400 level Biochemistry courses. The recipients of this award each receive \$500 awards.

## Undergraduate Convocation Awards

### Most Outstanding Graduate in Biochemistry

**Haley Paul** was awarded the **Most Outstanding Graduate in Biochemistry** for convocating with the highest academic average of all Biochemistry graduates.



Haley Paul

### J.F. Morgan Memorial Award

**Meet Patel** received the **J.F. Morgan Memorial Award** for the most outstanding graduate in Microbiology & Immunology.



Meet Patel

## Additional Awards

### Kathleen Dorr Memorial Prize in Microbiology, & Immunology

**Meet Patel** was awarded the **Kathleen Dorr Memorial Prize in Microbiology & Immunology**. This \$300 Prize recognizes the student who completes a six credit unit honours research project and who is judged to have the top-ranked Honour's thesis and presentation. Meet carried out a research project that examined a unique mechanism whereby DNA damage can accumulate in *Saccharomyces cerevisiae*.

### Irene Grodums Memorial Graduate Scholarship

**Saurav Rout** recipient of the **Irene Grodums Memorial Graduate Scholarship in Biochemistry, Microbiology & Immunology** for the 2021-2022 academic year. This \$1000 scholarship is awarded annually to a graduate student judged to have the best record of academic excellence and research achievements in our graduate program.



Saurav Rout