Chair’s Report
Department of Laboratory Medicine & Pathology
Faculty of Medicine & Dentistry
University of Alberta

Letter from the Chair

Dear Friends & Colleagues!

With the vaccine roll-out proceeding there is light at the end of the COVID-19 tunnel. I would like to express my appreciation and thankfulness to all of you for your contributions, commitment, and perseverance over the last 12 months in sustaining the exceptional services to our patients, learners, and funders (mainly the tax payers of Alberta). It has been a tough stretch but we are almost through it!

Besides our significant contributions to developing, validating, expanding, and providing reliable COVID-19 testing (while continuing to deliver our ‘usual’ patient care services), our department did exceptionally well in securing COVID-19 related research funding (and in other areas!) which already translated into the first peer reviewed publications (check out the publication updates in this Chair’s Report) reflecting our leadership in innovative translational and discovery research and highlighting our contributions to advancing the rapidly evolving field of emerging pathogens.

Accordingly, our Spotlight on Research for this issue highlights the work of Dr. Matthew Croxen focused on the genomic epidemiology of SARS COVID-19. The work by Matthew received competitive funding by CIHR, Genome Canada, and provincial funding. The expertise of Matthew's lab is in pathogen genomics, an area in high demand and which is producing significant novel insight of relevance to our discipline.

Again, I would like to recognize the tremendous efforts and the unprecedented resilience by all of you to continue giving your best in research, teaching, and patient care despite the challenges the pandemic poses to us, together with the compounding pressures and stressors resulting from Connect Care launches, budget cuts, and RFPs. Especially, your commitment to provide ongoing support, mentorship, and teaching to our students and learners is crucial. There is increasing evidence emerging that the pandemic will affect our students and learners in terms of their learning experience, wellbeing, and potentially competency progress under the learning condition the pandemic imposes upon us and our programs.

Please mark your calendars for April 23 & 24, 2021 - DRiVE Days is going virtual! Our planning team is working on developing the online meeting platform for holding DRiVE days as an event which can be accessed and participated in remotely. More details will follow over the next couple of weeks. I hope that many of you can join this event!

Stay safe - Stay healthy – Hang in there!

Sincerely,

Dr. Michael Mengel, MD
Professor and Chair
Department of Laboratory Medicine & Pathology, University of Alberta
North Sector Medical Director, Alberta Precision Laboratories (APL)
Spotlight on Research

Dr. Matthew Croxen
Assistant Professor
Division of Diagnostic and Applied Microbiology
Department of Laboratory Medicine & Pathology

I am a microbiologist at the Alberta Precision Laboratories, Public Health Laboratory (ProvLab) and an Assistant Professor in the Department of Laboratory Medicine and Pathology. Additionally, I am member of Women and Children's Health Research Institute (WCHRI) and the Li Ka Shing Applied Virology Institute (LKSAVI). I have a broad interest in infectious disease genomics, particularly antimicrobial resistance, and population dynamics of vaccine preventable diseases.

Carbapenemase-producing organisms (CPO) are bacteria that are resistant to carbapenem antimicrobials, and often many other antimicrobials; this limits the available therapeutic options to treat infections. CPO include a wide range of organisms including *Klebsiella* spp., *Escherichia coli*, *Citrobacter* spp., *Enterobacter* spp., *Acinetobacter* spp., and *Pseudomonas* spp. Complicating the broad diversity of organisms is that the carbapenemase (enzyme that breaks down the carbapenems) are typically found on mobile genetic elements called transposons that can jump throughout a genome. Further, these carbapenemase-containing transposons are often found on another mobile genetic element called plasmids. Many of these plasmids can be shared within and between different genera, so the dissemination of antimicrobial resistance phenotypes be spread broadly within a host, and in the environment. Given the overall complexity, tracking this array of organisms and their plasmids is not trivial. I have been working with Dr. Tanis Dingle (ProvLab/LMP) to use genomics to help in this endeavour.

Other bacterial genomics projects I work on include collaborations with Dr. Greg Tyrrell (ProvLab/LMP) on changing populations of invasive group A streptococci, as well as using genomics to look at virulence factors in group B streptococci. Additionally, ongoing work with Drs. Tyrrell, Richard Long (Dept. of Medicine) and Leyla Asadi (Dept. of Medicine) is using genomics to understand transmission dynamics of *Mycobacterium tuberculosis*.

ProvLab has been working on the genomic epidemiology of SARS-CoV-2 since the beginning. Early in the pandemic, funding from Genome Alberta and co-funded by Alberta Children's Hospital Research Institute (ACHRI) was awarded to Drs. Linda Chui (ProvLab/LMP), Francois Bernier (UCalgary), James Kellner (UCalgary), Amanda Melin (UCalgary), Paul Gordon (The Centre for Health Genomics and Informatics/UCalgary) and myself to look at the early viral genomes in Alberta. This further led to participation in the Canadian COVID Genomics Network (CanCOGeN), which includes genome sequencing efforts of SARS-CoV-2 across public health laboratories across the country. In addition, I have a CIHR and Alberta Innovates grant to look at direct RNA sequencing at the SARS-CoV-2 virus. Current methods require reverse transcription of the viral RNA into DNA, followed by a highly multiplexed, tiled PCR - a lengthy process. We aim to directly sequence the RNA molecules from a single tube reaction that will allow structural and accurate representation of the RNA sequences to recapitulate genomes. It will overcome limitations imposed by reverse transcription and PCR methods. The CIHR/AI work is in partnership with Drs. Gary van Domselaar (University of Manitoba), Paul Gordon, Morag Graham (UManitoba), Byron Berenger (ProvLab/UCalgary), and Nathan Zelyas. Finally, we are working closely with Dr. Lily Pang's (ProvLab/LMP) on looking at the diversity of SARS-CoV-2 viruses in wastewater.
Spotlight on Research (cont’d)

Not to exclude eukaryotic pathogens, I have been working with Drs. Tanis Dingle and Ilan Schwartz (Infectious Diseases, UAH) on looking at the epidemiology of the fungal pathogen *Histoplasma* in Alberta. In addition, the same group including Dr. Winnie Leung (Edmonton Cystic Fibrosis Director) are looking at the diversity of fungal infections in cystic fibrosis patients over time. With Dr. Joel Dacks (Dept. Infectious Disease), we co-supervise PhD Candidate Shweta Pipaliya (Dept. Infectious Diseases) who is using comparative genomics to look at membrane trafficking in the intestinal parasite *Giardia*.

Finally, I am involved in a University Hospital Foundation funded project co-lead by Drs. Carmen Charlton (ProvLab/LMP) and Nathan Zelyas, which aims to look at the use of high throughput sequencing to look for the causative agent in undiagnosed encephalitis and lower respiratory tract infections. Our idea is to use rapid genome sequencing in a metagenomic approach (sequencing all the genomic content of the specimen) to try to detect pathogens that are otherwise undetectable by commonly used assays. Similar ideas have shown to work in the past in a field called clinical metagenomics. We are hoping to leverage new sequencing technology to be able to detect pathogen genomes in near real time.

Beyond acknowledging the funders above, I think it is important to recognize the hard work and dedication of the unnamed scientists and technologists that we at the ProvLab work closely with every day. Particularly during this pandemic, my continued admiration and appreciation for the work that they do makes me proud to work along side them as colleagues.
New Appointments

The Department welcomes:

- **Dr. Rambod Daneshfar** - Clinical Lecturer – Laboratory Scientist, UAH/APL Site
- **Dr. Tatiana Dragan** - Clinical Lecturer – Microbiologist, DL
- **Dr. Ola Ismail** - Clinical Lecturer – Biochemist, DL
- **Dr. Jamil Kanji** - Associate Clinical Professor – Internal Medicine, MIS/UAH
- **Dr. Prenila Naidu** - Assistant Clinical Professor – Medical Microbiologist, UAH/APL Site
- **Ms. Yvonne Rees** - Clinical Lecturer – Laboratory Scientist, UAH/APL Site
- **Dr. Natalia Solomon** - Assistant Clinical Professor – Microbiologist, DL
- **Dr. William Stokes** - Clinical Lecturer – Microbiologist, UAH Site
- **Dr. Graham Tipples** - Clinical Professor – Medical & Scientific Director, APL
- **Dr. Robert Verity** - Assistant Clinical Professor – Med Microbiologist, DL
- **Dr. Qi Yang** - Clinical Lecturer – Pathologist, DL

News from Medical Microbiology Residency Program

CaRMS will be in a virtual format this year and so the Medical Microbiology Residency Program's website has been updated and can be found at [https://www.ualberta.ca/laboratory-medicine-and-pathology/programs/postgraduate-medical-education--residency-programs/medical-microbiology1/index.html](https://www.ualberta.ca/laboratory-medicine-and-pathology/programs/postgraduate-medical-education--residency-programs/medical-microbiology1/index.html)

Dr. Clayton MacDonald has successfully passed his Royal College examination and has started working as Medical Microbiologist in BC

Wake me when it’s spring
We are proud to announce that the following students have completed their programs:

**Evelyn Asiedu** (supervisors, Monika Keelan, Ania Ulrich) completed her PhD program. Evelyn’s thesis is titled *Evaluating the Persistence of Dissolved Heteroatomic Organic Chemicals in Oil Sands Process-Affected Water by Non-Targeted*.

**Jagdeesh Uppal** (supervisor, X. Chris Le) completed his Master’s program. Jagdeesh’s thesis is titled *Characterization of Urinary Arsenic Metabolites for Use as Biomarkers of Susceptibility to Arsenic Toxicity*.

**Angela Ma** (supervisors, Linda Chui, Greg Tyrrell) completed her PhD program. Angela’s thesis is titled *Characterization of Heat Resistant Escherichia coli isolates Associated with Human Infection*.

**Janet Zhou** passed her doctoral candidacy examination.

**New Student**

We welcomed **Sabrina Foerstner** (supervisor, Raymond Lai) to our doctoral program in January.

**Awards**

Congratulations to these students who received awards acknowledging their research/supporting their graduate programs:

- **Yasser Abuetabh** - Alberta Graduate Excellence Scholarship
- **Thomas Corsiatto** - Alberta Graduate Excellence Scholarship, 75th Anniversary Graduate Student Award
- **Delaram Dara** - Alberta Graduate Excellence Scholarship, Bell McLeod Educational Fund Graduate Entrance Scholarship, Faculty of Medicine & Dentistry/Alberta Health Services Graduate Student Recruitment Studentship
- **Teresa Kumblathan** - HE Bell Scholarship, Bell McLeod Educational Fund Graduate Entrance Scholarship
- **Taryn Stokowski** - Alberta Graduate Excellence Scholarship, Bell McLeod Educational Fund Graduate Entrance Scholarship
- **Jing Yang (Peter) Xu** - Alberta Graduate Excellence Scholarship
- **Janet Zhou** - Alberta Graduate Excellence Scholarship, 75th Anniversary Graduate Student Award
## Presentations

### Dr. Jason Acker:
2. “Storage of Leukoreduced Red Cells as a Safe Alternative to Irradiation”, ISBT 2020 Virtual Conference, Dec 14, 2020 • Selected as “The Best of ISBT Posters - Top 12” of 900 posters

### Dr. Ben Adam
Invited Presentations:
1. Canadian Society of Transplantation (CST) Canadian Transplant Fellows Symposium (online broadcast), October 21, 2020: “Pathology Case Studies—Lung”

### Dr. Tanis Dingle:

### Dr. Steven Drews:
5. “An overview of SARS-CoV-2 research at Canadian Blood Services” Evolve Biologics, Mississauga, ON, November 5, 2020

### Dr. Steven Drews (cont’d):
12. “An overview of SARS-CoV-2 research at Canadian Blood Services” Evolve Biologics, Mississauga, ON, November 5, 2020

### Abstracts:

### Dr. Soufiane El Hallani
Dr. X. Chris Le
Invited Presentations:

Dr. Michael Mengel
Invited Lectures:
2. The 4th International Renal Pathology Conference (November 19-21, 2020), Virtual meeting: “Molecular Microscope in Transplantation”
3. Transplant Grand Rounds, Emory University, Atlanta, USA, November 11, 2020. “Chronic renal allograft rejection revisited”
4. Pathology Grand Rounds, Massachusetts General Hospital, Boston, USA December 17, 2020. “Molecular Transplant diagnostics and why it is different from cancer”

Dr. Elona Turley
Abstract:

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Just to make you smile ...

THIS MORNING MY SON SAID, “MY EAR HURTS,” AND I ASKED, “ON THE INSIDE OR OUTSIDE?”

SO HE WALKED OUT THE FRONT DOOR, CAME BACK IN AND SAID, “BOTH.”

MOMENTS LIKE THESE GOT ME WONDERING .......

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A GOOD LAUGH RECHARGES YOUR BATTERY

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### Recent Publications

#### Dr. Jason Acker:
**Peer-reviewed Publications**

#### Dr. Ben Adam:
**Peer-reviewed Papers**

#### Dr. Sumit Das:
**Peer-reviewed Papers**

#### Dr. Tanis Dingle:
**Peer-reviewed Papers**
Recent Publications Cont’d ...

Dr. Steven Drews

Peer-reviewed Publications:

Dr. Soufiane El Hallani:

Dr. x. Chris Le:

Dr. Roger Leng:

Drs. Janet Elliott & Locksley McGann

Peer-reviewed Journal Papers:

Abstracts:
Recent Publications Cont’d ...

Drs. Janet Elliott & Locksley McGann
Abstracts cont’d:

Dr. Michael Mengel
Peer-reviewed Publications:

Grants

Dr. Sumit Das:
1. BC Children’s Hospital Pathology & Lab Medicine Seed Grant
   Funding agency: BC Children’s Hospital / Value: $10000 / Term: 2 years

Dr. Soufiane El Hallani:
1. Principal Investigator: Soufiane El Hallani
   Project: Evaluation and preoperative integration of Next Generation Sequencing in the assessment of pancreaticobiliary cytology specimens for cancer detection and precision diagnostics.
   Funding source: Kaye Competition 2019.
   Amount: $97,000 for 2 years.
2. Co-Principal Investigator: Soufiane El Hallani
   Project: Enhancing the knowledge of DNA damage repair alterations in advanced prostate cancer within in Western Canada: A real world evidence prospectively collected database in streamlined DNA damage repair genetic testing.
   Funding source: AstraZeneca Global Competition 2020.
   Amount: $450,000 for 2 years.
3. Principal Investigator: Soufiane El Hallani
   Project: Customized web-application to automate analysis and database management of molecular pathology testing in a province wide institution.
   Funding source: AstraZeneca Canada 2020. Amount: $10,000 for 1 year.
2021 SAVE THE DATES....

DRIvE
Discovery, Research, Innovation and Education

DRIvE 2021 will be taking place virtually on Friday, April 23 & Saturday, April 24, 2021

Guest Speakers

Dr. John W. Macgregor Memorial Lecturer
Dr. Samuel Sia
Professor
Department of Biomedical Engineering
Columbia University

Dr. RE Bell Memorial Lecture
Dr. Peter Brindley
Professor
Department of Critical Care Medicine
Faculty of Medicine & Dentistry
University of Alberta

The Banff Pathology Course
Banff Centre for Arts and Creativity
September 9-11, 2021