GREETINGS

We wish you all a Wonderful Holiday Season and a New Year full of Happiness and Health. Best wishes from Medical Microbiology and Infectious Diseases

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ANNOUNCEMENTS/AWARDS

It is with great pleasure that we announce that Denice Bay has won a 2018 U of M/UMFA Merit award in the “Service” category. In addition to Denice’s never tiring service as chair of the graduate studies program (efforts which have resulted in record levels of MMID student awards this year at Research Days), she also serves as UMFA rep, worked on a committee to help define faculty teaching loads in the Rady Faculty of Health Sciences and is involved in training activities at the RFHS and nationally for the Canadian Society for Microbiology, among many other activities.

Congratulations also goes to Yoav Keynan and his whole team at the National Collaborating Centre for Infectious Diseases (NCCID) on the approval of a 8 year renewal of the program which is valued at > $1M per year and is funded from PHAC. The NCCID performs knowledge translation for infectious disease related issues for public health practitioners and the general public. The NCCID is an important part the infectious disease cluster here at the UM and thanks to Yoav’s leadership the organization is growing and having an important impact on how public health practitioners view infectious diseases and their prevention. Congratulations all.

Faculty of Graduate Studies awards

Starting far left back row going left to right: Kieran Milner (Bay/Sharma lab): University of Manitoba Fellowship, Titus Olukitibi (Yao lab): Research Manitoba Studentship, Faisal Nuhu (McKinnon lab) : Research Manitoba Studentship, Dr. Keith Fowke and Denice Bay, Shifa Mohideen (Fowke lab) : University of Manitoba Fellowship Monika Kowatsch (Fowke lab) : CIHR Doctoral, missing Allison Balasko (Fowke lab): Vanier Scholarship

On behalf of the whole MMID department, I would like to extend congratulations to Dr. Michael Mulvey on being promoted to the rank of Professor. His CV spoke for itself and his contributions to MMID are significant and greatly appreciated. He is a great example of a federal scientist engaging with an academic environment. We are so proud of your accomplishment!

CANADIAN ANTIMICROBIAL RESISTANCE ALLIANCE (CARA)

The Canadian Antimicrobial Resistance Alliance (CARA) in partnership with our colleagues at the National Microbiology lab (NML) published a supplement in the Journal of Antimicrobial Chemotherapy (August 2019) entitled: Ten years of the CANWARD Study (2007–16)

The papers include the following titles:

1. 42936 pathogens from Canadian hospitals: 10 years of results (2007–16) from the CANWARD surveillance study


3. Species distribution and antifungal susceptibility of invasive Candida isolates from Canadian hospitals: results of the CANWARD 2011–16 study

4. Characterization of carbapenem-resistant and XDR Pseudomonas aeruginosa in Canada: results of the CANWARD 2007–16 study

5. Dramatic rise in the proportion of ESBL-producing Escherichia coli and Klebsiella pneumoniae among clinical isolates identified in Canadian hospital laboratories from 2007 to 2016

6. Comparison of antimicrobial resistance patterns in Streptococcus pneumoniae from respiratory and blood cultures in Canadian hospitals from 2007–16

7. Trends in antimicrobial resistance over 10 years among key bacterial pathogens from Canadian hospitals: results of the CANWARD
THE INTERNATIONAL INFECTIOUS DISEASE & GLOBAL HEALTH TRAINING PROGRAM (IID&GHTP) - 2019 UPDATE

By Natasha Hollett, Program Coordinator, IID&GHTP

It has been another successful year for the International Infectious Disease & Global Health Training Program (IID&GHTP). Currently, we have thirty six trainees from four research sites (Medellin, Colombia; Bangalore, India; Nairobi, Kenya; and Winnipeg, Canada).

Since January, we have hosted nine Infectious Minds meetings, connecting the four research sites to discuss a range of topics such as “Inflammation & Male Infertility,” “Climate Change & Infectious Disease Dynamics,” and “Emerging Infectious Disease: Prediction and Management.”

In February, fifteen trainees travelled to Medellin, Colombia for a two week course on “Practical Epidemiology and Field Studies.” The course was organized by the IID&GHTP in partnership with the Universidad de Antioquia, Universidad Pontificia Bolivariana, and Corporación Universitaria Remington and was the tenth major course offered by the IID&GHTP since 2009.

Now that 2019 is almost over we have big plans for 2020. The Infectious Minds session will be continuing with the first session scheduled for January 23rd. Also, from May 19-29 we will be hosting the Ecology of Infectious Diseases (EcoID) course. This course is mainly open to PhD students in the departments of MMID and CHS, but students transitioning to PhD can also participate. If you want to learn more about EcoID please contact the Program Coordinator.

If you are interested in international multidisciplinary health research and becoming a member of the IID&GHTP please visit our website: www.iidandghtp.com or contact the Program Coordinator, Natasha Hollett (natasha.hollett@umanitoba.ca).

Carmine Slipski, a fourth-year PhD student, in the department of medical microbiology and infectious diseases, Max Rady College of Medicine, became interested in microbiology and infectious diseases after seeing the film Outbreak when he was a child.

Carmine Slipski was both terrified and intrigued when he saw the film Outbreak as a child. The 1995 movie about an Ebola-like virus captured his imagination and ignited his interest in infectious diseases. His path was set.

Slipski is now a fourth-year PhD student in the department of medical microbiology and infectious diseases, Max Rady College of Medicine, Rady Faculty of Health Sciences. He is currently researching antimicrobial resistance mechanisms in bacteria like E. coli.

His exposure to the world of microbiology and infectious diseases through popular culture isn’t uncommon for students in the field, said Dr. Keith Fowke, head, medical microbiology/ infectious diseases (MMID). Pop culture has a huge effect, he said.

“Many students will say ‘oh, I read Richard Preston’s The Hot Zone, or I saw a particular movie and it really made me interested in infectious diseases and that’s what I want to do,’” Fowke said. “So having popular culture highlight epidemics has really raised awareness for our students.”

Slipski said he was fascinated by the idea that something you couldn’t see could have a deadly effect. “I think it’s that sort of excitement in the things we fear kind of excite us the most, that’s why Shark Week is so popular,” he said. “It’s the same thing with microorganisms. These things we don’t fully understand, but are also terrifying,

UM TODAY NEWS

POP CULTURE SPARKS STUDENTS INTERESTS IN INFECTIOUS DISEASES

Originally published in UM Today News on August 22, 2019 —
intrigue us.”

Although movies sometimes get the science wrong, Fowke said it’s great that young people are discovering microbiology and infectious diseases through pop culture. He said that students also gravitate towards his department because they see news coverage about disease epidemics that researchers in the department study—from Ebola to HIV to SARS.

There are currently 65 graduate students in the department. Fowke said it’s a popular program, with twice as many students wanting to pursue grad studies in the department than they have spots available.

While it was a movie that was Slipski’s entry point, he said it was the department of medical microbiology and infectious diseases’ reputation that led him to do his master’s and PhD at the University of Manitoba.

“I think it’s a great department because of the resources we have available to use here in the city,” he said. “Having the level four National Microbiology Laboratory and all those things available just makes it a great hub to study and we have the resources to do it.”

With nine full-time faculty members and more than 100 affiliated faculty members, the department focuses on basic medical science, infectious disease clinical research and public health. Within these areas, Fowke said the research focus is on antimicrobial resistance, viral pathogenesis and HIV.

Ongoing research includes work by Dr. Jason Kindrachuk, Canada Research Chair in molecular pathogenesis of emerging and re-emerging viruses and assistant professor, MMID, who is trying to determine how Ebola viruses are transmitted in the semen of infected men even after they’ve recovered from infection.

Another researcher, Dr. Denice Bay, assistant professor, MMID, is studying antimicrobial resistance in bacteria and how they fight off antibiotics.

Fowke is researching the use of anti-inflammatory medications like Aspirin to prevent new HIV infections. His team recently received $2 million in funding from the Canadian Institutes of Health Research (CIHR). Dr. Adam Burgener, associate professor, MMID, also received $2 million from CIHR to investigate how the microbiome in the human body interacts with vaccines and anti-
retroviral drugs against HIV.

Shifa Mohideen, a summer student in Fowke’s lab who is entering the first year of her master’s, was attracted to the department because of its HIV research program.

“You always hear about the U of M within the headlines spearheading HIV research, not just nationally, but globally, and it’s always something I wanted to be a part of because of the great humanitarian aspect that involves HIV research,” she said.

It wasn’t a fictional film or something in traditional media that attracted Mohideen to the field, but rather a documentary she saw on social media. “It’s interesting how much of the information we take in these days within this generation is greatly accessed through social media, and had I not gotten a YouTube recommendation for a documentary when I was just a pre-teen in middle school, I wouldn’t have come across such an amazing movement,” she said.

Now that Slipski is a scientist, he approaches Outbreak from a different perspective than he did when he was a child. When he re-watches the movie, he can pick it apart for its inaccuracies, but he said it’s even more real for him now.

“I now understand the breadth of the risk with these diseases,” he said. “I also understand that even though things like Ebola, which are very scary and have affected many people in recent years, the underlying diseases like influenza still kills half a million people every year, but yet we just think of it as commonplace and the general population doesn’t really fear those types of pathogens, which are much more relevant and dangerous, but yet they fear the ones that have those severe acute consequences.”

Matthew Kruchak

NEW HOPE IN AIDS RESEARCH

Originally published in UM Today News on July 18, 2019 —

For over three decades, HIV has infected an ever-growing number of people, but two newly funded University of Manitoba research projects offer promising hope to change the disease’s course.

The Canadian Institutes of Health Research (CIHR) has provided significant funding to two Rady Faculty of Health Sciences professors: Medical microbiologist Keith Fowke and
his team will receive $2 million dollars over five years to investigate how anti-retroviral and anti-inflammatory medications can prevent new HIV infections; and Obstetrics and Gynecology professor Adam Burgener and his team will receive $2 million dollars over five years to investigate how the microbiome in the human body interacts with vaccines and anti-retroviral drugs against HIV.

“I congratulate Drs. Fowke and Burgener on their success in this competitive funding award,” said Digvir Jayas, vice-president (research and international) and Distinguished Professor at the U of M. “Their teams are made up of national and international experts who I have no doubt will make inroads in their investigations, for the benefit of all.”

On July 17, the Honourable Ginette Petitpas Taylor, Canada’s Minister of Health, announced an investment of more than $32 million in sexually transmitted and blood-borne infections research from the Government of Canada, through the Canadian Institutes of Health Research (CIHR).

The University of Manitoba has long been at the forefront of HIV/AIDS research, running a collaboration with the University of Nairobi since 1980, significantly advancing the world’s understanding of HIV/AIDS with monumental discoveries such as the virus being transmitted through heterosexual partnerships and from mother to child through breast milk; they also discovered a group of sex workers seemingly immune to the virus, to name just three discoveries.

Fowke’s [BSc(Hons)/88, PhD/95] and Burgener’s [BSc (Hons)/99, PhD/05] new projects continue to uphold this established track record.

KEITH FOWKE’S PROJECT: COMBINATION HIV PREVENTION: USING ANTI-RETROVIRAL AND ANTI-INFLAMMATORY MEDICATIONS TO PREVENT NEW HIV INFECTIONS

Co-Principal investigators: Emmanuel Ho (University of Waterloo); Joshua Kimani (Medical Microbiology and Infectious Diseases (MMID – U of M and University of Nairobi)); Lyle Mckinnon (MMID-UM); Thomas Murooka (Department of Immunology-UM); Julie Lajoie (MMID-UM); Julius Oyugi (MMID and University of Nairobi)

Just as cancer therapy attacks with multiple drugs, this team will employ a combination of biomedical approaches that blocks HIV infections in different ways.

Firstly, they will use anti-HIV drugs that work by blocking the ability of the virus to replicate. Secondly, they will block the inflammatory process that brings the cells that HIV primarily infects into the genital tract using anti-inflammatory drugs. Based on research pioneered by their team members, they have shown that inflammation greatly increases the risk of HIV transmission and can actually nullify the effects of anti-HIV drugs to prevent infections. In one of their pilot studies, for instance, they showed that the anti-inflammatory drug aspirin (acetylsalicylic acid, or ASA) reduces the number of HIV target cells in the genital tract by 35 per cent. They will now further investigate this connection.

Working with a cohort of female sex workers in Nairobi, Kenya who are highly exposed to HIV and are using anti-HIV drugs for prevention, the team will place women with high levels of genital inflammation on the anti-inflammatory drug ASA to assess if the number of HIV target cells in the genital tract is reduced. Meanwhile, in the laboratory, they will use mice with a human immune system to determine the mechanism of how ASA affects the migration of HIV target cells and they will perform HIV infection studies to directly test is ASA can reduce HIV infection.

Finally, because taking drugs daily can be challenging for some people, the team will assess in the humanized mouse model, the long-term goal of using an intravaginal ring that would deliver a contraceptive, an anti-HIV drug, and an anti-inflammatory drug. This proposal will determine if their “Combination HIV Prevention” approach is more effective, thereby providing women with more options for protecting themselves.

ADAM BURGENER’S PROJECT: THE MICROBIOME IN HIV PREVENTION

Co-Principal investigators: Carolina Herrera (Imperial College, London); Roger Paredes (Irsi Caixa, Barcelona)

Co-Investigators: Vanessa Poliquin (Obstetrics, Gynecology and Reproductive Sciences, U of M) and Thomas Murooka (Department of Immunology-UM)

The microbiome has been associated with increased risk of HIV acquisition, but this has not been studied
extensively in the context of HIV prevention technologies, such as anti-retroviral based pre-exposure prophylaxis and vaccines. In this study, Burgener and his team will evaluate how differences in the microbiome of genital tract and gut affect host inflammation, the effectiveness of these drugs, and immune responses stimulated by HIV vaccines. These studies may help us to improve these products to make them more effective for HIV prevention.

This project, in collaboration with IrsiCaixa AIDS Research Institute, builds on Burgener’s past work that discovered the effectiveness of an anti-HIV gel known as tenofovir is related to the presence of “healthy” lactobacillus bacteria in vaginal tract, meaning those women who lacked this bacteria gained little or no benefit from the drug.

“This was a striking result, and made us think that there was some interaction between some bacteria and tenofovir,” Burgener, who is also a Research Scientist with the Public Health Agency of Canada, said at the time.

Burgener’s team was the first to show that vaginal bacteria can impact this class of anti-retroviral drugs, and their efficacy can vary more than three-fold depending on what bacteria are dominant in the person.

Research at the University of Manitoba is partially supported by funding from the Government of Canada Research Support Fund.

UM Today Staff

**U OF M RESEARCHERS HEAD TO WEST AFRICA TO STUDY HOW EBOLA AFFECTS REPRODUCTIVE SYSTEM**

Nicholas Frew · CBC

Posted: Oct 22, 2019 5:00 AM CT. Interview can be found here:https://www.cbc.ca/news/canada/manitoba/university-of-manitoba-researchers-ebola-reproductive-system-1.5328917

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Alfa M.J.

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“While we’re seeing positive results through our work, more work needs to be done in order to reach the poorest of the poor and to better empower girls and women.”

Dr. Maryanne Crockett

Dr. Crockett goes on to explain that the health of a woman is directly linked to the health of her children, the family and, in turn, the larger community. “By providing a critical package of intervention to girls from young childhood to pre-pregnancy through motherhood, we can make a huge positive impact on the lives of the entire community.”

The Department of Pediatrics and Child Health has long contributed to the fight against some of the world’s deadly diseases. In particular, Dr. Jim Strong is leading studies that illuminate the pathophysiology of Ebola infection and the impact of intensive care on its severe disease. From another angle, Dr. Guillaume Poliquin is investigating the long term protection conferred by the VSV-Ebola vaccine, initially developed by the Public Health Agency of Canada’s National Microbiology Laboratory. The work can’t happen fast enough as the worst Ebola outbreak in history began in 2013 and in 2019, the World Health Organization declared the recent Ebola outbreak in the Democratic Republic of Congo (DRC) to be a public health emergency of international concern. The Department of Pediatrics and Child Health is committed to fostering new approaches to patient care both locally and globally, and to supporting the import work of our faculty members.
### GRADUATE PROGRAM

<table>
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<tr>
<th>Name</th>
<th>Program</th>
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<td>M. Luo</td>
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<td>Development of a Novel Therapeutic Against Coronaviruses</td>
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<td>J. Kindrachuk</td>
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<td>The Significance of Human Papillomavirus E6 PDZ Binding Motif on the Transformation and Immortalization of Human</td>
<td>Feb-20</td>
<td>A. Severini</td>
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### GRADUATE STUDENTS

Medical Microbiology and Infectious Diseases Student Council has created the MMID Community Outreach Initiative, which will aim to connect students with volunteering opportunities in a wide range of areas including student outreach programs, environmental sustainability, and community support of at-risk populations. Our first project is working with the Environmental and Sustainability office on campus to implement compost disposal in the lunchroom of MMID that will be picked up 2 – 3 times per week by our volunteers and dropped off at a designated location for removal. We hope to expand this program to other floors in our building and work with the Environmental and Sustainability office on future projects. In the new year, we are also looking to connect students with volunteering opportunities at community support organizations that aid at-risk populations. Our members will work together to complete their background checks before applying to the organization of their choosing. We are hoping that by initiating relationships with established organizations, more students will be able to donate their time and make a larger impact on our community. The MMID Outreach Initiative is always looking for new ways to positively impact our community, and if you are in need of volunteers, whether it be on a short-term or long-term basis, we would be happy to connect you with some hardworking MMID students. Please feel free to contact me if you would like further information, or if you have opportunities that would be fitting for our initiative.

By: Shanelle Gingras

Michaela Nickol's MSc defense, Dr. Yoav Keynan, Dr. Michael Drebot, Michaela Nickol, Dr. Jason Kindrachuk and Dr. Adrian West
Are you a graduate student who is interested in an internship abroad?

If so, then take advantage of the Canadian Queen Elizabeth II Diamond Jubilee Scholarship (QES) program. The QES supports Canadian/Permanent Resident graduate students up to $6000 to complete an international internship in a QES eligible country. Also, the QES supports graduate students from QES eligible countries to come to Canada to conduct graduate level studies or research. Students awarded a QES scholarship must participate in an international internship for a minimum of 90 days while participating in leadership and community engagement activities.

The University of Manitoba is a successful recipient of the QES-2017 award for the proposal entitled “Promoting Community-University Partnerships in Global and Indigenous Health” and is accepting applications for awards. At this time, we have 32 outgoing scholarships (Canadians travelling abroad) and 6 incoming scholarships (international students travelling to Canada) available.

**How do I become a QES Scholar?**

- Choose an international mentor and design a project together.
- The project must be in the area of “Promoting Community-University Partnerships in Global and Indigenous Health”
- Complete an application – submit it 4 months prior to the expected travel date
- Spend a minimum of 90 days abroad working on the project and engaging with community
- Gain international experience
- Develop knowledge/skills in leadership and community engagement
- Develop new knowledge/skills specific to the designed project

If interested in the QES program please contact natasha.hollett@umanitoba.ca for more information.

**Please Note:** Applications must be submitted a minimum of 4 months prior to the planned travel date.
MMID END OF YEAR AWARDS

Dr. Ethan Rubinstein Clinical Fellow Research Award - Dr. Thomas Fear

Educator of the Year Award – Dr. Denice Bay

Clinical Educator of the Year Award - Dr. Pierre Plourde

Jim Parker Educator of the Year Award – Dr. John Embil

Graduate Student Publication of the Year Award - Mohammad Kashem

Knowledge into Action Award - Alan McGreevy
Dr. Fred Aoki Career Achievement Award - Dr. Gregory Hammond

LEFT TO RIGHT: JULEE LAJOIE, MARIANA HERRERA, NATASHA HOOLETT AND EMILIE LAJOIE HELGESON

DEPARTMENT OF MEDICAL MICROBIOLOGY & INFECTIOUS DISEASES

OPEN HOUSE

Join us 4-6 pm, Wed January 8, 2020
University of Manitoba, Fort Garry Campus
Rm 201 Armes Bldg. Lecture Hall
FREE food and refreshments provided
Register on or before Jan 4 using the link: https://doodle.com/poll/the nerves6657
http://umanitoba.ca/faculties/health_sciences/medicine/medical_microbiology/

Left to right: Steve Wayne and Keith Fowke

Denise Bay

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