



Laboratory Medicine

Saskatchewan Health Authority

Pathology & Laboratory Medicine

College of Medicine

CLINICAL CARE PUBLIC HEALTH ACADEMICS

# Annual Report

## 2019 / 2020



UNIVERSITY OF SASKATCHEWAN  
College of Medicine  
DEPARTMENT OF PATHOLOGY AND  
LABORATORY MEDICINE  
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Saskatchewan  
Health Authority



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## ABOUT US

*We would like to acknowledge that we are gathering on treaty 2,4,5,6,8, and 10 territory and the Homeland of the Métis. Recognizing this history is important to our future and our efforts to close the gap in health outcomes between Indigenous and non-Indigenous peoples. I pay my respects to the traditional caretakers of this land.*

## Department Vision

We will deliver high quality services that are integrated, accessible and appropriate for all patients in Saskatchewan.

## Department Mission

We work as a respectful, collaborative and committed team which values transparency and inclusion to ensure a patient-centered and sustainable laboratory medicine service.

*Laboratory Medicine is an integrated provincial organization with a membership that includes clinicians (MD and PhD specialists) who are faculty of the College of Medicine and staff of the Saskatchewan Health Authority. Membership also includes medical laboratory technologists (MLTs), medical laboratory assistants (MLAs), combined X-ray/laboratory technologists (CXLTs), scientists, phlebotomists, and staff in LIS and Regulatory Affairs among others.*

*The Department members work collaboratively, in 200 locations across the province and serve three mandates – clinical care, public health and academics. The entire department is dedicated to excellence in patient care as expressed in the Department vision, mission and values, articulated above.*



## Vision

Healthy People, Healthy Saskatchewan.

## Mission

We work together to improve our health and well-being. Every Day. For everyone.

## Values



Safety  
Accountability  
Respect  
Collaboration & Compassion  
Patient & Family Centred Care





## Vision

We are leaders in improving the health and well-being of the people of Saskatchewan and the world.

## Mission

As a socially accountable organization, we improve health through innovative and interdisciplinary research and education, leadership, community engagement, and the development of culturally competent, skilled clinicians and scientists. Collaborative and mutually beneficial partnerships with Indigenous peoples and communities are central to our mission.

## Values & Principles



### *We're committed to:*

- collegiality
- fairness and equitable treatment
- inclusiveness
- integrity, honesty and ethical behaviour
- respect

### *We believe in:*

- academic freedom
- collaboration
- commitment to community
- different ways of knowing, learning and being

- diversity, equality and human dignity
- excellence
- a healthy work and learning environment
- innovation, curiosity and creativity
- openness, transparency and accountability
- reconciliation
- sustainability

# Provincial Executive

## Purpose

The purpose of the Provincial Executive Committee is to deliver a seamless, high quality patient-centred program across the province of Saskatchewan by means of ethical and evidence-based

decision-making from a provincial perspective and implementation of our Provincial Quality Management System (QMS) and its twelve Quality System Essentials to ensure compliance with Accreditation requirements.



## Provincial Executive Committee

Dr. Fergall Magee, Provincial Head, Laboratory Medicine

Lenore Howey, Executive Director

Dr. Ted Alport, Area Department Lead Regina

Dr. Joseph Blondeau, Clinical Lead, Microbiology Dyad

Nicole Cox, Director, Quality & Safety Dyad

Keri Crawford, Director, Regina

Dr. Andrew Lyon, Clinical Lead, Biochemistry Dyad (Dr. Jeff Eichhorst – Retired)

Dr. Viktor Skihar, Area Department Lead, Rural (Dr. Ian Etches – Previous Member)

Dr. Sheila Rutledge Harding, Clinical Lead, Transfusion Medicine Dyad

Brandi Keller, Director, North

Dr. Mary Kinloch, Co-Clinical Lead, Anatomic Pathology Dyad

Tammy Mason, Director, Rural

David McKinnon, Director, Saskatoon

Dr. Jessica Minion, Clinical Lead, Public Health

Dr. Bruce Murray, Area Department Lead, North

Dr. Jill Wooff, Co-Clinical Lead, Anatomic Pathology

Dr. Fang Wu, Clinical Lead, Quality and Safety Dyad

# Department of Pathology & Laboratory Medicine Staffing & Structure



Dr. Fergall Magee  
Provincial Head



Harold Shiffman  
Finance & Administrative Manager



Dr. Tamalina Banerjee  
Resident Program Director

Deb Quirion  
Resident Program Administrator



Loreen Trautmann  
Clerical Support to Provincial  
Head





## MESSAGE FROM THE PROVINCIAL HEAD

It is my pleasure to present the fourth Annual Report of the evolving, integrated provincial Department of Pathology and Laboratory Medicine (University of Saskatchewan and Saskatchewan Health Authority). This is the second report to occur under the auspices of a single health authority and an integrated laboratory system and covers the academic year of 2019-2020. The intent of this report is to review and celebrate the events and activities that have been the focus of our energies for the past twelve months, an eventful period that has included the launch of Competence by Design (CBD) in our General Pathology Residency Program, continued transition in our integration process and the arrival of COVID-19 in Saskatchewan in March 2020.

Change within complex healthcare organizations is not easy, requiring not only capacities for knowledge utilization and change management abilities, but also tenacity and great patience, a necessary quality emphasized in the interviews of Drs. Alport and Murray (see page 47). A crucial event of this year has been the implementation of our Provincial Executive Steering Committee, comprised of extremely able and dedicated individuals asked to deliver effective, evidence-based decision making from *a provincial perspective*. This is an important step, but our structure will continue to evolve as all of our

leaders strive to translate evidence into improved practice. I would like to acknowledge the hard work of all who are committed to the task of answering the call of the Kendel Report.

Our Educational activities (multi-disciplinary and distributed) are ongoing but the major event in this past year has been the implementation of CBD in our residency program. I wish to commend all who have unselfishly contributed to this successful initiative – complicated, of course, by the COVID-19 pandemic.

Research is alive and well in the Department. A list of presentations, publications, awards and grant funding is provided starting on page 91 of this report. I would like to express sincere thanks to Dr. Marek Radomski, Vice Dean of Research, for granting our department funding to enable an intra-departmental competition for small amounts of 'start-up' grant money. A stand-alone Department Research Day was also supported by this bursary. A description of the projects funded is provided later in this report.

At approximately 8 a.m., (Saskatchewan time), New Year's Eve, a Chinese Government website announced the detection of 'pneumonia of unknown cause' in the area surrounding the South China Seafood Wholesale Market' in Wuhan, an industrial city of 11 million, in



the province of Hubei. The outbreak was one of a dozen confirmed by the World Health Organization (WHO) that December, including cases of Ebola in West Africa, measles in the Pacific and dengue fever in Afghanistan. Outside of China, no one paid much attention to the news. Since that time however, this novel coronavirus (subsequently named COVID-19) has spread throughout the world, frozen international travel, almost extinguished economic activity and continues to confine large numbers of humanity to their homes. A description of our departmental response follows in this report, but I would like to acknowledge the tremendous hard work displayed by so many in this department as they responded to the pandemic. In happier times we will celebrate this amazing work.

Given that the current Provincial Head is in the final year of his term, Dean Preston Smith and Dr. Susan Shaw requested an evaluation by departmental members of activities and perceptions of that term - in the form of a 'Self-Study'. This would have been difficult in the best of times but proved an even more arduous task to complete in the time of a pandemic. I wish to express thanks to all who contributed.

Even as Laboratory Medicine continues to respond to the implications of COVID-19, and to evolve as a provincial organization, other initiatives require our attention. These include, but are not limited to, implementation of Liquid Based Cytology (LBC) in Saskatoon and Regina, development of a Chemistry request for purchase (RFP) for Regina, Rural and North, implementation of Next Generation Sequencing (NGS) to meet accreditation standards in the Dr. Marc Baltzan Histocompatibility (HLA) Laboratory, consolidation of provincial Immunodiagnostics, ongoing re-patriation of companion diagnostics and other genomic testing, and expansion of newborn screening, among other projects. Finally, I would like to express sincere thanks to all of our Hospital Foundations (please see also page 122) and to Dr. Viktor Zhrebetskiy and the leadership team of SALM for providing a generous bursary to help publish this report.



Here is to individual and collective success during an upcoming year that promises to be both busy and exciting!

Provincial Head, Pathology & Laboratory Medicine,  
University of Saskatchewan  
Interim Provincial Medical Director of Pathology &  
Laboratory Services, SHA

Fergall Magee, MD, FRCPC, MHSc



Lenore Howey, Executive Director  
Laboratory Medicine



I would summarize the past year with two words – DYNAMIC TEAMWORK. Teamwork is defined as working in unison towards a common vision. The Saskatchewan Health Authority is comprised of multiple teams who are all connected to a common vision.

*"Healthy People, Healthy Saskatchewan".*

Our Provincial Program is a vital component of the Saskatchewan Health Authority with direct connection to our many educational partners, inclusive of the University of Saskatchewan and University of Regina; our strategies need to be aligned through our program visions. We need to be dynamic and continually learn together. The past year has demonstrated the advantage of being a provincial program as the call for COVID testing arrived on our doorstep in January. Our provincial team delivered and exceeded on working dynamically across all our disciplines to support this new test development and delivery. Research teams began to come together to help explore the activities of the virus on human health. Our Laboratory Medicine vision statement could not have been more evident in the focused actions of many over the past 5 months and this focus will carry us forward stronger together.

*"We will deliver high quality services that are integrated, accessible and appropriate for all patients in Saskatchewan"*

A vision is constant but the way we achieve it comes from specific goals which can be dynamic and change as new information is received on a continuum. The value of having one health authority is to bring the best of all areas/ideas together to strengthen the health system as a whole. I see, witness and personally experience learning every day through team interactions; continual improvement over time, drawing on learning within ourselves and our teams have enhanced the service we are providing. This dynamic teamwork is essential within our many laboratory teams as new information is received through research which benefits keeping ahead with diagnostics. I am thankful for the dedication of all our team members and the research which has been taking place every day as we continue to learn about the virus and continue to grow as a provincially focused team.

I would summarize the past year with two words – DYNAMIC TEAMWORK . . .

Often, we become impatient for change but when change is on our doorstep we may not all be ready for it at the same time. Finding a balance for all team members is hard and conversations get tough in some situations. As we focus on the COVID virus there are many competing priorities so it's essential to continually revisit the language of our vision to ensure our goals stay focused and progress forward. Our provincial program team is young and ever learning as we grow. There will always be bumps along the path to improvement our system. Resilience and perseverance keep teams and their members strong through dynamic teamwork.

Stay well, stay healthy and stay connected.

Lenore Howey



The 2019/2020 year saw many strides forward as the Saskatchewan Health Authority and the Laboratory Medicine portfolio strengthened together as a true provincial entity. The divisions of Laboratory Medicine worked together with our Laboratory leaders to develop

strategic objectives and key results to measure our progress forward in building a strong Laboratory service for the province of Saskatchewan. Nothing that we could have planned for or arranged could have galvanized our Provincial Laboratory Medicine portfolio more than the COVID-19 pandemic which impacted us all in March 2020. This historical pandemic has forced our entire SHA and Laboratory Medicine team to collaborate and coordinate with a single new focus. This collaboration and coordination has brought us new innovations, new technologies, and new priorities. We have seen these new technologies deployed and leaders emerge across the province, as we best position our Laboratory Medicine portfolio to meet the demands for testing and clinical services across our province. We are grateful for the dedication and commitment that has been demonstrated by every member of this team. Thank you all for your efforts and expertise in ensuring that we are doing the best for the people we serve.

Although it might seem like we have a single focus as we start the 2020/21 year, we all must recognize that our ongoing commitment to the needs of the entire healthcare in serving the people of Saskatchewan must continue. As such, we will continue to develop strategies for the resumption of full Laboratory Medicine services; while at the same time meet the requirements for COVID testing and system surge capacities. We can only accomplish this if we work together as a strong provincial team.

We have had the opportunity to meet many members of Laboratory Medicine within the province and the entire team has contributed in so many ways. Together we will accomplish so much by focusing on continuous quality and process improvement across all sites and divisions in Laboratory Medicine. We need to harness ideas for improvement from all members of this amazing team. If we are guided by the strength of many, the Laboratory Medicine portfolio will thrive in the years ahead of us.

We look forward to serving alongside of our Laboratory Medicine colleagues, as we settle into our new normal in these COVID times. This is an opportunity for innovation and expansion of our clinical and academic mandates. Let's work together to make this a transformational era in Laboratory Medicine in Saskatchewan.



A handwritten signature in black ink that reads "Corey Miller". The script is fluid and cursive.

Corey Miller  
Vice President – Provincial Programs  
Saskatchewan Health Authority

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## ***The Power of our Provincial Team***

***We work together to improve our health and well-being. Every Day. For Everyone.***

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## EDUCATION

### Undergraduate Medical Education

In the past five years, the Department has expanded its undergraduate medical education (UGME) teaching contributions with an increased number of faculty members and a renewed commitment for Laboratory Medicine to have a greater presence in UGME at the University of Saskatchewan. The Department values UGME teaching and faculty members are encouraged to contribute to these activities. Currently there is no 'standalone' Laboratory Medicine course, but 16 Faculty Members and two residents have provided leadership and contribution to various courses in Years 1-4, both in Saskatoon and Regina (total of 114.48 hours).

Over the past year, work has been going on behind the scenes to implement some changes to the UGME curriculum. We plan to implement a series of lectures in 3<sup>rd</sup> year boot camp (prior to clinical exposure) devoted to specific topics in laboratory medicine closely aligned to clinical presentations that include and overview of Laboratory Medicine, the emerging role of Point of Care Testing and optimal diagnostic tests in the investigation of chest pain, infectious disease and sepsis, transfusion medicine, malignant and benign hematology and solid organ cancer. We hope to provide a more detailed review in the next Annual Report.

### UGME Career Fair

The Department participated in the annual Career Fair for Year 1 Medical students on 26 FEB 2020. Students were able to freely circulate and gather information on their future opportunities. Dr. Fergall Magee, Dr. Marilyn Kinloch, Dr. James MacPherson and Dr. Phillipe Price represented the Department.



Dr. Kinloch, Division Head, AP, Dr. H. Rees and Dr. Phillippe Price, PGY1, address students' interest.

*(Photo credit: Amanda Woroniuk, Communications Coordinator, CoM)*

## UGME Electives

1. Katherina Baranova, UofW, AP, October 21-November 3 (Supervisor: Dr. Banerjee/Dr. DeCoteau)
2. Selina Ji, UofS, AP, October 21-November 1 (Supervisor: Dr. Ganugapati/Dr. Yu)
3. Selina Ji, UofS, Heme, November 18-December 1 (Supervisor: Dr. Jafari/Dr. Taheri)
4. Noman Hassan, UofR, Regina AP, February 10-February 23
5. Daniel Markewich, UofS, AP Gyne, June 22-July 5 (Supervisor: Dr. Kinloch)

### Multidisciplinary and Distributed Education

The department is **committed to** distributed and **multidisciplinary education**. Department faculty contribute to various health science courses including Path 205, 805.3, BIOC 412/812, PHPY 402 and Principles in Biomedical Sciences-MEDC 115.18. Department members have contributed to Mingling Minds for the past three years. (JdC, MU, JFM-2017, 2018 and 2019, respectively). The Department has contributed to the COM Open House Lecture Day for Grade 12 students, for the past three years.



*Health Sciences E-Wing (pictured above), is the multidisciplinary location for the Colleges of Dentistry, Kinesiology, Medicine, Nursing, Pharmacy & Nutrition and the Schools of Public Health and Rehabilitation Science.*

The Department also supports students in Saskatchewan Polytechnic (Medical Laboratory Technologists, Medical Laboratory Assistants, Combined X-Ray/Laboratory Technologists, Cytotechnologists and Phlebotomists) who undergo training in many distributed sites. We have recently inaugurated a multidisciplinary educational facility in Regina, supported by department funds (\$35,246).

The Department also provides practicum rotations for cytogenetic technology students from Michener College, UHN, Toronto and hopes to implement a similar program for students from the Masters Pathology Assistant Program from U of C.

Photo credit:  
Donna Stadnyk  
(Hematology Supervisor MLT  
III)

### **Pasqua Hospital Integrated Training Space**

On 12 JUN 2020, the Hematology Laboratory staff hosted a "Grand Re-opening and Appreciation Event" in this space, to celebrate its' renewed use for distanced education and quality assurance

during the COVID-19 pandemic. The space was renovated by the SHA in order to accommodate the increased enrollment in the MLT program at Saskatchewan Polytechnic, which contributed training equipment to the space. The College of Medicine contributed funding for high quality microscope/camera/viewing screen setup to support the vision of a space which would be '*Interdisciplinary and inclusive to promote distributed education*'. The intent was to include learners from two institutions (SK Polytech and the College of Medicine) and professionals from two or more disciplines in joint teaching and QA sessions. The Regina Area Hematology department sends a huge thank you to everyone who participated in the planning, funding, construction and furnishing of this space, especially Chelsea Wilker (key in the planning and execution of the project) and Dr. Fergall Magee, who obtained funding for the multi-head microscope and associated setup.

The space was dedicated to Dr. Ramachand Devaraj, who practiced laboratory hematology at Regina General Hospital from 1980 – 2018 and was a strong believer in interdisciplinary morphology teaching. His legacy lives on in the superb skills of the current staff.

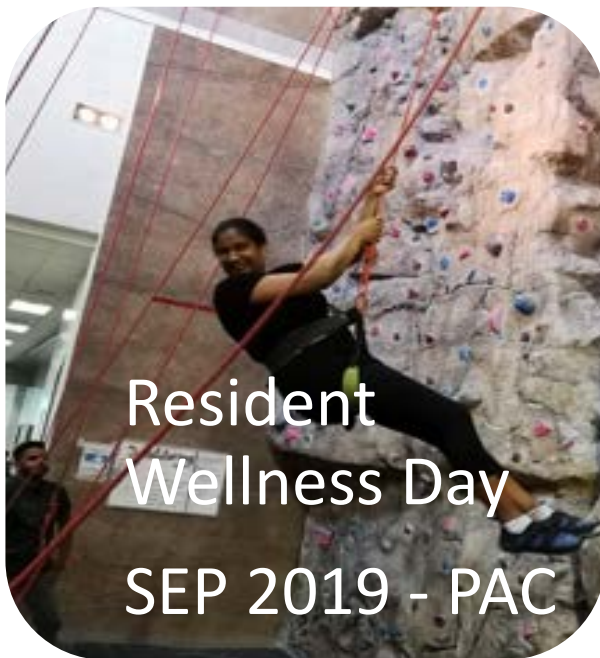




# Residency Program

## Pathology & Lab Medicine Residents 2019 -2020 Academic Year









Residents at the American Society for Clinical Pathology Annual Meeting (ASCP)  
Phoenix AZ SEP 2019  
(Funded through the Department's *Mrs. J. Olszewska Neuropathology Endowment*)

In September of 2019, the Annual Conference of the American Society for Clinical Pathology (ASCP) focused on the practice of Neuropathology. The curriculum included a series of courses devoted to 'A practical approach to neuropathology frozen sections', a 'Review of the 2016 WHO classification of tumors of the Central Nervous System', an 'Update on utilization of molecular diagnostics in neuropathology' and a specific 'Neuropathology Review Course for Residents'. Presentations were delivered by world experts in the field of neuropathology and provided a wonderful opportunity for our residents to improve their diagnostic skills, engage with renowned educators in the field, establish international networks and import new ideas to optimize patient care in Saskatchewan. On behalf of our residents, the Department would like to express its gratitude for the funding provided by the *Mrs. J. Olszewska Neuropathology Endowment*—a fund dedicated to the support of Continuing Medical Education, Scholarship and Research of Neuropathology in the College of Medicine, through the provision of scholarships and bursaries.

# Dr. Glenda Wright, PGY5 Resident

Interviewed by Dr. Archan Kakadekar

PGY2

AUG 2020



## ***Can you walk me through your post graduate journey up until today?***

After finishing medical school, I did a year's rotational internship at the busiest hospital in the southern hemisphere. I then completed a year of community service as an orthopedic medical officer in a rural hospital. I then worked as a family doctor and emergency physician for two years before starting as a registrar in anatomical pathology. I spent four and half years in that position before moving back to Canada. In Canada, I spent a year as a community physician representative on a hospital ethics committee in Ottawa while preparing for the CaRMS match and matched to GP in Saskatoon in the first iteration.

## ***What made you choose General Pathology as a career?***

After having spent more than four years in AP, I really wanted to understand how the rest of the laboratory worked.

## ***If you weren't a pathologist (or any type of doctor!) what other careers would you consider?***

When I applied for medicine, I had two other career choices I also applied for. One was a bachelor degree in music, as I already had a grade 8 and performance licentiate in piano and a grade 4 music theory. The other choice was a polymer scientist.

## ***Is there a skill that you would like to learn? If so, what would it be?***

So many, too many! Surfing! I want to be able to surf properly.

## ***What is your favourite thing to do when you aren't studying/working?***

Runs in the rain, as long as its not a thunderstorm.

## ***What drove you to subspecialise in dermatopathology?***

During my time as a registrar in AP in South Africa I was trained by well-known dermatopathologist who was extremely passionate about his subspecialty and his influence gave me an ongoing interest and understanding in dermatopathology. So, I decided to pursue it!

## ***What was the hardest part of residency in your opinion?***

Coming back after maternity leave, especially learning how to juggle work and being a new mom!

## ***Where was the last place you travelled to for vacation and what was the most memorable part of that trip?***

Last time I travelled was to Ottawa to see family. The most memorable part was introducing Katie to my family; she had so much fun!

## ***Lastly, what to you are important qualities that everyone in medicine (especially those that teach our future doctors) need?***

Compassion, and the ability to collaborate and work efficiently in a team. I believe those skills can be improved in everyone!





## Dr. Phillipe Price, PGY1 Resident

Interviewed by Deb Quirion  
Resident Program Administrator  
SEP 2019

### **What is your favorite ice cream flavour?**

Ever heard of Gold Medal Ribbon? I used to get it at Baskin Robbins. It's basically just chocolate and caramel, with the mere suggestion of ice cream!

### **What are you currently watching on Netflix?**

I'm pretty embarrassed to admit it... but the only thing I can find to watch on Netflix right now is Glee hahahahaha.

### **Who would you swap places with for one day?**

If you can allow me to go to any period, I'm really curious to know what it was like to be Thomas Jefferson. He's said to be the greatest president the States ever had (which I suppose makes him one of the greatest politicians of all time). He was a polymath, which I think is in short supply these days, and I'd love to learn how he put art, science, maths, and politics together.

### **Which three people, alive or dead, would you invite for supper?**

Eric Weinstein, Joe Rogan, and Sam Harris. Weinstein and Harris are, in my opinion, the most brilliant and influential

like to get to know them and get their thoughts on issues that I find interesting. Rogan would be great as well because he has a big heart and an open mind, and I think he would help keep things light and fun.

### **What is the best advice you have ever been given?**

Neil deGrasse Tyson: "Question everything".

### **What is your favorite season?**

Right now it would be winter. I've been living in Ireland for the last 4 years and haven't had a proper winter. It only gets down to about 5 degrees there, so it's just wet and miserable. I'm really looking forward to seeing the snow again.

### **What dessert would you choose?**

I'm a big fan of strawberry rhubarb pie, especially when my Mom makes it from scratch.

### **What super power would you like to have?**

I've always thought if I could be capable of picking up any musical instrument and instantly being a virtuoso; that would be a pretty great super power.

## Dr. Karan Vats, PGY1 Resident

Interviewed by Deb Quirion  
Resident Program Administrator  
JAN 2020



### What would your superhero power be?

Teleportation! Just think of a place & go there in a blink of an eye.

### What is your favorite movie?

Ocean's 11. I'm a big fan of heist movies & in this one, the main characters are so cool and calm under all the pressure. Not to mention the funky background music throughout.

### Where is your ideal vacation spot?

Any place with a beach & mountains. South Africa is very high up on my list right now.

### What are you most thankful for?

Having a supportive group of friends & family. It's nice to have people to lean on at times.

### Which three people would you invite to dinner?

Nelson Mandela (would have amazing stories of how he persevered through extremely tough times & an unfair system with peaceful methods), Roger Federer (explain his dominance in the tennis world for so many years & could give me pointers) & Jerry Seinfeld (bring the laughs).

### What three qualities to you look for in people?

Honesty, modesty and kindness.

### What is your dream vehicle?

A Ferrari 458, in Ferrari red... \*sigh\*...one day.

### What would your last supper be?

Anything with paneer (an Indian cheese & it's delicious!)

### If your life was a movie or book what would the title be?

"Go with the Flow".

### What is the best gift you have ever received?

It is my grandfather's watch that he gave to me before I left for university. He said it brought him luck and he wanted it to do the same for me.

### Is there a skill you wish you had?

I would love to be able to draw. The extent of my artistic skills are limited to drawing stick figures & colouring within the lines.

# General Pathology Residency Program

It is with sadness that I must inform you that Dr. Tama Banerjee has announced her intention of stepping down as Residency Program Director, effective 13 AUG 2020.

I would like to take this opportunity to acknowledge the accomplishments of Tama as she led the program through transitioning to CBD, revamped Transfusion Medicine “call”, implemented a purely digital six-month examination, developed weekly quizzes and a more examination “prep” curriculum, reorganized resident access to grossing, worked with Deb Quirion, Resident Program Administrator, to overhaul resident block rotations into subspecialties and established a regular rotation in Prince Albert.



I wish to commend her effective efforts on behalf of our residents and wish her all success in her future career.

Competence by Design (CBD) was introduced to our Residency Program July 1<sup>st</sup> 2019. CBD is the Royal College of Physicians and Surgeons of Canada's version of an outcomes-based approach to the design, implementation, assessment and evaluation of a medical education program using competencies as the organizing framework. The CBD initiative is part of a worldwide trend in Medical education towards training based on competency as opposed to time. CBD will promote all of the CanMeds competencies and encourage lifelong learning.

The Department of Pathology had been preparing for this significant change for some time by devoting two Department retreats to aspects of this topic, identifying Clinical (Dr. Janine Benoit) and Resident (Dr. Alicia Andrews) Leads for CBD, implementing a Competency Committee on October 24<sup>th</sup>, 2018 (Dr Janine Benoit [Chair], Dr. T Banerjee [Program Director], Drs. R Kanthan, K. Malejczyk and P. Dokouhaki and Mr. Harold Shiffman) and seeking advice and expertise from other Departments who had already introduce CBD (Drs. Brent Thoma and Lyndsey Martin from Emergency Medicine and Dr. Brian Ullmer from Surgery. Residents have been equipped with iPads to facilitate collection of frequent feedback and communication while faculty have been orientated as to their role in this process through a series of one-on-one meetings with Dr. Benoit regarding EPortfolio and discipline specific Entrustable Professional Activities (EPAs). New residents who entered the program in July 2019 (Drs. Price and Vats) were the first to experience Resident Boot Camp - an orientation to the various areas of General Pathology. They were also orientated to concepts of EPAs and their 'Transition to Discipline' phase of their training, while a stepwise process of transitioning residents already in the program to a CBD stream is underway.

I wish to commend the hard and effective work of all Department members involved in the successful implementation of the most significant change to the education of our residents since the introduction of CanMeds teaching. A fuller description of CBD led change to resident curriculum follows in the next section.

### 'Off-Service' Residents

In addition, selected Department members provide off-service rotations for residents in Neurology and Neurosurgery seeking experience in (Neuropathology (Drs. Auer and Zherebitskiy), residents in Dermatology seeking Dermatopathology experience (Dr. Osmond) and residents in Obstetrics and Gynecology seeking gynepathology experience (Dr. Kinloch).



Photo credit: Deb Quirion

Drs. H. Wang, J. MacPherson, A. Andrews, T. Banerjee, A. Kakadekar, D. Li,  
G. Wright, S. Tharmaradinam, J. Suresh



# Postgraduate Medical Education (PGME) – Response to CBD

Competency based medical education aims to ensure that graduate outcomes of postgraduate training programs meet the needs of the patients that graduates will serve. As CBD is being introduced to Residency Programs in Saskatchewan, PGME is introducing new educational initiatives to ensure the success of this major change in how we educate the physicians of the future. At the University of Saskatchewan, Pathology & Laboratory Medicine launched its first cohort in July 2019.

## PGME Education

### Program Directors and Program Administrative Assistants Workshop

With the view to develop leading practices and innovations in all residency processes, professional development workshops are held every year for program directors (PDs) and program administrative assistants (PAAs) on various topics pertinent to their roles. The learning objectives for the spring workshop was developed as one of the steps to enable successful transition from the old to the new accreditation standards.

Objectives of this highly interactive workshop included identification of characteristics unique to PDs, PAAs, residents and PGME in the new standards, gaps and concerns in fulfilling roles, best practices and strategies to enhance autonomy and team support, and metrics for success.

### Resident Boot Camp

To provide effective transition into residency, all applicants matched to RCPSC and CFPC residency training programs at the University of Saskatchewan must attend a PGME Resident boot camp. The program is aimed to bring into focus current topics relevant to safe and good medical practice and assist new residents to consolidate baseline skills relevant to successful residency. Trainees also find

the boot camp a good opportunity to meet, learn, and network with other incoming PGY1 residents. Highlights of the two day 2019 program included a variety of hands- on sessions at the Clinical Learning Resource Centre as well as interactive sessions on topics such as privacy, consent, professional boundaries, time and energy management, incident management, access to information, resiliency, laboratory and radiology basics, and success tips from current residents.

### Chief Resident Workshop

Chief Residents play key roles within their residency-training programs, with responsibilities such as administration, scheduling, developing educational programs, directing clinical services, role modeling, and ensuring resident-faculty communications. Given the variation of the leadership responsibilities in this role, and thus the need for a diverse skill set, the purpose of this half-day workshop is to explore different elements relevant to success in the Chief Resident position. The workshop in the fall of 2019 included interactive sessions on the Resident Doctors of Saskatchewan (RDoS) Collective Agreement and Leadership and Others: Managing time, self and energy.

### Resident Quality Improvement Program

The Resident Quality Improvement Program (RQIP) curriculum was developed to better prepare our

physician trainees to lead, assist with, or support improvement initiatives in the province. The vision is for residents to be able to engage in continuous quality improvement and actively contribute to the culture of patient safety. The RQIP curriculum was developed by a collaborative initiative of the Saskatoon Health Region and the College of Medicine under the Safety Hoshin. The program is aligned with patient safety and quality improvement competencies as outlined in CanMEDS 2015 as well as existing orientation processes within the health authority. The curriculum is delivered across residency programs, with faculty members engaged in facilitation and the Health Quality Council providing support as required.

#### Online Residents as Teachers Orientation Module

Residents at the U of S are expected to teach a variety of people including patients, medical students, clerks and fellow residents. The main goal of the Online Module is to provide a guide to their teaching practice as teaching is a core competency within the CanMEDS Scholar role. It also prepares residents for the 2-day TIPS for Residents workshop that they attend within their first year of training.

#### Teaching Improvement Project Systems (TIPS) Course

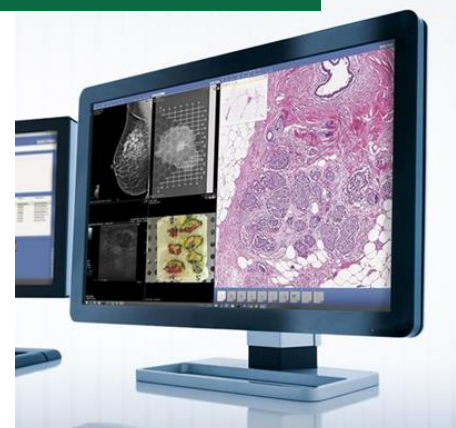
For most physicians, including non-academic physicians, the ability to effectively communicate information in a learning environment is essential. In recognition of the important role that residents play in teaching, and the need for effective teaching skills in practice, the Teaching Improvement Project Systems (TIPS) course provides an opportunity for residents to acquire and strengthen effective teaching skills – it is very interactive with much group discussion and practice teaching.

Research has shown that teaching skills and confidence improve significantly as a result of the course. In 2019, the course was provided to residents across various distributed sites in the province.

#### Critical Appraisal Course

The introductory Critical Appraisal Course for Residents is required to be completed by all residents at the University of Saskatchewan at some time during their residency. This course is part of the overall curriculum in the College of Medicine, which aims to enable residents to access information efficiently, evaluate the quality of the evidence underlying information and then to apply it competently to their clinical practice. The course is provided to residents during Academic Half Days through a combination of interactive, online activities and small-group, in-person discussions facilitated by experts in informatics, epidemiology and statistics, and applied clinical practice.

#### Pathology Viewing amid COVID



## VIEW POINT the Highs and Lows of Medical Education and on being a Medical Educator

So what is medical education and who is a medical educator?

'Medical education is the foundation to training medical doctors at all levels from entry-level continuing on to undergraduate, postgraduate and ongoing medical education in-practice. It is the foundation of our training as physicians and no building can survive without a good foundation' says my junior colleague.

All of us faculty are involved in some form of teaching and /or training of undergraduate (medical student) and or postgraduate (resident) colleagues. So, are we all medical educators? Even being acclaimed as a "great" teacher is not equivalent to being a medical educator because a medical educator needs to understand that *teaching is not the same as learning and learning is not often the same as understanding*. This brings us to the million dollar question: how do we learn or better still how do we learn with understanding? Additionally, in medical education there is an added complexity of teaching a student who begins as a novice but has the end goal of being an expert in a specific discipline. How do you translate theory to practice? The dominant pathway in medicine is as a Clinician -teacher/educator whereby clinical role modelling, learning often occurs by osmosis by watching and

imitating. Other common traditional teaching/learning strategies include lectures, small group discussions, bedside teachings, one-on-one direct supervision with evaluation and feedback on a frequent and real time basis which is an underpinning of the recently adopted competency-based education.

As a medical educator therefore, how do you know if the student is learning or learning with understanding? To explore such aspects you have to delve beyond just teaching - this is the *scholarship of discovery* which may perk your interest into attending /participating in medical education conferences/ attending courses and workshops to discover more/ participate in curriculum changes or revamping a course with alternative teaching / learning strategies such as construction of a learning portfolio / or create a poster for a group project or conduct an in-class debate for and against a controversial treatment/theory or the use of clickers and question poll for immediate just in-time feedback, self-reflection assignments or formalize your interest with a *scholarship of teaching* culminating in a Master's degree or pursue an additional Ph.D.-doctoral thesis.

Many faculty feel that educational roles often have to be juggled with clinical work, thus causing further disruption of the often precarious work-life balance equation. There are perceived challenges and tensions that have to be faced if one wishes to pursue academic education scholarship and this is primarily related to time related dilemmas - fragmentation, lack of recognition, lack

**A medical educator needs to understand that *teaching is not the same as learning and learning is not often the same as understanding*.**

of prioritization, marginalization - competing responsibilities of clinical, teaching and administrative/leadership roles and of thus balancing multiple intersecting identities. Further, predominantly in the past, medical education was often been regarded as work of "lesser value"/low status, in comparison to other health career tracks. This is however changing with cultural organizational shift in priorities and in the present 21<sup>st</sup> climate this fear is no longer valid as this career pathway is now an accepted field of academic enhancement. However, in many institutions the constant dilemma and dichotomy continues to exist between teaching and research - with the eternal question- 'which is a more valuable activity for the faculty? Institutional values and hierarchy of research intensiveness/ output of CHIR/NIH/ NSERC grants versus educational intensiveness of less defined educational grants/projects are slowly but surely

that have to be curated for effective usage in medical education as an example of the *scholarship of application*. As we continue to move away from a teacher-centered platform towards student-centered learning, we, as medical educators have to value all learners and facilitate their learning with understanding in a supportive environment. In pathology, the role of telepathology and learning by creating a multi-hospital video-pathology gross specimen rounds was shared by DMR as "The biggest learning experience from this was that while telepathology has a number of challenges from privacy (requirement of a secure network), inability to have the real life experience etc. it still gave the necessary experience in gross FRCPC, FCAP

Just when we thought we had a few things figured out, along comes COVID which has turned the whole world topsy turvy. You no longer have to be a great

### **What is the role of multi-disciplinary / interprofessional learning experiences and how do we provide this in the post-COVID climate?**

changing across many campuses. Thus, the question remains - is it possible to pursue an identity that works towards the *scholarship of integration* for the three pillars of clinical work buttressed by teaching and research as co-dependent activities leading towards balanced work-life integration.

As health care evolves, so does medical education. As we move beyond the 21<sup>st</sup> century the age of artificial intelligence is here to stay with virtual and augmented reality, gamification and mobile wearable technologies that are all adaptable as tools in medical education. Moving forward, as technology is here to stay; we have to learn new technological skills

teacher as the entire curriculum is going online --we are now forced to acquire new skills, learn new technologies and construct different strategies to create a supportive learning environment for the learner, who now, does not have the physical presence of the teacher. We have new challenges now such as: how to recreate bedside scenarios? What is the role of multi-disciplinary / interprofessional learning experiences and how do we provide this in the post COVID climate? Do we learn procedural skills online / will simulation alone be enough to perform competently in a real live scenario -- is this the way for the future in the post COVID era?? A whole set of new challenges await us. We have to be architects of change in creating



and modifying the learning environment by redesigning and reengineering learning spaces that will optimize learning with curriculum alignment while maintaining regulatory standards with continued ongoing assessments to evaluate the changes implemented.

Though this seems daunting, yet, as always, this too shall pass and we shall overcome.....

As shared by my junior colleague, "the most important lesson I learned from these (amongst other) experiences is there is no right or wrong way to learn or impart medical education.... And there is certainly no one way either... it is a combination, which as we progress towards the virtual era has the capability of becoming more customized to enhance the education of all trainees based on their preferred way of learning".

Till next time. Signing off for now,

We look forward to your unheard views on medical education and /or on being a medical educator.

*Submitted by*  
Dr. Rani Kanthan & Dr. Deepti Ravi



**Dr. Rani Kanthan**  
MBBS, MS, FRCS, FRCPSC, FCAP, M.ED



**Dr. Deepti M. Ravi**  
MBBChBA) (Hons.), FRCPC, FCAP

# Supervision of Trainees

## Dr. Harry Deneer

Blondeau, Leah, Use of novel technologies to characterize bacterial pathogens transmitted from animals to humans, PhD student, 2018 – continuing

## Dr. Pouneh Dokouhaki

Karki, Eva, Identifying patterns of local lab test utilization and implementation of choosing wisely Canada recommendation for laboratory test, May-Jul 2020, Dean's project award. Drs P. Dokouhaki and F. Wu

## Dr. Andrew Freywald

### Post-doctoral fellows

- Dr. Renuka Dahiya, "Development of new effective combination therapy for triple-negative breast cancer", November 2018 – in progress.
- Dr. Tetiana Katrii, "The role of mitochondrial fission in triple-negative breast cancer tumor-initiating cells", November 2018 – in progress.

### Ph.D. students

- Frederick Vizeacoumar, "Mapping the interactome of the Eph family of receptors in cancer", January 2020 – in progress.

### M.Sc. students

Ginton Hanover, "Functional Crosstalk Between the EphB6 receptor and the EGFR receptor", September 01, 2018 – in progress.

Raveena Nair, "Analysis of the crosstalk between the EphB6 and ErbB2 receptors", May 2018 – in progress.

### Honors students

Erin White, "Implementation of Synthetic Lethal Interactions towards the Development of Novel Cancer Treatments", September 2019 – March 2020.

- Teagan Borbandy, "The role of DRP1 receptors in triple-negative breast cancer tumor-initiating cells", September 2019 – March 2020.

- Hassan Yassin, "Developing Inhibitors of the EphA2 Receptor Tyrosine Kinase for Targeted Therapy of Breast Cancer", September 2019 – March 2020.

### Summer students

Erin White, "Targeted Combination Therapy for Triple-Negative Breast Cancer", May 2019 – July 2019.

Vivian Heinrichs, "The role of mitochondrial fission in the propagation and maintenance of tumour-initiating cells", May 2019 – July 2019.

### Dr. Kathy Jafari

Ji, Selina, Elective hematopathology rotation, Medical student, Nov. 18-22, 2019, supervised by Kathy Jafari

### Dr. Jay Kalra

#### Undergraduate Student Supervision

Daniel Markewich, College of Medicine 3rd year, "Quality Management and Assessment of Discordance between Autopsy and Clinical Diagnosis", 2019-20 (34 hours)

Patrick Seitzinger, UBC College of Medicine 3rd year, "The Value of Autopsy in Healthcare", 2019-20 (28 hours)

Avani Saxena, Arts and Science 3rd year, "A Quality Perspective in Medical Error Disclosure", 2019-20 (22 hours)

Zoher Rafid-Hamed, Arts and Science 5th year, "Medical Error Disclosure – An Ethical Dilemma", 2019-20 (32 hours)

Daniel Hooshmand, Arts and Science 4th year "Ethnic minorities' experiences with health care professionals while living with and managing diabetes", 2019-20 (8 hours)

#### Graduate Student Supervision

Ashish Kopargaonkar, Master's Thesis, College of Pharmacy and Nutrition, (Co-Supervisor), Thesis Topic- "Effect of Clinical Pathways on Interprofessional Collaboration and Patient Care: A Systematic Review" 2019-20 – (In Progress)

Hanan Babekar, Ph.D. Student, Committee Chair, Health Sciences Graduate program, "Development of small protein domain affinity reagents targeting biomarker, MUC16/CA125, 2019-20 – (In Progress)

### Dr. Rani Kanthan

#### Supervision of Post Graduate Residents in Pathology

- i) As Visiting Professor – Department of Pathology, Sri Ramachandra Medical College & Research Institute, Chennai, India
- ii) As Visiting Professor-Department of Pathology, Saveetha Medical College and Hospital, Chennai, India

iii) As Tenured Professor, Faculty member -Dept. of Pathology and Laboratory Medicine, University of Saskatchewan, Royal University Hospital, Saskatoon

Andrews, Alicia, General Pathology Resident - *Referred Oral presentation/publication as conference proceedings #5*

Tharmaradhinam, Suresh, General Pathology Resident - *research projects Paper in referred journal listed as publication #3*

Wang, Hui, General Pathology Resident - *research projects Paper in referred journal listed as publication #4*

Supervision of junior colleague for a major review article - Dr. Richa Chibbar  
*Paper in referred journal listed as publication #5*

### Dr. Marilyn Kinloch

Leakos, Sebastian, Biting Off More than Expected: Diagnosis of Unsuspected Malignancy on Hysteroscopic Intrauterine Morcellation, Dean's Summer Student. May- August 2019

Bell, Cassidy, A Patient's Best Chance: Statistical Modelling of Advanced Lung Adenocarcinoma, Dean's Summer Student. May-August 2019

Eckel, Haley, The Effect Access to a Tertiary Care Centre has on Cervical Biopsy - Excision Turnaround time, Dean's Summer Student. May - August 2020

Markewich, Daniel, Discordance between MMR IHC and Sequencing: A Guideline to Resolution for Pathologists, Medical Student Project, Endowment Funding

Dr. Marilyn Kinloch at the International Association of  
Pathology Education Committee Board Meeting at USCAP  
MAR 2020





## Dr. Andrew Lyon

### Graduate Students

Vuong, Stephanie. MSc program. Development of Liquid Chromatography-Tandem Mass Spectrometry Methods of Cannabinoids for Pediatric Patient Samples. Sept 2018-Present. Supervised by Dr. Jane Alcorn and Dr. Andrew Lyon.

Leis, Benjamin. MSc program. Focused Transthoracic Echocardiography in Stroke: a Feasibility Study. Sept 2019-Present. Supervised by Dr. Andrew Lyon and Dr. J. Akhtar.

## Dr. Erick McNair

### Graduate Thesis Supervised

Bezaire, Jennifer, Neutrophil gelatinase lipocalin an early biomarker of acute kidney injury following cardiopulmonary bypass supported cardiac surgery, July 1, 2019-June 30, 2020, graduate student supervision by Dr. E McNair.

### Undergraduate Students Supervised

Magnay, Carla, Association of matrix metalloproteins with acute kidney injury following CPB-supported cardiac surgery. January 15, 2020-March 26, 2020,

Conacher, Josie, Biomarkers of acute kidney injury following CPB-supported Cardiac Surgery. October 8, 2019-March 26, 2020, undergraduate student supervision by Dr. E. McNair.

## Dr. Ahmed Mostafa

Kelly, Erin, Introducing the basics of Histocompatibility Laboratory Techniques, 2020, U of C, Solid Organ Transplant Elective

## Dr. Rajendra K. Sharma

### Graduate Students Supervised

Mr. Praveen Kumar Roayapalley, PhD Student (2014-present)

Supervisor – Dr. J. Dimmock & Dr. R.K. Sharma

College of Pharmacy and Nutrition

Thesis Title: "Syntheses of novel candidate tumor – selective anticancer agents".

Ms. Sukanya Pati, MSc Student (2019-present)

Supervisor – Dr. R.K. Sharma & Dr. J. Dimmock

College of Pharmacy and Nutrition

Thesis Title: "Evaluation of potent cytotoxic curcumin analogs as potent methionine aminopeptidase 2 inhibitors for treating colon cancers."

### Dr. Maruti Uppalapati

Hassan, Yassin, Developing Inhibitors of the EphA2 Receptor Tyrosine Kinase for Targeted Therapy of Breast Cancer, Bachelors Honours Thesis, Sep 2019 - Apr 2020, Co-supervised by Dr. Maruti Uppalapati and Dr. Andrew Freywald

Broqueza, Jaline, Developing radioimmunotherapy for osteosarcoma using comparative oncology, Master's Thesis, Oct. 2019 – present, Co-supervised by Dr. Ekaterina Dadachova and Dr. Maruti Uppalapati

Prabhakaran, Chandrabose, Comparative oncology approach for radioimmunotherapy of osteosarcoma, Doctorate, Jan 2020 – present, Co-supervised by Dr. Maruti Uppalapati and Dr. Ekaterina Dadachova

Babeker, Hanan, Development of small protein domain affinity reagents targeting ovarian cancer biomarker, Doctorate, MUC16/CA125, Sep 2017 – present, Co-supervised by Dr. Maruti Uppalapati and Dr. Humphrey Fonge

## Advisory Committee Membership

### Dr. Fergall Magee

Advisory Committee Co-Chair:

King, Dorothy, PhD Program. Early childhood intervention as a mechanism of building lifelong health resiliency. Department of Pediatrics, Dalhousie University, 2018-present

Advisory Committee Chair:

Bezaire, Jennifer, Masers Committee, Neutrophil Gelatinase-Associated Lipocalin (NGAL) as a predictor of acute kidney injury In Patients Undergoing cardiopulmonary bypass assisted cardiac surgery

### Dr. Harry Deneer

Advisory Committee Member:

Amal Alsaed, PhD Program. Novel in vitro measurement of vancomycin and other antibiotics susceptibility against strains of methicillin resistant Staphylococcus aureus 2019 (begun in 2014)

### Dr. Andrew Freywald

Advisory Committee member:

- Jessica Sharpe, M.Sc. program. "EphB receptors expression and function in canine and human osteosarcoma", College of Veterinary Medicine, U of S, 2020-present.

- Gabrielle Mercier, M.Sc. program. "Understanding the Role of the Anaphase Promoting Complex in Breast Cancer Progression" College of Medicine, U of S, 2020-present.

- Sharmin Sumi, M.Sc. Program. "Checking of PIK3CD as a Cancer Drug Target", College of Pharmacy and Nutrition, U of S, 2016-2018.
- Hussain Elhasasna, M.Sc. program. "Drug re-purposing to eradicate prostate cancer". College of Medicine, U of S, 2018-present
- Hanan Babeker, Ph.D. program. "Development of small protein domain affinity reagents targeting cancer biomarkers MUC16 and MUC4". College of Medicine, U of S, 2017-present
- Omar Abuhussein, Ph.D. program. "Targeting Telomerase overexpression by synthetic dosage lethality". College of Pharmacy and Nutrition, U of S, 2016-present.
- Aditya Mandipati, Ph. D. program. "The Role and Mechanism of Action of BRK in Tamoxifen Resistant Breast Cancer". College of Medicine, U of S, 2017-present
- Chelsea Cunningham, Ph. D. program. "Exploiting the synthetic dosage lethal interactions of Polo-like Kinase 1 for triple negative breast cancer therapeutics". College of Medicine, University of Saskatchewan, 2016-2020.
- Franklyn De Silva, Ph.D. program. "Tyrosine kinase inhibitor, Ibrutinib, discovery and targeting of multiple pathways within primary and metastatic breast cancer". College of Pharmacy and Nutrition, University of Saskatchewan, 2016-present.

### Dr. Rani Kanthan

Advisory Committee member:

Ms. Leah Blondeau, Department of Pathology and Laboratory Medicine, College of Medicine. Supervisors Dr Harry Deneer, Joe Rubin, Sanche and myself: One Health - Role of organisms as pathogens from animals to humans. My role-Member of the Advisory Committee 2018-present

### Dr. Andrew Lyon

Graduate Studies-Committees.

PhD Oral Defense- Chair- Dr. Andrew Lyon. Nazanin Samadi, Dept Physics and Engineering Physics. Oct 22, 2019

### Dr. Maruti Uppalapati

Research Advisory Committee Member

Karkare, Sharayu, Targeted therapy of osteosarcoma with radiolabeled monoclonal antibody to an insulin-like growth factor-2 receptor (IGF2R), College of Pharmacy and Nutrition, University of Saskatchewan, Oct. 2017 - Aug. 2019

Research Advisory Committee Member

Cunningham, Chelsea, Synthetic Dosage Lethal Interactions of Polo-like Kinase 1 and their application in cancer therapeutics, Health Sciences Graduate Program, University of Saskatchewan, Aug 2015 - Mar. 2020

Research Advisory Committee, Chair

Cornea, Stefany, The role of BRK in gastric cancer, Health Sciences Graduate Program, University of Saskatchewan, Jul. 2019 – present

# Grand Rounds

## PATHOLOGY AND LABORATORY MEDICINE GRAND ROUNDS (PALMGRs)

PaLMGRs are established and ran by the Department of Pathology and Laboratory Medicine (DPLM), University of Saskatoon (U of S) for dissemination of basic medical and clinical knowledge in pathology and laboratory medicine as well as in related basic medical and clinical disciplines.

### OBJECTIVES

1. To promote DPLM faculty research and clinical activities including administrative, QA/QC and outreach pursuits.
2. To support collaboration with other departments, centers and laboratories allowing their representatives to present at PaLMGRs.
3. To give pathology residents an opportunity to present their research and clinical projects allowing them to develop better presentation skills.
4. To promote collaboration with pathology and laboratory medicine departments from other Canadian and non-Canadian universities through invitation of their faculty members and residents as visiting speakers.

### PALMGR COMMITTEE

The Committee was established in 2015 by Dr. Fergall Magee (current Provincial Head of Laboratory Medicine with SHA and Head of Pathology and Laboratory Medicine Department with U of S) with the purpose of planning and allowing equal opportunities to present for all areas of basic medical and clinical pathology and laboratory medicine. **Dr. Fergall Magee** is a chair of the Committee. There are three representatives in the Committee: one from basic medical research area (currently **Dr. Maruti Uppalapati**), one from clinical area (currently **Dr. Viktor Zhrebitskiy**) and one from pathology residency (currently **Dr. Jana Suresh**).

### HISTORY AND RECENT DEVELOPMENTS

PaLMGRs were established in 1970's but their attendance was optional and their regularity was often an issue. Besides, they were available only for specialists practicing in Saskatoon. Starting from 2015, the rounds became a part of regular departmental life. They are held on a monthly basis, with summer and winter breaks. In 2019, they were moved to U of S/ Health Sciences building with the opportunity to translate their content through WebEx to Regina and other places across the province. U of S also provides videotaping option allowing faculty members and residents who were not able to attend the round, to review its content in later time.

### LIST OF PALMGR PRESENTATIONS (LATE 2019 - BEGINNING 2020)

1. **Dr. Marilyn Kinloch** (DPLM faculty) "ProMisE that molecular classification in endometrial carcinoma makes to patient care" (September 23, 2019) – update on latest developments in implementation of Proactive Molecular Risk Classifier for Endometrial Cancer (ProMisE) in the area of gynecologic pathology.
2. **Dr. Janine Benoit** (DPLM faculty) "Competence by design: an update" (October 28, 2019) – overview of implementation RCPSC CBD model in departmental teaching of pathology residents.



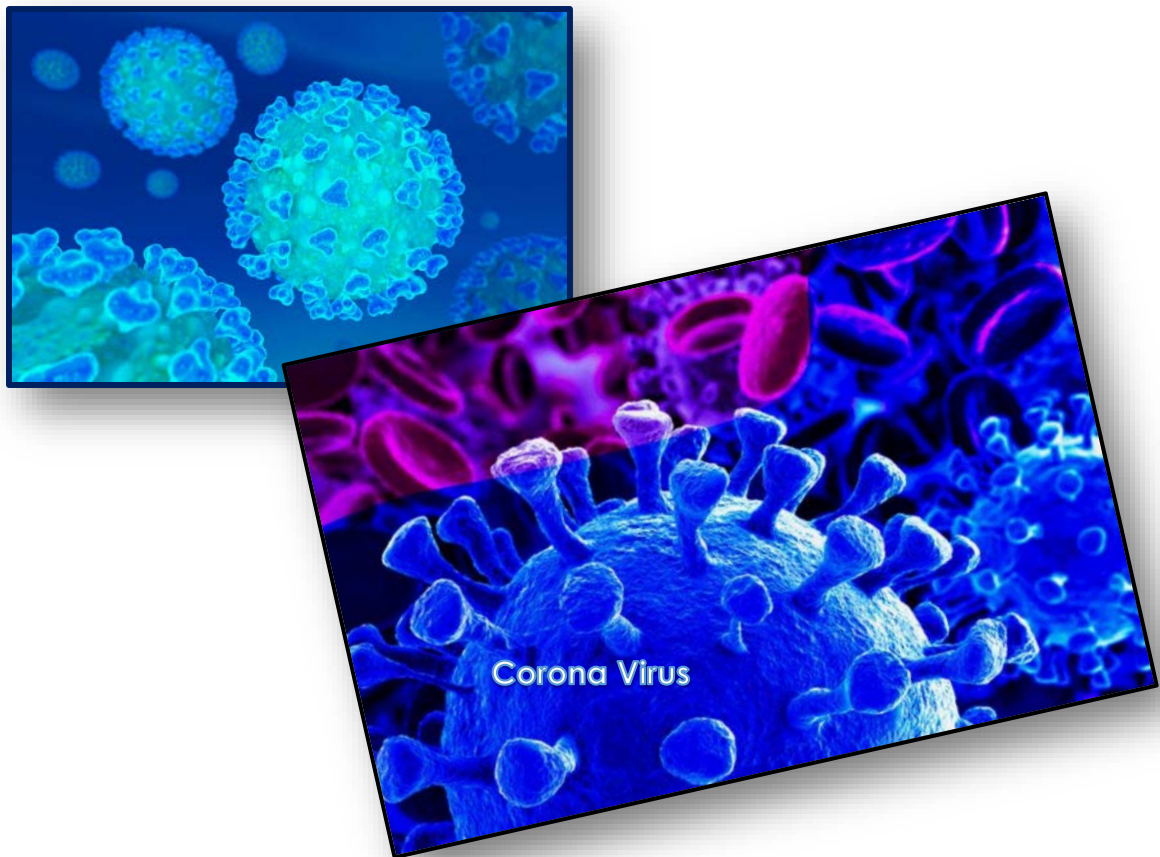
3. **Dr. Alicia Andrews** (DPLM pathology resident) “A primer on anatomic pathology specimens from transgender patients” (November 25, 2019) – overview of approaches and pitfalls while dealing with the specimens from the transgender population.

4. **Dr. Viktor Zhrebetskiy** (DPLM faculty) “Modern multidisciplinary approach to CNS tumors – what is expected from pathologists?” (January 27, 2020) – talk about latest developments in the area of neuro-oncology discussed during SNO-2019 meeting and pathology response on new challenges and technical achievements including molecular genetic testing of CNS tumors relevant for targeted therapies.

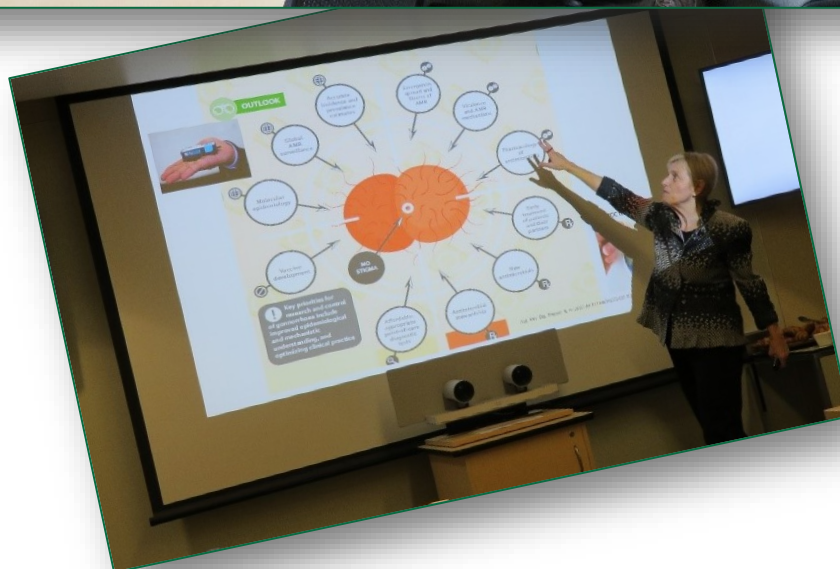
5. **Dr. Jo-Anne Dillon** (Department of Biochemistry, Microbiology and Immunology, U of S) “Predicting antimicrobial resistance & transmission in bacterial pathogens through molecular approaches: *Neisseria Gonorrhoeae*” (February 24, 2020) – lecture on the latest developments in the area of antimicrobial resistance with regards to *N. Gonorrhoea* species including genetic basis of the resistance.

#### COVID19 PANDEMIC

Pandemic spread of COVID-19 put on hold several presentations planned for spring 2020. The resumption of rounds is expected in September 2020.



## PaLM Grand Rounds





## PEOPLE

### Departures

Judy Archer retired after 33 years with SHA (19 of those years as Director, Saskatoon Laboratories), 31 AUG 2019

*Ms. Judy Archer retired in August of 2019. The photos which follow are from a Departmental celebration for Judy at the University Club, on 04 SEP 2019 as we honoured her 33 years of dedicated service.*

Judy grew up on a mixed farm near LeRoy, SK, the 8 of 11 children. She followed her big sister, Goldie, somewhat reluctantly into Laboratory Medicine – as she liked the outdoors and did not think that she would thrive in a hospital environment. However, she found the hospital laboratory to be an inspiring environment that allowed her to learn, teach, experiment, meet interesting colleagues and serve people at their most vulnerable. She felt privileged to witness and be part of so many advances in laboratory sciences. She does not want to date herself, but she has performed “tube tilt” coagulation testing, has used a manual timer for enzyme testing in a water bath – in times when the electronic cross-match could not be imagined, and Anatomic Pathology and Microbiology were completely

manual practices. Although most of her career was spent in publicly funded hospital laboratories, she did spend eight years working in Medical Arts and learned a lot about the private laboratory business.

Her advice to students looking at laboratory medicine as a career – “It is an awesome choice for those who love science and math. The environment is fast-paced and will challenge you if you let it! You will experience change constantly and have opportunities to really make a difference by engaging in the evolution of technology.”

The best part of her career – “working with so many bright and dedicated people as it takes a strong team – hats off to all!”



Judy was the ultimate advocate for patient care, a meticulous planner and the consummate organized leader. Judy will be missed by all of us

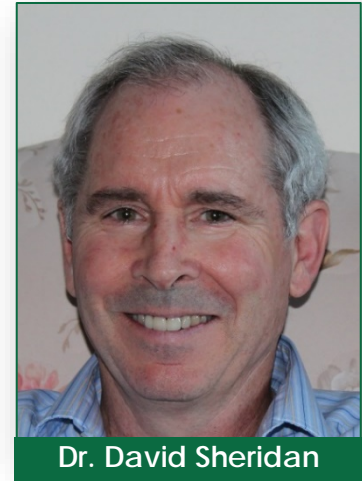
who had the privilege to work with her, but we all wish her success, health and happiness as she embarks on a new stage of her life.

*By Dr. Fergall Magee, Provincial Head*





**Dr. David Sheridan**, Saskatchewan born and bred, left the province only long enough to complete a residency and research fellowship in Hematology. He returned to Saskatoon in 1984 with appointments in both Internal Medicine and Pathology, practicing full-spectrum hematology at the bedside and in the laboratory. Through the years, Dr. Sheridan has provided significant leadership locally, provincially and nationally, striving to ensure high quality care for all. He has been a well-regarded clinician, an effective researcher, and a highly respected teacher of students, residents, colleagues and staff. He has worked hard and effectively to grow the discipline of Hematology in Saskatchewan, in large part by encouraging, mentoring and supporting medical residents to pursue Hematology, and then working hard to recruit them "home" again. For decades, Dr. Sheridan has been the backbone of Transfusion Medicine (TM) in Saskatoon and beyond. He was providing valuable educational and consultative TM support throughout the province long before it was mandated by health authorities, because it was simply the right thing to do. His current TM colleagues and TM laboratory staff have appreciated his ongoing good work and generous willingness to step in when needed. We are building on a strong foundation, thanks to Dr. Sheridan. We wish him, his wife Lynn, and his family all the best in the seasons to come.



**Dr. Bahera Mali** is about to step down from her position as Medical Biochemist in Regina General Hospital. She obtained her medical school training from Dow College, Karachi University (Pakistan) and began her residency training at St. Helier Hospital, Carshalton, Surrey (UK), with the intent of specializing in hematopathology, but after rotating through Medical Biochemistry decided to change to Chemical Pathology. She continued her training in Manchester and London, with a short period in Brighton (General and Renal Medicine), moving to a position (Medical Biochemistry) in Regina in 1990. Her career experience to-date has involved integration and consolidation of separate technologist teams, institutional closure (Plains Health Centre), and implementation of multiple innovative laboratory technologies. More recently, she has been involved in an RFP for the chemistry

laboratories in Regina, while maintaining a keen interest in endocrinology. On behalf of the entire Department, we express our sincere appreciation of her many years of hard work and dedication to patient care. We wish you good health, good luck and great success in your retirement, Dr. Mali!

Dr. D. Sheridan – submitted by Dr. S. Rutledge Harding  
 Dr. B. Mali – submitted by Dr. F. Magee



## Dr. Jeff Eichhorst

Submitted by Dr. N. Antonishyn

### Sincerest Thank You & Best Wishes

After 37 years of service to the Ministry of Health and Saskatchewan Health Authority, Dr. Jeff Eichhorst is retiring on March 31, 2020. His contributions to Laboratory Medicine are many, which is emblematic of his commitment to excellence in patient care.

Dr. Eichhorst was instrumental in developing and implementing the expanded Saskatchewan Newborn Screening program, which was the first in Canada to screen for over 30 rare disorders in addition to PKU and congenital hypothyroidism - including Cystic Fibrosis and Congenital adrenal hyperplasia. While leading Chemistry, Toxicology and Newborn Screening as manager, he completed his PhD (Pathology & Lab Medicine) in 2013. His thesis explored the biochemical differences between high and low dose methadone clients on stable maintenance therapy. Through this work, he developed a comprehensive and specific Tandem Mass Spec screen for over 40 drugs and metabolites in urine; which was a significant improvement for patients and clinicians in treatment of drug dependency. Tandem Mass Spec provided much better sensitivity and specificity to traditional immunoassay testing, as well as significant cost savings.

Dr. Eichhorst provided his expertise and knowledge to both help design the infrastructure for the new RRPL building (2010) and to select and implement the new high-throughput chemistry automation system. He was also very influential in the recent signing of the formal agreement between the SCS and SHA to retain and expand the forensic toxicology testing program at RRPL. Presently, Jeff is working hard on completing an RFP which will see the implementation of a new high-volume automation Chemistry system installed at RRPL, with integration of this system to the Regina General and Pasqua Hospitals.

A few sentences for any long-time lab employee will never be sufficient to thank them for their continued dedication and all the professional accomplishments they have achieved, but it is also very difficult to put into words the appreciation we have for Jeff as a person, a trusted and invaluable colleague, and a mentor!

The Department will miss you dearly, but congratulations on a well-deserved retirement.

Wishing you a healthy, long and happy retirement with your family!

## Dr. Al-Nourhji

Submitted by Dr. M. Kinloch



Dr. Al-Nourhji has moved to Ottawa to join the pathology group at EORLA but we still miss him. Omar provides cytopathology expertise and a member of the Gyne group beloved by all who worked with him. In fact, it was many months before a tumour board would go by without one of the Gyne surgeons lamenting about how much we miss him. He and his family are thriving in Ottawa and we wish them the best!



Dr. Al-Nourhji's Last Day with us at SCH





*The Transfusion Medicine Lab welcomes Paula Lehto (left) as the new Tech Supervisor, replacing Karen Hindmarsh (right) who retired on 10 JUL 2020.*

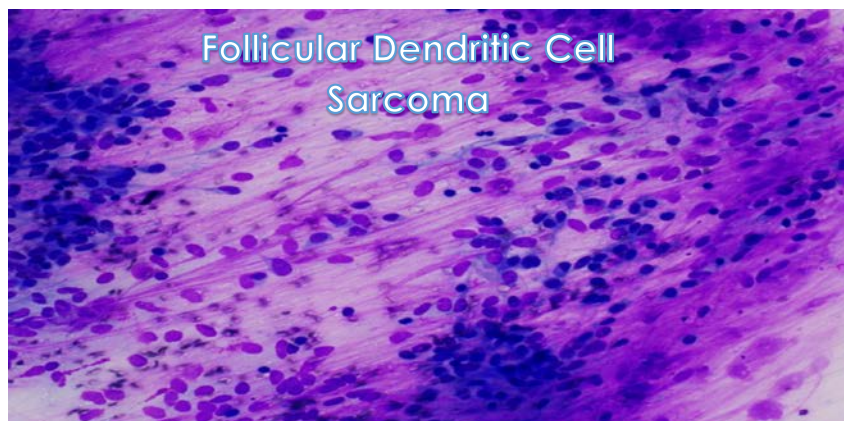
## Ms. Karen Hindmarsh

Submitted by Dr. S. Rutledge Harding

Karen Hindmarsh retired in July 2020 from her role as Supervisor in the Transfusion Medicine Laboratory (TML) in Saskatoon. She started her career in the "crossmatch lab" in 1976, working off and on for a few years while having babies. She started working full time in 1981, always in TML. Karen was the first

technologist in the local stem cell lab (aka Cell Therapy Processing lab), where she worked from 1998-2015. She then worked as TML Supervisor until her retirement. Although she'll miss the people and the work in TML, she is looking forward to trucking with her husband, Ron, spending time at her cabin relaxing, and spending more time with her 3 children and 8 grandchildren. Karen, we wish you well in all that lies ahead.

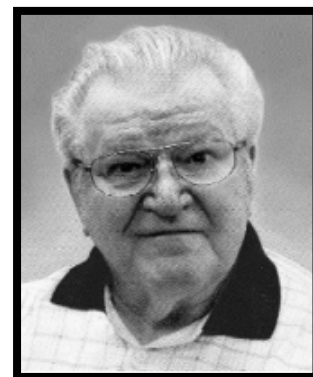
**Ms. Paula Lehto:** Happily, the TML remains in good hands with Paula Lehto stepping into the Supervisor position. Paula started working as a lab tech in 1991 at Regina General Hospital. She then worked at Canadian Blood Services (aka Canadian Red Cross) from 1998-2002 and came to RUH in 2002. Most of her work has been in TML, so she brings ample expertise to her new role. Paula lives on an acreage with her husband, Jim, and their four school-age children. They enjoy being active and spending lots of time outdoors. We look forward to working with you, Paula!







**Dr. Joseph Kane Chorney**  
**02 MAR 1932 – 11 APR 2019**



*Current members of our Department were unaware of the death of Dr. Chorney (April 2019), until we were called upon to acknowledge the deaths of Drs. Shokeir and Godsalue at a Saskatoon Region Medical Association (SRMA) Meeting in Fall of 2019. It was only at that stage that physicians in the audience at the meeting drew our attention to the death of Dr. Chorney. Unfortunately, this occurred after the publication of the Departmental 2018-19 Annual Report, but we felt it important to acknowledge the death of Dr. Chorney and recognize his dedication to patient care by including his obituary in the 2019-2020 Annual Report.*

Dr. Joseph Chorney was awarded his Pathology certification in 1961 and had a successful career at St. Paul's Hospital Laboratory in Saskatoon for 25 years. He received tributes from St. Paul's colleagues and staff, and was recognized by the Saskatoon Police for professional assistance provided over the years.

Dr. Joseph Chorney was born near Prince Albert, SK, before moving with his family at the age of four, to Diamond City, AB. While in Grade 2 there, he met his future wife, Sylvia Court (then in Grade 1)-they were married in 1955. He graduated from Medical School in 1955 (University of Alberta), obtained his certification in Pathology in 1961 and then began a long and successful career at St Paul's Hospital, Saskatoon. During his twenty-five years there he received many tributes not only from hospital colleagues but also from the Saskatoon Police Force (for professional assistance he had provided them over many years). Along the way he and his wife raised four children. After experiencing a stroke in 1965 he retired from practice. He deeply regretted having to leave his professional life and give up playing the classical guitar (which he had taught himself to play). He and his wife remained active however, travelling widely across North America, visiting with family and friends, attending concerts and theatre while he assumed a series of leadership roles with the Saskatoon Stroke Recovery Association. He found fulfillment reading the works of his scientific heroes (including Charles Darwin and Carl Sagan), while for 20 years he enjoyed weekly lunches with his great friends, the ROMEOS (Retired Old Men Eating Out). He is survived by his wife, four children, four grandchildren and three step grandchildren.

## Arrivals

### Dr. Amanda Gruza

Dr. Gruza graduated from the University of Saskatchewan, College of Dentistry in 2010 and subsequently completed a one-year general practice residency at Royal University Hospital in Saskatoon. She then spent several years in private practice as a general dentist and worked as a part-time clinical faculty member at the University of Saskatchewan, College of Dentistry. In 2019, Dr. Gruza completed her four-year, hospital-based residency through the University of British Columbia, becoming a **board-certified Oral & Maxillofacial Pathologist**, as well as a board-certified Oral Medicine Specialist. Dr. Gruza currently teaches and supervises both undergraduate dental students and post-graduate general practice residents. As of 2020, Dr. Gruza will also take on the role of Director of the General Practice Residency program at the University of Saskatchewan. Dr. Gruza also works in private practice part-time as an Oral and Maxillofacial Pathologist and Oral Medicine Specialist in the Saskatchewan Health Authority.



### Dr. Alysa Poulin

Dr. Poulin considers herself a Prairie girl, having grown up in Edmonton and Winnipeg and then returning to Edmonton where she earned her MD and PhD. Dr. Poulin moved back to Winnipeg for her residency in Anatomical Pathology and then pursued a fellowship in Pediatric Pathology at Seattle Children's Hospital after which she and her family (spouse and 3 daughters) relocated last AUG to Saskatoon. With previous training in Genetics (BSc and PhD), Dr. Poulin's favourite part of Pediatric Pathology is the perinatal portion including placentas and fetal autopsy. Welcome, Dr. Poulin!

## Dr. Deepti Ravi

Dr. Deepti Ravi joins us as a sub-specialized GI/HPB pathologist straight from her fellowship training at the University of Toronto. She is a dual fellowship holder having completed a Terry Fox Foundation funded fellowship in Applied Molecular Oncology at Princess Margaret Hospital, Toronto followed by an Anatomical Pathology fellowship with sub-specialised focus in GI/HPB pathology at University of Toronto. She completed undergraduate medical training at the prestigious Royal College of Surgeons in Ireland/ National University of Ireland followed by General pathology residency training at McMaster University. Dr. Ravi's research interest lies in molecular GI/HPB pathology and residency education.



## Dr. Nicholas (Nick) Baniak

Dr. Baniak completed his undergraduate degree, medical school, and general pathology residency at the University of Saskatchewan. Having just completed his Genitourinary pathology fellowship at Brigham and Women's Hospital with Dr. Michelle Hirsch, Dr. Baniak joined the Anatomical Pathology team at SCH in JUL 2020.



## Dr. Ahmed Mostafa

Congratulations to Dr. Mostafa, Director, Dr. Marc Baltzan Histocompatibility (HLA) Laboratory, in St. Paul's Hospital for having passed American Society for Histocompatibility and Immunogenetics (ASHI) requirements to become our fully accredited ASHI lab director.

Dr. Mostafa is an Assistant Professor in the Department of Pathology and Laboratory Medicine at the College of Medicine at the University of Saskatchewan. Dr. Mostafa is an ASHI Certified Laboratory Director and ABHI Diplomate. In addition, he serves as the Clinical Co-Director of the HLA Laboratory in St. Paul's Hospital. Dr. Mostafa completed a Doctoral degree in Immunology and Infectious disease at Memorial University of Newfoundland, St John's NL and then trained in Histocompatibility and Immunogenetics at the University of



Calgary and Alberta Precisions Lab. Dr. Mostafa is a member of the American Society of Histocompatibility and Immunogenetics (ASHI) and member of the Canadian National Human Leukocyte Antigen Advisory Committee with several years of experience in the field of HLA and transplantation in which he has published extensively. Dr. Mostafa is particularly interested in developing clinically applicable assays to improvise, enhance and supplement the current histocompatibility assays and to look into the clinical outcomes based on the interpretation of various HLA lab testing data, Identify the characteristics of HLA and non-HLA antibodies which results in antibody-mediated rejection (AMR) in solid organ transplantation and Identifying the characteristics of KIR genes and influence of GVHD.

### **Dr. Barry Kyle**



Dr. Kyle's clinical chemistry fellowship training at McMaster University Medical Centre was a rewarding two years that allowed him to grow his skill set beyond classic chemistry-based laboratory medicine. Following this, he spent two years in Edmonton further evolving his expertise to include facets of hematology and hemoglobinopathy investigations. Continuing to participate in teaching and research in both chemistry and hematology laboratory medicine, and regularly contributing to national working groups in these topic areas, Dr. Kyle looks forward to collaborating with the many talented clinicians in Saskatchewan.

**Dr. Sarah Tehseen:** We are pleased to have Dr. Tehseen back from her recent maternity leave (Yahya Anees arrived 29 DEC 2019). In addition to her previous duties, she has accepted responsibility for overseeing Cellular Therapy Processing. Sarah will be leading the work to procure FACT accreditation and prepare CTP for the anticipated development of the CAR-T program by the Saskatchewan Cancer Agency.

### **Dr. Marcela Ruano**

Dr. Ruano joins us as a Locum in North Battleford. She received her MBChB (Bachelor of Medicine Bachelor of Surgery) degree at the National University of Colombia, Bogotá, in 2002. After a few years of practice as a family physician, she completed her Anatomical Pathology residency at the U of A in 2018 and will be challenging the RCPSC Fellowship Examination in AP in the Fall of 2020. We wish her the best and extend a warm "Welcome, Dr. Ruano!"







Drs. Marisa Chard, Alysa Poulin, Marilyn Kinloch and Allison Osmond

AUG 2019 on the Prairie Lily cruise.



New radiation oncologist Kate Johnson, new Gynae oncologist, Vickie Martin with Dr. Marilyn Kinloch.

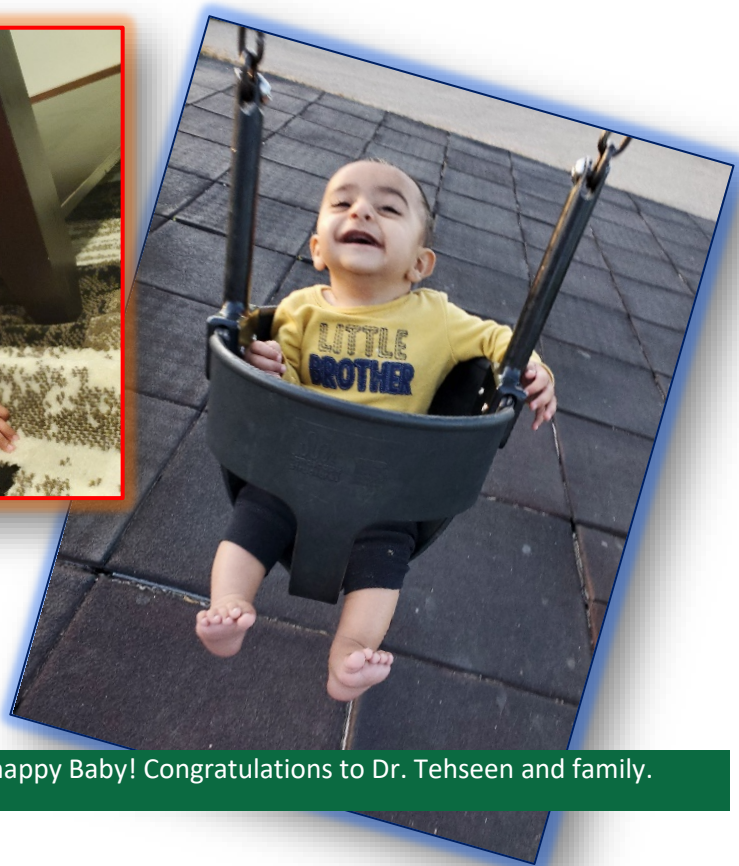


**Iris Hamula**  
(daughter of Dr. Camille Hamula)

Iris, who turned 1 year old on 30 JUL 2020.  
Congratulations to Dr. Hamula and family!



**Yahya Anees**  
(son of Dr. Sarah Tehseen)



What a happy Baby! Congratulations to Dr. Tehseen and family.

## Profiles



### INTERVIEW with Dr. Edward (Ted) Alport Area Department Lead Regina

*By Dr. Fergall Magee, Provincial  
Head*

## Reflections on a Leadership Career in Laboratory Medicine

Dr. Ted Alport obtained a BSc (Hons) followed by his MD at the University of Alberta (Edmonton). His rotating internship was in Toronto Western followed by a General Pathology Residency at the Mayo Clinic, Rochester Minnesota and a Master's of Science in Pathology at the Mayo Graduate School of Medicine. He then returned to Regina, initially as a Clinical Assistant Professor, acquiring appointments to the Allan Blair Cancer Centre, Canadian Blood Services (Medical Director), the North Central Cancer Treatment Group (Mayo Clinic, Rochester), and has been Medical Director for Regina Laboratory Medicine for almost 30 years. For two years in the late 90's he held the title of Chairman of the Medical Advisory Committee (now Chief of Staff) - more about that below. Along the way, he has lived through the organizational evolution of Saskatchewan Health Care delivery, as it moved from the Regina Health District Laboratories, to the Regina Qu'Appelle Health Region, then the Saskatchewan Health Authority and now integration of Provincial Laboratory Medicine.

#### ***What were the 'highs' of your career in Laboratory Medicine in Regina?***

Prior to 1992, the three hospitals had separate boards, administration and a private sector who did all the community testing and had the only LIS. With creation of one health district, I was tasked with leading our team through the merger to a new service delivery model based in two hospitals. All sites had different histories, cultures, administrations and unions. As part of

the project, all the community work was insourced to the hospital sites and the first district wide LIS was introduced. Interestingly, the newest institution (Plains Health Centre) did not remain a health centre but was 're-invented' as part of the then SIAST - now known as Saskatchewan Polytechnic campus.

#### ***What was a 'low' that occurred during your laboratory career here?***



The most challenging experience was living through the Krever Inquiry.

This was an inquiry of the Blood System in Canada commissioned by the Federal Government in 1993 and headed by Justice Horace Krever, which spent four years investigating the 'tainted blood' tragedy. This was a response to the infection of at least 2000 Canadian recipients of blood and blood products with human immunodeficiency virus between 1980 and 1995. Many others who received transfusion products were infected with hepatitis C.

I particularly remember spending two full days under cross-examination in a room with up to thirty lawyers, many plaintiffs and media. Fortunately, Saskatchewan was a small player and most of the decisions were made in Ottawa, but it was stressful none the less.

***Are the problems in Laboratory Medicine different today?***

Not really. The issues are the same - the challenges of budget, human resources are similar, but the pace of change is so much faster. In our new world of rapid increase and dissemination of information - just think about the explosion in genomic knowledge or the arrival of artificial intelligence. And the 'asks' are significantly increased - consider demands for new clinical tests or more detailed surgical pathology reports for cancer are compared to twenty years ago. Current practice requires increasing detail and occurs in a world of increasing media scrutiny.

***What was the greatest learning event of your career?***

My time as effective Chief of Staff. This experience provided me with an extremely thorough education into how

our health system works work. It also taught me that the health care administration can be a difficult job that many physicians don't fully appreciate.

***If you had not become a pathologist, what alternate career would you have pursued?***

I had not intended to be a physician at all! I had always wanted to pursue a career in Environmental Sciences. I love nature and saw many opportunities and challenges in pursuing a career in that field, but I got sidetracked into medicine (please see my answer to the next question!).

***What was the best advice you have ever been given, and by whom?***

It was given by my parents, both of whom were physicians. They were the ones who advised me to accept the place that I had been offered in Medical School. They told me that becoming a physician would provide me with a challenging but rewarding career, and that if I wanted to, I could always go back to Environmental Sciences. But as I already said, I am still side tracked!

***What makes you get up in the morning and come to work?***

The most rewarding part of my day is actually service work. Surgical Pathology is like solving a puzzle - you try to sort out the clinical and pathologic clues to make a diagnosis. "Solving" a difficult case can be very rewarding. The highlight (happens rarely) is when a clinician says "yes - that explains everything, thank you so much". Administration can also be rewarding but the feedback loop takes so much longer and decisions made today can



only be appreciated (for better or worse) with the perspective of time.

***What advice would you have for recent graduates starting a career in Laboratory Medicine?***

I think that modern graduates need to pursue sub specialization and need to be literate in genomics. They also need to be 'life-long learners'. They also need to get out of the laboratory - meet and interact with their clinical colleagues and learn how the system works. It will make them better pathologists.

***What advice would you have for future leaders in Laboratory Medicine?***

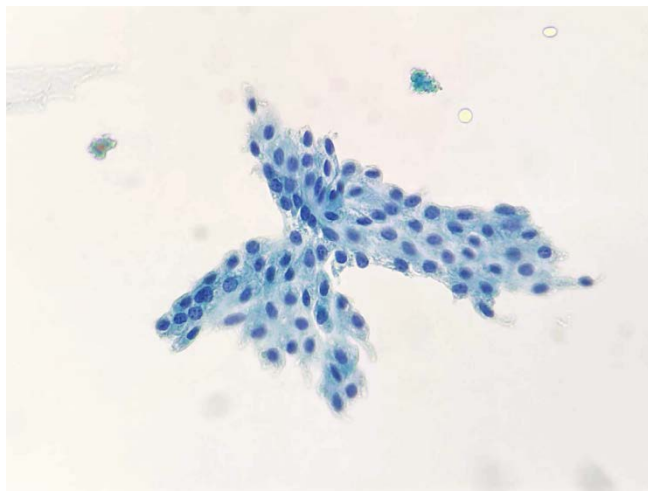
Leaders in Laboratory Medicine face a demanding job. They will be asked to deal with many pressing issues in their workplace by colleagues who want quick solutions. They need to realize however, that health care is complex - with many moving parts - and change in such organizations takes time, sometimes a lot of time. I think that the capacity for patience is an important skill set that they need to develop.

***On the world stage, what is your greatest worry?***

The ability to google anything and give us unlimited information is amazing. But the trouble is that it's getting increasingly difficult to separate fact from fiction (editorial bias, misinformation and alternate facts). One of the casualties appears to be less respect for science and academia, and less trust in our institutions. Not sure where this is taking us.

***On the world stage, what do you see as the greatest success that you have lived through?***

I missed out on the 'sixties' but there is something powerful about social movements – almost always lead by the young. Social movements of the sixties effectively stopped the Vietnam War, liberated women and improved civil rights (votes for African Americans). Time will only tell if in today's social movements, (protests for the green economy, gun legislation, black lives matter), will be equally effective.



Percutaneous fine-needle aspiration of Mesothelial cells of the lung

*Dr. Yayuan Zhao PGY1 (2020-2021) captured this cytology "Butterfly" image with his phone directly through the microscopy to memorize the moment.*



## INTERVIEW with Dr. Bruce Murray

Medical Lead of Laboratory Medicine  
- North

By Brandi Keller, Director Laboratory  
Medicine - North

*Dr. Murray is a Clinical Associate Professor in the Department of Laboratory Medicine and has been a faculty member of the College of Medicine for 30 years. During that time, he has been an active participant in national, provincial and local activities related to the practice of Laboratory Medicine and in Administrative duties related to Laboratory and Clinical Medical Practice. The last 10 of those years have been spent in the North West Area of the province.*

*Brandi Keller was born and raised in North Battleford where, after earning her Medical Laboratory Technologist Diploma has worked steadily to obtain expertise in the practice and management of Laboratory Medicine, through certification in Lean, the Saskatchewan Leadership Program and Laboratory Quality Management. Brandi also sits on a number of provincial and national committees related to Laboratory Quality.*

*She and Dr. Murray have been working together as the Dyad Leaders for Laboratory Medicine in the North for the last 2 years.*

**What brought you to North Battleford to work in a rural laboratory?**

*I originally came to North Battleford to take on a part-time administrative position as Senior Medical Officer for the former Prairie North Health Region, while continuing Laboratory Medicine practice in Saskatoon. When the previous pathologist for PNRHA retired, it just made sense for me to take on that work as well to become a fulltime practitioner in the West. Over time, my enjoyment of the challenges of rural laboratory medicine brought me back more into a fulltime laboratory practice.*

**What is the most satisfying part of working in a rural pathology laboratory? Most challenging?**

*The most challenging **and** satisfying part is interacting with clinical staff in order to raise the profile of laboratory services and provide clinicians with an understanding of the role the laboratory plays in day to day clinical services. Satisfying, when we are successful and see how easy it is to establish a personal dialogue with clinicians, challenging as it's a slow process and requires a lot of travel, discussion and thought. The communication links amongst clinicians, lab and administration are in many ways*

shorter and more in direct in rural practice.

**If you could improve one thing in rural northern laboratories, what would it be?**

One of the missing links is the lack of complete electronic connectivity between rural and urban, and between clinicians and the laboratory.

Secondly, improved transportation. A fully functioning transportation service amongst laboratories is critical to the success of the laboratory in order to support patient care.

**What is your ultimate vision for Northern Laboratory Services of the future?**

To me, it's to take advantage of the new technologies including point of care testing and ensuring our test menus are supporting our clinicians in providing quality patient care.

**What advice do you have for a pathologist considering a rural position?**

Get out of the Lab! Be a participant in all clinical areas, the impact of attending meetings is huge. Being a participant in local administration, taking part in Medical Advisory Committee and other clinical committees make it so much easier to tailor the lab practice to actual local clinical needs.

**What is the most valuable piece of advice you have received?**

I think there are two pieces of advice that were most valuable to me.

A former dean of medicine once advised me on the value of patience; to not try to change things too quickly, but to move slowly, with consideration and

inclusion of all who may be impacted by change. It might take longer, but the effect would be more profound and lasting.

The second was from a CEO of a private laboratory company who said "if we are contemplating a course of action for the company, we must ask ourselves "is this action going to improve our service delivery and benefit the care of our patients?" If the answer is "yes"...then you are on firm ground and should move forward.

**On a personal side.....what do you enjoy doing while away from your desk?**

My non-medical life centers around remodeling and landscaping my home which I purchased a year ago. I increasingly spend time with family, my daughters and their children and being a grandparent.

**And, what are you looking forward to most in the next couple of years?**

I have found that whether I plan for it or not, my life focus changes about every five years. Clearly, I didn't plan on pandemic living, but it will shape to a greater or lesser extent, all our life choices for at least the next few years. I think a lot about how to adapt to our new normal and to enjoy what those adaptations might bring. For example, our pre-covid family plan of a Christmas in Jamaica might need to be altered!

**Any closing comments?**

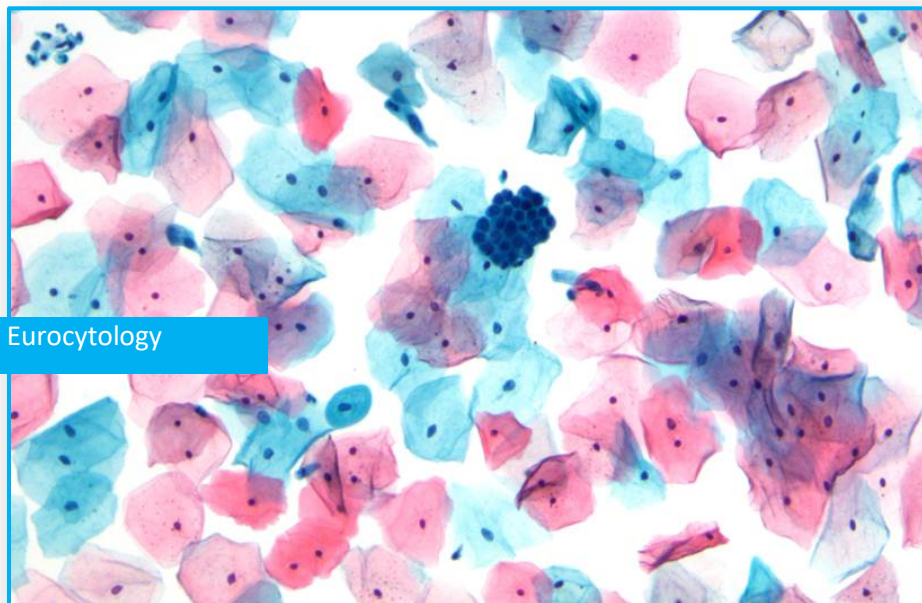
I think that the reorganization of the practice of medicine resulting from the creation of the Saskatchewan Health Authority in 2017 and its impact on the Provincial Department of Laboratory Medicine has been one of the most

*important, and influential forces in medical practice in my career. It included the recognition of the strength that a DYAD leadership model, partnering medical practitioners and content administrative expertise can offer to patient care.*

*I have enjoyed being part of that structure and the realization of progress that can be achieved with such a partnership.*

**It's always a pleasure to chat with you!  
Thank you, Dr. Murray.**

*Brandi Keller*







# SOCIAL ACCOUNTABILITY

## Departmental Social Accountability

In 1995, The World Health organization defined social accountability as the obligation [of medical schools] to direct their education, research and service activities towards addressing the priority health concerns of the community, region, and/or nation that they have a mandate to serve. The priority health concerns are to be identified jointly by governments, health organizations, health professionals and the public.

The Division of Social Accountability within the College of Medicine (U of S) is dedicated to health equity, anti-racist education, community-based research, advocacy, authentic partnerships and the health needs of underserved and marginalized communities. The Division engages with and learns from our communities to support relevant, meaningful, and impactful health professional education, research, service and advocacy.

As a Provincial Department, our strategic plan must align to those of the Saskatchewan Health Authority (SHA) and the College of Medicine (CoM). We share the principles expressed in the CoM statement as it relates to Social Accountability:

*As a socially accountable organization, we improve health through innovation and interdisciplinary research and education, leadership, community engagement, and the development of culturally competent, skilled clinicians and scientists. Collaboratively and mutually beneficial partnerships with Indigenous peoples and communities are central to our mission.*

Provincial Laboratory Medicine honors three inter-related mandates - clinical care, academia and public health.

### Clinical Care and Public Health Mandate

Our clinical care and public health mandates require that we implement a culture of safety, enhance connected care and deliver improved access to ensure optimal patient outcomes. The Department engages with individuals who are marginalized or 'at-risk' and who live in urban, rural or remote areas, all of whom require timely access to an

appropriate portfolio of laboratory testing. Specific examples around improved access to appropriate diagnostics, currently underway include:

1. Rural placement of genomic diagnostics (GenXpert) to improve access to the diagnosis of infectious disease, including COVID-19. Instrument validation and training was provided to

facilitate placement of many of these testing platforms in area under Federal authority, but we have striven to create a culture of 'access' not 'jurisdiction'.

2. Patriation of cancer genomic testing to provide significantly shorter turn-around times with earlier treatment interventions.
3. Implementation of liquid based cytology (LBC) for earlier diagnosis of cervical cancer, a disease with significantly poorer outcomes in rural and remote areas.
4. Implementation of non-fasting lipid testing to enhance patient test experience.
5. A proposed implementation of newborn screening for Severe Combined Immune Deficiency (SCID), a disease with a significantly higher incidence in two populations in Saskatchewan - northern Cree and Mennonite.
6. Initiatives to enhance access to end-stage renal disease diagnosis - a condition with higher frequency and poorer outcomes in rural and remote populations.
7. Engagement with transgendered patient groups as we seek to understand the specific health needs of this population and to learn how to provide a culturally appropriate practice for these vulnerable patients.

Between 2016-2019, Dr. Henrike Rees, a Department Pathologist, has participated in and co-led four annual medical missions, primarily intended as surgical initiatives, to a hospital in Port au Prince, Haiti. This team is part of the national Team Broken Earth, a volunteer task force composed of physicians, nurses and other allied health professionals from across Canada.

During these trips, Dr. Rees met daily with pathology residents and pathologists for formal teaching sessions.

In 2019, through "Academics Without Borders", Dr. Rees spent two weeks at the teaching hospital for the University college in Moshi, Tanzania to provide education support and material



to local pathologists in the management of advanced breast and cervical cancers. In the meantime, Dr. Rees has made herself available as a remote digital pathology consultant for the Kilimanjaro Christian Medical Centre (KCMC) in Moshi.

Initiated by a Department faculty member and now a member of the Provincial Executive Committee, based in Moose Jaw, Dr. Viktor Skihar, and supported by many individuals and organizations in Saskatoon, a Health Initiative continues to collect medical supplies, medications and equipment for shipment to physicians in Ukraine. To-date, over one ton of supplies have been shipped to six different volunteer organizations in Ukraine.

### **Academic Mandate**

The department has created a Departmental Research Committee change with promoting multidisciplinary, distributed research and encourages that these initiatives be directed to rural and remote populations.

Laboratory Medicine is the 'science behind the cure' - up to 70% of medical decisions are based on some form of Pathology & Laboratory Medicine (PaLM) result. While PaLM has a long history of successful researchers with CIHR success, we have recognized the need to promote involvement of many other departmental members in research initiatives. Today our Department stands on a number of cusps – *structural* - the transition to a provincial laboratory system is underway and gaining speed, *educational* - Competence by Design, introduced to our residency program in July of 2019 and *technological* - a genomic revolution is under way in all of our diagnostic Laboratories. These changes provide opportunities for PaLM to try to honor the **vision** (to become leaders in improving the health and well-being of the people of Saskatchewan and the world) and **mission** (to improve health through innovative and interdisciplinary research and education) of the CoM by stimulating a spread of research capacity and improved clinical care through a distributed multidisciplinary system. This will lead to improved health outcomes for the patients of Saskatchewan from initiatives as diverse as greater leverage of 'Point of Care' technology and telemedicine, engagement with indigenous communities around implementation of novel and enhanced testing for specific disease diagnosis or more detailed outbreak analysis to improve public health.

We see on-going opportunity to promote resident involvement in research, enhance knowledge translation and foster a culture of community-engaged, multidisciplinary and distributed inquiry.

Specific examples of such research include:

1. Pilot study for IgA nephropathy-a renal disease with higher frequency and poorer outcomes in Indigenous populations.
2. COVID-19 Serological studies in various populations.
3. A provincial initiative to enhance POCT access and patient outcomes in rural and remote areas.
4. A proposed Human Papilloma Virus –Self Testing - to improve outcomes for cervical carcinoma in rural and remote areas.

As the province begins a resumption of services, the Department is striving to engage with primary health care providers to promote enhanced test utilization and ensure that we move to a '**better normal**'.

The Department continues to be committed to the integration process. Our strategic plan is in alignment with SHA and Provincial Programs through utilization of common roadmaps (Objectives, Key Results and Principles) and domains that include culture of safety, connected care, clinical leadership and system integration. This strategic plan is undergoing continual evaluation and development by means of regular reviews.



# LABORATORY PRACTICE

## Provincial Microbiology

By Dr. Joseph Blondeau, Clinical Lead, Microbiology Dyad

The COVID-19 virus was first reported from Wuhan China in December of 2019. New cases were quickly recognized from other countries around the world and in March of 2020 the World Health Organization considered COVID-19 to be a global pandemic. Saskatchewan saw its first cases of COVID-19 in March of 2020 and since that time the Clinical Microbiology program across the province has undergone a tremendous realignment and metamorphosis in order to deal with the additional testing demands associated with the pandemic.

By way of history, the creation of the Saskatchewan Health Authority was followed by the creation of provincial programs. Pathology and Laboratory Medicine was identified as a provincial program such that decisions related to staffing, technology, testing etc. are now being considered based on provincial needs including the ability to deliver the same essential basic services to all citizens of Saskatchewan.



Laboratory services in both Saskatoon and Regina became the referral centers for the north and south respectively. Clinical microbiology came together as a provincial discipline and immediately began working on both local and provincial initiatives. The Provincial Microbiology program had made tremendous gains in terms of understanding the current state of clinical microbiology services across the province and beginning the process to standardize and rationalize where possible. The COVID-19 pandemic provided a further opportunity for clinical microbiology services to be considered from a provincial perspective. As

demands increased for COVID-19 testing, so did the need to increase capacity for testing in Saskatoon and Regina and to introduce Genexpert technology and testing in many other cities and rural communities throughout the province. This has been a great success. Part and parcel of the preparedness to handle the surge in testing for COVID-19 came to realization that technology was badly needed in Saskatoon, Regina and in rural centers still doing microbiology testing.

The provincial microbiology group have been amazing. Resilience shown by each and every member of the group



has been nothing short of remarkable. With many aspects of the COVID-19 pandemic changing weekly and sometimes daily, the adaptability of the microbiology group to respond to changing priorities has been admirable. We are fortunate to have such a strong, collaborative and cooperative group in the province.

One highlight worthy of mention was the responses from the University of Saskatchewan and University of Regina in offering up equipment, reagents and plastics during the early days of the pandemic. At that time, supply-chain availability of materials necessary for testing for COVID-19 were in short supply or backordered. On some days we were close to being depleted. Various individuals from both universities unselfishly put up technology and supplies to help with the testing of

COVID-19. Additionally, some also offered up staff who were trained with the use of that technology. As of August 2020, two kingfisher extractors borrowed from the University of Saskatchewan are still in use at Royal University Hospital as part of the testing for COVID-19. This amazing show of community responsibility during such uncertain times is overwhelming and clearly shows we are “one” community.

In the early days of the pandemic, we enacted an essential services test menu province wide. This essentially meant we focused testing on acute and critical care patients. This was seen as necessary so as to free up staff to be trained on molecular technology and protocols. This was an enormous success and tripled the number of trained staff. We returned to a full service test menu in June, 2020.

### **Total Laboratory Automation**

Clinical microbiology has been one of the last areas in Laboratory Medicine to see automation. Most of the testing in microbiology still involves manual manipulations and interpretation of culture results to determine significant from insignificant findings. Over the past decade, automated technology in clinical microbiology has evolved. It is however expensive and only practical for two laboratories within Saskatchewan: Royal University Hospital in Saskatoon and the Regina General Hospital in Regina. With the emergence of the COVID-19 pandemic, we have been successful in elevating provincially the need of total lab automation in microbiology and the provincial programs leadership in turn have identified this technology as a priority for fundraising with the hospital foundations. This will cost between \$5.5 and \$6 million to automate the laboratories in Saskatoon and Regina. Such technology will equip these laboratories for decades to come.

### **Technology**

The following is a listing of technology acquired as a result of the COVID 19 pandemic. New technology involves ordering, delivery, installation and validation before the instruments can be put into operation:

### Saskatoon

- 1) 2 Bactec Blood culture units to increase blood culture bottle capacity during surge requests
- 2) BD Max – first unit arrived in June 2020. The 2<sup>nd</sup> unit will arrive in August 2020. These instruments run multiplex PCR assays
- 3) 24 (2 units) and 96 Magnipure extractors for nucleic acid extraction from patient specimens:
- 4) Borrowed Kingfisher extractors (2). Instrument installed, validated and operational. Saskatoon purchased its own Kingfisher extractor which is installed, validated and in use.
- 5) 2 liquid handling units microtiter plates and pipetting

### Regina

- 1) Bact T Alert System (BioMerieux virtuo) blood culture instruments
- 2) KingFisher extraction – 1
- 3) Thermo 7500's – 2
- 4) Quantstudio12Klex – 1
- 5) Integra VIAFLO384 – 2
- 6) Qiagen Qiacube HT – 2
- 7) AutoGen FlexStar – 1 (really for genetics) But this instrument has allowed us to take back staff from Genetics to Molecular.

### Lloydminster

- 1) Bact T Alert Blood Culture System arrived the week of April 20<sup>th</sup>. Technologist from North Battleford went to Lloydminster to help with installation and training.

### Moose Jaw

- 1) Bact T Alert Blood Culture System.

### Swift Current

- 1) Bact T Alert Blood Culture System

### Prince Albert

- 1) Vitek system for organism identification and susceptibility testing (from RFP)

### Yorkton

- 1) Vitek system for organism identification and susceptibility testing (from RFP)

### **New Equipment on Order (Saskatoon/Regina)**

- DS2 – Galactomannin assay instrument
- Sensititer – Yeast/bacterial susceptibility instrument
- 2 Isoplacers – one Saskatoon RUH and one Regina General
- Biological safety cabinet for RUH Micro
- Ultralow Freezer – RUH Micro

## **Pending approval**

Funding for 4 additional BD Max instruments have been submitted for approval. These units would be placed in Prince Albert, Yorkton, North Battleford, and either of Moosejaw or Swift Current.

## **Provincial Microbiology Discipline Accomplishments during COVID-19**

### COVID related:

- Validation and implementation of COVID-19 testing in 19 rural laboratories.
- Improved turn-around time of COVID testing in Northern Saskatchewan, through increased transportation routes and Saskatoon performing testing rather than transport to Regina.
- Implementation of pandemic laboratory requisition????
- Implementation of COVID-19 GeneXpert testing algorithm to support appropriate usage of limited tests received provincially.
- Increased blood culture capacity provincially.
- Staff training has increased exponentially in Saskatoon and Regina for molecular testing technology and protocols

### Non COVID related:

- Influenza A/B, RSV validated in 19 rural labs.
- In progress – TB implementation in 9 rural labs.
- In progress – urine culture standardization provincially.

## **Staffing**

To meet the anticipated demands of increase testing for COVID 19, 30 additional temporary laboratory position have been approved for hiring and training. This will start in August 2020.

## **Thanks to**

- 1) Our amazing staff
- 2) Physicians for working with us through our restricted test menu period
- 3) Our leadership for supporting the funding requests based on identified needs
- 4) Ministry of Health for working with leadership on multiple initiatives
- 5) The Hospital Foundations for being so receptive to laboratory technology needs and providing funding
- 6) Our vendors for working with us under such trying conditions to provide us with technology and supplies.

## Biochemistry by Dr. Andrew Lyon, Clinical Lead, Biochemistry Dyad

Co-Leads: Keri Crawford & Dr. Jeff Eichhorst

Members of the Biochemistry discipline group became acquainted during monthly meetings. The initial discussions regularly involved the conflict between the need for people to perform new provincial work for the inclusive terms of reference when those people were already fully employed performing local duties as pathologists, biochemists, directors, managers, senior technologists or quality specialists. We focused on a few priorities.

Initial accomplishments included: standard reporting levels for critical acetaminophen and hyperkalemia, joint work with Hematology to avoid inappropriate ESR testing and promote CRP testing, planning new RFP committees, selection of quality indicators (stat or urgent troponin TAT), proficiency testing improvement for urinalysis, improved access to toxic alcohol testing for northern labs with couriers to Saskatoon. Group members participated in numerous roles to plan lab service contraction and resumption during the Covid-19 pandemic as well as planning Covid hospitals and field hospitals.

Dr. Jeff Eichhorst retired in April and Dr. Andrew Lyon became a co-lead. During the next year the group will work to define how the biochemistry discipline and geographical leadership interact in a matrix. The next year will involve new automated chemistry and immunoassay instrumentation implementation in Regina hospitals and at RRPL and committee work for contracts for both rural and urban areas.

## Advanced Diagnostics Research Laboratory (ADRL)

by John DeCoteau, MD, FRCP(C)  
ADRL, Medical Director

Molecular pathology is a technology intensive discipline that has assumed an increasingly important role in the care of cancer patients by allowing pathologists to quickly identify mutations that have diagnostic, prognostic, or therapeutic implications. While the recent development of some new technology platforms has simplified the analysis of single genes, much of the field involves surveying tumors for mutations in 10 to 50 genes at a time using complex protocols such as next generation sequencing (NGS). The value of high complexity diagnostics for cancer care can be seen in three rapidly growing areas of molecular pathology:





### Actionable Diagnostics

This category includes **companion diagnostics** that are needed to quickly identify those cancer patients most likely to benefit from the expanding list of targeted therapies directed at specific genetic abnormalities in cancer cells. Examples of targeted therapies include imatinib for patients with BCR-ABL + chronic myeloid leukemia, and osimertinib for patients with advanced lung cancer that have epidermal growth factor receptor (EGFR) mutations.

**Risk stratification** is an important element of actionable diagnostics that assesses mutation profiles in cancer cells to provide treatment road maps that do not necessarily involve the use of targeted therapies. An important example includes acute myeloid leukemia risk stratification panels that can help determine if patients should be treated with standard chemotherapy vs. intensive allogeneic bone marrow transplantation.

### High Sensitivity Monitoring

Vastly increased sensitivity afforded by new molecular pathology techniques allows treating physicians to safely reduce, or cease, toxic therapies in patients achieving 'deep' remissions. The advent of minimal residual disease (MRD) detection protocols, capable of identifying a single leukemia cell amid a background of 10,000 to 100,000 normal cells, now permits reduced cycles of chemoimmunotherapy in patients achieving MRD negative status.



High sensitivity monitoring can detect imminent relapse days to weeks earlier than traditional diagnostic approaches. Identifying early cancer recurrence provides Saskatchewan Cancer Agency (SCA) clinicians with opportunities to modify treatment before unsalvageable disease progression occurs.

### Minimally and Non-invasive Diagnostics

Related to high sensitivity monitoring is the improvement in minimally and non-invasive cancer diagnostics. The increased sensitivity permits the detection of actionable mutations in cancer patients using minimally invasive biopsy specimens and even blood samples ('liquid biopsies').

The Advanced Diagnostics Research Laboratory (ADRL) was created in 2012 with a mission to contribute to optimal cancer care in Saskatchewan by providing sustainable, state-of-the-art acquired cancer diagnostic and monitoring laboratory services, responsive to the evolving needs of patients and members of their care team, through the integration of research and clinical reporting activities.

The ADRL holds a lab license issued by the Saskatchewan Ministry of Health and is accredited by the Western Canada Diagnostic Accreditation Alliance (WCDAA). Since its inception, the lab has developed and validated key high complexity cancer tests to ensure that standard of care testing is made available to SCA clinicians managing a variety of solid tumors and hematologic malignancies. The ADRL also continues to leverage its expertise in companion diagnostics and high sensitivity monitoring to implement minimally invasive and liquid biopsy approaches that are destined to become standard of care tests in the near future.

Some key accomplishments of the ADRL in support of patient care include:

### **Improved Cancer Diagnostics with Reduced Reliance on Referral Testing**

The test menu offered by the ADRL is now comparable to those at all major oncology centers in Canada. Maintaining an updated cancer test menu at the ADRL, that is aligned with the needs of modern oncology practices, will continue to reduce Saskatchewan's reliance on outside institutions to provide cancer diagnostic and monitoring tests.

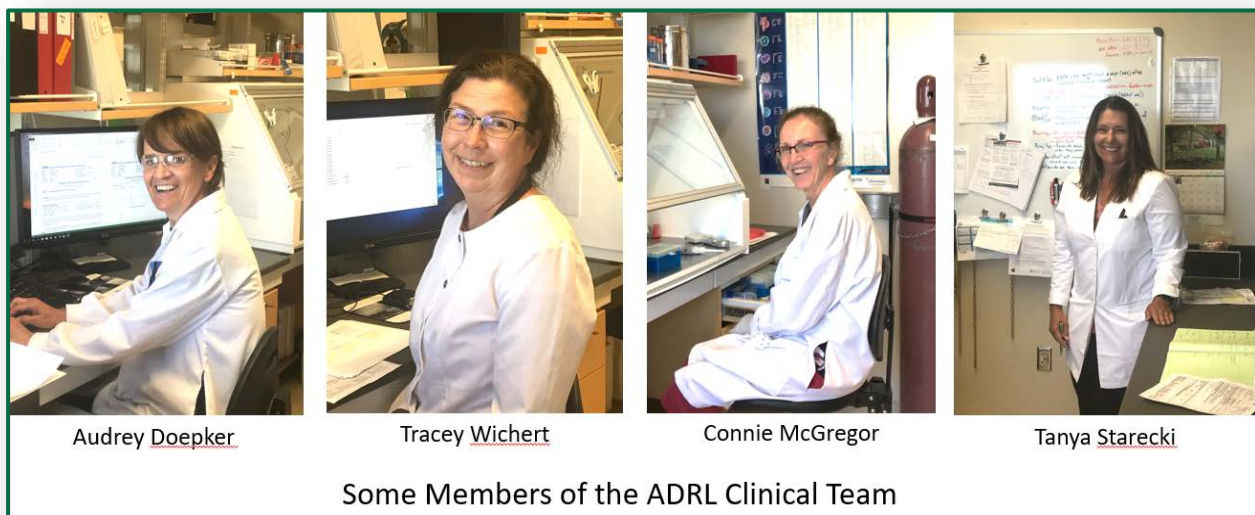


### **Increased Test Volumes to Meet Provincial Demands**

The ADRL has been very successful in repatriating a large number of cancer tests previously referred out of the Province. The lab also has a proven track record of keeping pace with cancer discovery, and rapidly responding to the clinical demands for developing, validating, and implementing new companion diagnostics. The number of tests that will be performed and reported by the ADRL in 2020 is projected to exceed 3,200. Prior to the ADRL becoming operational, all of these tests were either referred outside of the Province or not performed at all, to the detriment of optimal cancer care.

### Process Improvement for Lung Cancer and Ovarian Cancer Diagnostics

As the ADRL performs all of the EGFR mutation testing for Saskatchewan patients with advanced lung cancer, the lab has the opportunity to carefully track EGFR mutation testing turnaround times and identify sources of test reporting delays. Work done by the ADRL, in collaboration with Dr. Mary Kinloch, Head of Anatomic Pathology, identified several pre-analytic sources of delay that could be eliminated by streamlining sample acquisition. Institution of reflex testing has resulted in dramatic reductions in the turnaround time for EGFR testing in Saskatchewan compared to out of province referral testing. The implementation of ADRL EGFR mutation detection methods also reduces the need to perform repeat testing in order to assign EGFR mutation status. Advanced lung cancer positive for EGFR requires urgent therapy with specific targeted inhibitors - the decreases in test wait times and repeats offer a significant advantage to these patients.



Rapid testing of ovarian cancer tissue for BRCA1/2 mutations is needed to identify all patients with the BRCA-mutant form that can dramatically benefit from treatment with a new class of drugs called PARP inhibitors. Identification of BRCA1/2 mutations in ovarian tumor tissue also triggers hereditary testing to determine if the mutation is inherited. Current reporting times for out of province referral testing are eight weeks for BRCA1/2 results on tumor samples. Building on previous work by the ADRL in repatriating out of province referral testing for lung cancer patients, it is expected that implementing the test locally, and streamlining pre- and post-test processes, will dramatically reduce wait times for patients and their oncologists to receive test results needed to guide care.

The ADRL relies on a robust R&D capacity

to keep pace with cancer discovery and rapidly respond to the clinical demands for developing, validating, and implementing new high complexity tests. The lab currently has 13 new tests undergoing technical or clinical validation in anticipation of clinical

implementation by 2021. These tests include: a brain cancer actionable mutation panel; comprehensive actionable gene fusion panels for newly diagnosed acute myeloid leukemia and lung cancer patients; somatic BRCA1/2 mutation detection in ovarian cancer; molecular MRD monitoring in acute leukemia patients; and detection of EGFR drug resistance mutations in blood specimens from lung cancer patients.

The ADRL is also a key local resource that supports clinical trial activities; translational and patient oriented research; and the training of pathology residents, graduate students, and highly qualified technical personnel. The ADRL continues to work closely with the Center for Biologic Imaging Research and Development (C-BIRD) directed by Dr. Ron Geyer to provide support on a variety of biologic imaging research and development projects.

## Flow Cytometry Lab (RUH)

By Dr. Kathy Jafari

Flow Cytometry (FC) immunophenotyping is a powerful methodology that enables analyzing the expression of surface and intracellular molecules which help hematopathologists to characterize different cell populations. FC is primarily used as a diagnostic tool for classification, staging, and monitoring of hematolymphoid neoplasms such as leukemias and lymphomas. As such, FC is a crucial service in cancer care. It is also frequently used in evaluation of patients with immunodeficiencies.

RUH flow cytometry lab is the larger of the two centers in the province and provides service to both adult and pediatric patients. In the last one and a half years, the FC team including technologists and hematopathologists worked hard to adapt the state of the art 10-color flow cytometry.

Currently the primary focus of the flow cytometry lab service at RUH is hematological malignancies and in this field, the services it provides are comparable to other large referral flow cytometry labs. Our lymphoma and Leukemia screening panels use 14 antibodies in each tube which enable hematopathologists to maximize the obtained information and provide an immediate and accurate diagnosis even in small biopsies and paucicellular specimens such as CSF. It is also very cost-efficient way of testing for many disorders at once. This approach is also used in a specially designed so-called "screening tube" where in just one run it is possible to sort out if there are pathological findings and which cell type is involved even when very little is known about the patient. The flow cytometry lab offers complete work up of acute leukemia, lymphoma, myeloma, pediatric lymphocyte subset, CD34 enumeration, and CD4/ CD8 subsets. The lab has one Navios and one FC500 instruments and runs with 3 full time technologists. In the past year, the lab analyzed 1400 lymphoma, leukemia, and immunodeficiency specimens, 3000 HIV specimens (CD4, CD8, CD3) and more than 200 CD34 stem cell harvests.





Flow cytometry is a highly complex test and requires thorough understanding of biology of normal and abnormal cell subsets and their diagnostic relevance, as well as in depth understanding of technical aspects of methodology and instrumentation. Due to high level of expertise required and fast paced development in this area, flow cytometry demands continuous on job training for technologists and hematopathologists alike. Flow cytometry lab at RUH has implemented weekly rounds in 2019 to provide additional educational resource to engage everyone, to build confidence and to foster teamwork. After few months of disruption due to COVID-19, as of May, this weekly activity has been resumed virtually via WebEx, and recently our colleagues from Regina are joining this activity as well. Quality assurance is critical in flow cytometry lab. In the last year, the lab has implemented some fundamental changes in tissue processing and handling such as change of tissue disaggregation method and routine use of Transfix for CSF specimens, which improved pre-analytical quality of FC samples and patient safety. Finally, during all these changes and growing service work, the flow cytometry lab managed to increase its resiliency by welcoming and training three new technologists. Well Done Team Flow Cytometry!

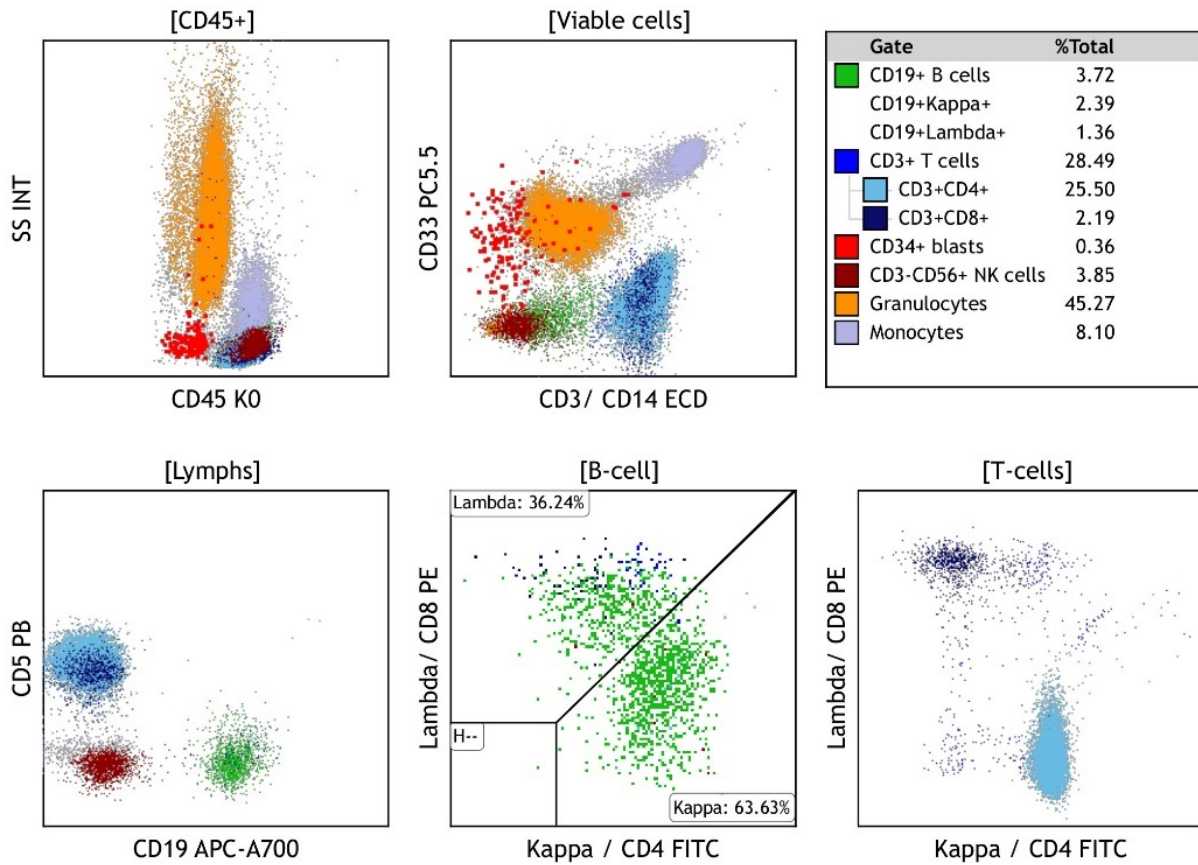


Fig 1: Selected dot plots from Myeloid/Lymphoid screening tube (MLS) at RUH on a peripheral blood of a patient presented with cytopenia.



## Anatomic Pathology-Discipline Specific Group

Dr. Marilyn Kinloch, Co-Clinical Lead  
Anatomic Pathology Dyad

The AP discipline specific group this year has been focused on working towards their goals that are rooted in the SHA pillars of Connected Care, Safety, System Alignment, Sustainability and Physician Leadership.

The pandemic provided an opportunity for the group to bring to the Hospital Foundations a virtual microscopy implementation to connect the province and Saskatchewan pathologists to outside the province for primary diagnostic and consultative services.

We were able to complete the provincial Immunohistochemistry RFP that will be implemented at the end of the year seeing an improvement to both Regina and Saskatoon's IHC capabilities; an investment of over \$7 million dollars to the lab.

The Provincial Government has given the green light to Liquid Based Cytology and work has begun with a sub-committee to evaluate platforms for this much needed technology.

The operations sub-committee has been working on a provincial requisition and exploring standardization of site-specific requisitions.

Our goal for the provincial AP service is to ensure that there is Level 6 electronic synoptic reporting for cancer patients to ensure the information bridges over to the Cancer Agency. Our group has been meeting with key stakeholders at the SCA and has partnered with Canadian Partnership Against Cancer to develop a business plan for this project. We hope this will be presented in the fall of 2020.



## Anatomic Pathology - Regina

by Angus Kirby, MD, FRCPC

There has been a dramatic change in working conditions in the Laboratory over the course of the last year with the onset of the COVID-19 pandemic. The year began with issues of the progressive strain on staffing levels and the long-term incremental increase in workload, but was subsequently punctuated by the pandemic in March, since when these issues have been thrown into temporary relief by the suspending of routing anatomical pathology work. There is now a gradual return of non-urgent work, but the specific path this will take in the forthcoming months is not clear.

### Histotechnologist/Pathology Assistant/Histopathology Technician staffing

The temporary technologist positions that had been approved to deal with a previous long-term backlog of cases in the department from late 2018 and earlier 2019 were extended through the summer, enabling the maintenance of a nearly normal workflow into the fall of 2019, with delays in processing (excepting urgent specimens) measured in days rather than weeks. These positions will need to be made permanent.

The number of Pathologist Assistants was minimal (three working full time, one of whom was largely administrative), and the workflow for surgical specimens was subject to day-to-day variability by their demands from the autopsy service, primarily for the Department of Justice, a long-term issue. The onset of the pandemic reduced service demands, however, the pathology assistant supervisor has recently resigned to pursue additional training which, with the gradual recovery of workload, leaves the

situation precarious once again. Recruitment for a replacement is underway, but the pool of candidates is small, those willing to come to Saskatchewan is smaller, and it is expected it will be many months at least before one is found. It is hoped the recent alliance of the Department of Laboratory Medicine (originally through the former Saskatoon Health Region) with the University of Calgary's Pathologist Assistant Training Program will facilitate the process.

### Pathologists

The reduction in workload since the onset of the COVID-19 pandemic has provided a temporary respite from the need for more pathologists. The Department has several unfilled funded anatomic pathology positions, with dermatopathology being a preferred subspecialty interest as one of the two who provides this service now will be retiring in the fall. One such position was expected to be filled by a candidate who began work recently but who has since decided not to take the position. A



candidate for another position was interviewed in June and will begin work in July 2021.

Dr. Al-Agha oversees resident education. All members of the Department participate in teaching which has consisted in large part of one-on-one interaction focused on the cases the attending pathologist is responsible for the time in question. This includes cytopathology, for those attendings who practise it, and autopsies. The number of residents in the Department is variable, dependent on Saskatoon's scheduling, but not more than two at once and often none. COVID-19 has altered teaching formats by limiting the number of people in a shared space, and adaptation to this new reality is ongoing.

Dr. Angeles is the cytopathology lead and will oversee the implementation of liquid based gynecological cytology.

Dr. Woof is the co-lead (with Dr. Kinloch for Saskatoon) of the Anatomic Pathology Discipline Committee of the Saskatchewan Health Authority. Presenting a business case to obtain funding for a Province-wide digital pathology system (precipitated by the pandemic), development of a coordinated provincial quality assurance plan, and arranging for software to enable Level 6 synoptic reporting in Saskatoon (already available in SoftPath in Regina) are current objectives.

Dr. Alport will be resigning from Acting Laboratory Head for Regina at the end of September. A replacement has not yet been found.

#### Secretarial staff

Transcription and other secretarial functions are timely.

#### Physical space

Expansion of the grossing room at the Pasqua Hospital Laboratory to accommodate the increasing workload has been in the planning stage for a few years, but renovations are to begin shortly. This will also necessitate utilisation of a different room for immunoperoxidase staining. While the work is underway, the cryostat will need to be moved to another room, a minor inconvenience but one which addresses the issue introduced by the pandemic of physical distancing in what has been a shared space. Its long-term placement has not been settled.

#### Equipment

In a process coordinated with Saskatoon, vendors have been selected for two new immunoperoxidase staining machines, and installation is expected this fall to coincide with the renovations. A specimen tracking system is part of this contract and final negotiations are pending.

Three new grossing stations have been selected and had been slated for delivery this summer but this has been postponed due to COVID-19.

Funding has been obtained for a province-wide (Regina and Saskatoon are the only sites) liquid based cytology for gynecological cytology, and implementation is expected to begin in the fall.

### Software

The College of American Pathologist Cancer Reporting Protocols are incorporated into the laboratory information system (SoftPath) and periodic updates are introduced as they are made available.

conventional dictation with templates and secretarial transcription is used. Letters and documents other than surgical/cytology/autopsy reports also require conventional dictation and transcription. M-modal has never lived up to its promised capability; persistent errors, often in regularly failing to transcribe small words or transcribing words that have some phonetic similarity to those dictated but which are nonsensical, are an ongoing source of

M-Modal voice recognition software is utilised by most pathologists for most specimen reports, and by Pathology Assistants for large specimens. Its use for small specimens (e.g. biopsies) is too cumbersome and slow, and so for these (of which there are large numbers) frustration and which the system is incapable of learning from.

### Accreditation

Accreditation of the Pasqua and Regina General Hospitals by the College of American Pathologists has been achieved for more than 20 years, assessed on an ongoing basis with site inspections every two years. An inspection due this spring but was postponed because of the pandemic and is expected in the fall.

## **Hematology - Regina**

By Dr. Donna Ledingham

### Clinical Service

Semen analysis: New requisitions and patient booking process were rolled out in the summer of 2019. These were created in response to clinical feedback and the need for "load-leveling" for MLT staff. The new process has proved successful and is now restarted with the lifting of the COVID-19 restrictions.

Bone marrow biopsies: A new requisition and work standard was implemented in March 2020. This has streamlined and simplified the process for clinicians and pathologists alike. It has been used as a model for other Canadian institutions.

Coagulation testing: The use of the "DOAC Remove" neutralization agent was added to our coagulation screening and lupus anticoagulant testing in January 2020. Many thanks to our partners in Kingston for their generosity in sharing their method. D-Dimer reporting is being standardized provincially via the Hematology Discipline Committee. Work standards have been developed for validation of CBC and coagulation analyzers and rolled out for use provincially. A briefing note is being prepared for purchase of the new "Rapid TEG" (TEG 6S) viscoelastic coagulation testing instruments, to support management of bleeding surgical and trauma patients in Regina and Saskatoon. As we return to the "new normal", we hope to pursue a provincial utilization management project for ESR utilization. RFPs are planned for fall 2020 regarding both CBC and flow cytometry analyzers.

# Rural Laboratory Services

by Tammy Mason, Director, Rural



## Current Laboratory Services in the South

Saskatchewan's Rural (South) Laboratory Services essentially includes all facilities south of Saskatoon. There are 88 facilities with Laboratory Services provided at 3 regional hospitals, 5 district Hospitals, 28 community hospitals, 52 health centers. These laboratories provide testing in all the major clinical subspecialties including Biochemistry, Hematology, Transfusion Medicine and Point of Care – though not all subspecialties are provided at every site. Microbiology testing is performed in Moose Jaw and Yorkton, while Anatomical Pathology is located only in Moose Jaw. The scope of testing includes both primary and secondary testing while tertiary testing (genetic, molecular, and specialized) is referred to the major urban facilities in Regina and Saskatoon.

**Human Resources** The current designated number of pathologists within the South include 2.0 FTE's, both are in Moose Jaw. There are currently 269.41 FTE Allied Health Care Professionals in the Rural, including Medical Laboratory Technologists, Combined Laboratory and X-Ray Technologists, Medical Laboratory Assistants, Phlebotomists, Medical Office Assistants and Unit Clerks. 24.21 FTE are currently vacant and recruitment efforts to fill these "hard to recruit" positions are and have been underway for some time now.

**Medical Leadership** Leadership for Laboratory Medicine in the South is under the direction of the Director of Laboratory Medicine, South and operates as a dyad model (which has not been fully secured yet). The southern laboratories liaise, and are provided, with support from the clinical subspecialty experts through the Provincial Discipline Specific Committees (Biochemistry, Hematology, Transfusion Medicine, Microbiology, and Anatomical Pathology).

**Perceived obstacles (Gaps) and Potential Remedies**

- 1. Laboratory Information System (LIS) connectivity** Lack of Laboratory Information System (LIS) connectivity has become a major risk. In the South there are currently ten (10) 24-hour acute care facilities with no LIS connectivity and an additional four (4) acute sites that do not have coagulation interfaced. There are multiple health centers that are performing testing with either no LIS or have a depot location. This lack of connectivity puts an already vulnerable population at further risk. **Potential Remedy** LIS connectivity prioritization in progress. The acute care sites have been prioritized for LIS connectivity.
- 2. Aging Equipment and New Technology** As identified in the north report, there is an ongoing need to replace aging equipment and purchase new technology. Rural laboratories have had to rely heavily on local foundations to support equipment purchases. Oftentimes, there is no backup in even the larger rural centers, and this can

create problems when equipment goes down. In addition, service is not always immediate due to “higher priority” of urban sites, so oftentimes, equipment can be down for >24 hours, which leaves us at the mercy of the courier and transportation systems. **Potential Remedy** Coordinated planning and identification of risk on aging equipment and technology. Point of Care (testing at or near the patient location) options are available and will be an important consideration in future planning of clinical laboratory services. **3. Human Resources** Human Resources continue to be an ongoing challenge in rural. We are doing our best to encourage new hires to be located in the acute sites in an effort to maintain our 24-hour emergency facilities to remain staffed – but we cannot make someone work where they don't want to live or work. **Potential Remedy:** We have been working on a hub and spoke model to support rural facilities but coordination with unions can at times be somewhat challenging. Even though we are ‘one’ now, it is all but impossible to have staff ‘cross’ the union borders at times (whether it is different locals or entirely different unions – i.e. SEIU/CUPE).

**Success of Rural Team** Thus far, a huge success we have seen is that we are “one”, and as such, there is so much more collaboration with everyone. This includes staff, supervisors, managers, clinicians, and disciplinary support. The rural struggle with medical leadership is huge and having someone to call when we need medical oversight is very helpful. We have a long way to go, but we already feel the support and appreciate it very much.

**Challenges of Rural Team** One of the biggest challenges is the number of sites that perform testing. We have 52 health centers in the rural south in which 95% of them perform some level of testing. It is at times difficult to maintain competency for some staff when the testing volumes are low and the reporting method is either via paper, or manually entering into the LIS depot site. There are huge safety concerns with this challenge.

**Rural Living Rewards** These are huge! There is no greater reward than to live in the rural. We have experienced staff who are knowledgeable and proud of what they do and who know, on a personal level, the clients and residents they deal with on a daily basis. The personal connections are definitely higher in the rural because the same people we are connecting with during the day are the same people with whom we are playing hockey in the evening, or meeting at the grocery store. This puts more than just a number to the specimen – this gives us a reminder that there is a body – and more than likely someone we know – attached to that specimen.

**One Wish for Rural** A wish for the rural would be more standardization - in our processes, in our equipment, and in our testing menus. And with that, to have consistent support for everything that we do. While indicated above that the support has improved, we are by no means where we need to be. And oftentimes, the rural does not have the technical expertise needed to move some priorities forward nor have we had the opportunity to build trust relationships with leadership in urban. This will take time, and I do believe we have made huge strides. I look forward to continuing forward with the momentum we have gained thus far.



## Prince Albert

Prince Albert is the third-largest city in Saskatchewan. It is situated near the centre of the province on the banks of the North Saskatchewan River, in the White Fox Plain of the Saskatchewan River Lowlands. The city, located in a transition zone between aspen parkland and boreal forest biomes, is known as the 'Gateway to the North' as it is the last major centre on the route to the resources of Northern Saskatchewan. Prince Albert National park is located 51 K north of the city and contains a wealth of lakes, forest and wildlife.

The city and its inhabitants are served by Victoria Hospital located at 1200 24<sup>th</sup> St West. This is a regional hospital with a wide variety of specialized services including general surgery, internal medicine, orthopedics, pediatrics, obstetrics and gynecology, psychiatry and anesthesiology.

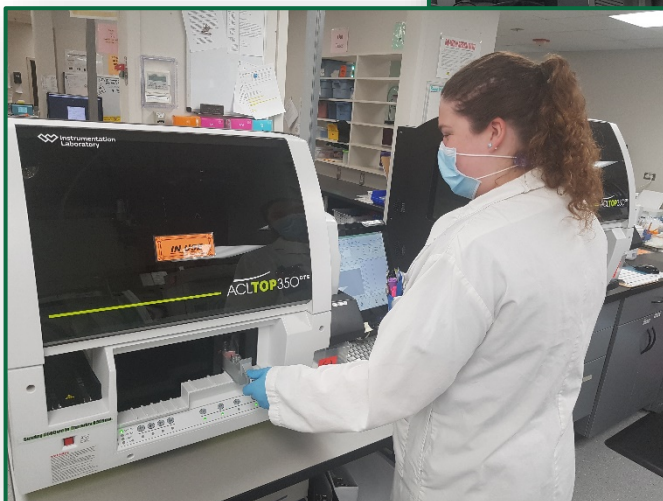
The Victoria Hospital Medical Laboratory provides services in Phlebotomy, Hematology, Coagulation Studies, Clinical Chemistry, Transfusion Medicine (a site of the PRAMS Program), Clinical Microbiology (a site of GeneXpert COVID-19 testing), Serology, Surgical Pathology and Cytology to in-patients, out patients and referred patients, and provides clinical training for the Medical Laboratory Assistant (MLA) and Combined Laboratory and X-Ray Technician (CXLT) Programs in partnership with Saskatchewan Polytechnique.

We are thankful to Edith Hein, Tech II in the Victoria Hospital Medical Laboratory, for documenting the daily work of staff dedicated to patient care. Provincial Laboratory Medicine offers its sincere thanks.



## Laboratory Staff at Victoria Hospital

*(Photo credits: Edith Hein, Tech II)*





# RESEARCH

## Endowment Funds by Dr. Fergall Magee

The Department now has access to nine different Endowment Funds:

*Dr. Thomas A. **Cunningham** Memorial Fund*  
*Maureen **Fuller** Memorial Lecture Fund*  
***Barbara Moore** Memorial Trust Fund*  
***D.F. Moore** Memorial Lecture Fund*  
*Mrs. J. **Olszewska** Neuropathology Fund*  
***SHR Pathologists** Fund in Medicine*  
*Dr. Rajendra K. **Sharma** Resident Research Award in Pathology*  
*Saskatchewan Association of Laboratory Medicine Award (**SALM**)*  
*Dr. Marc Omar **Shokeir** Memorial Fund*

Information concerning application dates and Terms of Reference of each fund is available on the Departmental webpage under "Endowment Funds / Apply for an Endowment".

(<https://medicine.usask.ca/department/clinical/pathology.php#Clinicaldivisions>)

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## Endowment Funds

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## Events

There are currently no upcoming events.

In the academic year of 2019-2020, the Endowment Committee allocated funding of \$31,390 to support 11 applications. Initiatives supported included funding to invite **guest lecturers** to the department . . .



(Dr. Judy Melinek, Forensic Pathologist and Forensic Pathology Expert Witness - supported by the Maureen Fuller Memorial Lecture Fund, Drs. Jason Karamchandani, Neuropathologist, McGill University and Maliha Khara, Neuropathologist and Forensic Pathologist, Queens University - both supported by the Mrs. J Olszwska Neuropathology Fund to present at the Olszewski Symposium, Dr. Sasan Zandi, Hematopathologist, University of Toronto supported by the Dr Thomas A. Cunningham Memorial Fund), **research initiatives** (Micro fractionated focused beam therapy in the treatment of brain tumors, supported by the Mrs. J. Olszewska Neuropathology Fund, a COVID-19 Biobank supported by the SHR Pathologists Fund in Medicine), **attendance at conferences** for undergraduate students, residents and technologists (supported by the Barbara Moore Memorial Trust Fund, D. F. Moore Memorial Lecture Fund, the Dr. Thomas Cunningham Memorial Fund, the Mrs. J. Olszewska Neuropathology Fund), and **publication costs of resident research** (supported by the Dr. Rajendra K. Sharma Resident Research Award in Pathology). While the COVID-19 Pandemic poses particular obstacles to hosting some of these initiatives, we continue to seek innovative solutions to support these planned events.

On behalf of the Department, I would like to acknowledge our deep appreciation of the generosity of all donors who continue to support our Department in this manner. I would

also like to thank Endowment Committee who continue to work so hard to honour the individual terms of reference of each endowment.

I would like to highlight during this past academic year, the Department has recently become the beneficiary of three additional Endowment Funds - the **Dr. Marc Omar Shokeir Memorial Fund**, the **Dr. Rajendra K. Sharma Research Award in Pathology** and the **Saskatchewan Association of Laboratory Medicine Fund**.

Sadly, as recorded in last year's Annual Report, Dr. Shokeir, a brilliant pathologist who had graduated from the College of Medicine at the University of Saskatchewan (1991), followed by a highly successful career involving practice in Vancouver, Bellingham, Red Deer, Calgary, Prince Albert and North Battleford, passed, all too soon, in 2019. This fund has been created to support initiatives in the Department of Pathology that honour the memory of Dr Shokeir. It will support an annual lecture series that promotes excellence in the medical expertise, collegiality, mentorship and connection, which are all values that Dr. Shokeir exemplified during his life. The lecture series will be entitled the 'Dr. Shokeir Memorial Lecture Series'. The fund may also be used to support pathology resident education activities.

The Rajendra K. Sharma Resident Research Award in Pathology is an award established by Dr Rajendara K.



Sharma and his family to encourage and facilitate research by residents in the Department. Dr Sharma is a long time member of the department who has made significant contributions to science in an extremely successful and internationally recognized research career in the fields of colorectal cancer and cardiovascular disease. He is still passionate about research that empowers society and wishes to nurture the next generation of scientific inquiry by encouraging future generations of residents in their first steps into research.

Finally, it gives me great pleasure to announce that the Saskatchewan Association of Laboratory Medicine will support an Award created to

provide funding for two or more Medical Laboratory Technologists (MLTs), Medical Laboratory Assistants (MLAs), or BSc's in the Lab to support their participation in local, national, international meetings and conferences. Other funding for MLTs/MLAs/BSc's educational opportunities may also be permissible at the discretion of the Endowment Fund Committee.

On behalf of the Department, I would like to acknowledge our deep appreciation of the generosity of all donors who continue to support our Department in this manner. I would also like to thank Endowment Committee who continue to work so hard to honour the individual terms of reference of each endowment.

### Endowment Funds Committee Membership

Dr. F. Magee (Chair)  
Dr. A. Saxena  
Dr. H. Wang

Dr. H. Deneer  
Dr. T. Banerjee  
Dr. D. Yu

Dr. K. Jafari  
Dr. J. Kalra  
David McKinnon

Harold Shiffman  
*Support Staff*

### Endowment Funds Committee Terms of Reference

#### PURPOSE:

- To manage, generally and financially, the dispersal and appropriate use of endowment funds designated to the Department of Pathology and Laboratory Medicine.
- To review and decide on initiatives and allocation of resources based on the Endowment Committee's recommendations and financial resources available.
- To develop and approve guidelines relating to the determination of value and conditions related to the initiatives being supported.
- To review the activity of each endowment fund and ensure that the intent and objectives of each fund is being met.

#### MEMBERSHIP:

- Department Head as Committee Chair
- Director of Laboratory Medicine (SHA)
- Residency Program Director

- One member of each division as appointed by the Department Head:
  - Anatomic Pathology
  - Hematopathology / Transfusion Medicine
  - Biochemistry
  - Microbiology
- Department Finance and Administration Manager
- One Senior Resident as appointed by the Residency Program Director
- One Support Staff as appointed by the Department Head

#### TERMS OF OFFICE:

- Each division member shall serve a two-year term which may be renewed.
- Resident members will serve a one-year term with possible reappointment for a second year.
- Members unable to complete their terms will be replaced by a new member from their division.
- Terms for Department Head, Residency Program Director, Director of Laboratory Medicine (SHA) and Finance and Administration Manager are unending.

#### QUORUM AND VOTING:

- Quorum will be five (5) members.
- Members of the Committee may not vote on motions related to their own submissions to the Endowment Committee.
- The Committee Chair will cast the deciding vote in the event of a tie.

#### ATTENDANCE AND MEETINGS:

- The Endowment Funds Committee will meet tri-annually in January, June and October.
- In addition to the established members of the committee, staff and external participants may be invited to attend on an ad-hoc basis for agenda items.

## Department Research Funding

While Pathology and Laboratory Medicine (PALM) has a long history of successful research traditionally, this has been limited to an academic minority. Our Department has some highly successful researchers with CIHR success but given that we are now a distributed, multidisciplinary system comprising over 60 clinicians and 1400 scientists of varying backgrounds, we have recognized the need to promote research capacity through our entire organization. Our ability to leverage this opportunity was greatly enhanced as a result of funding obtained from the Office of the Vice Dean of Research, for which we are extremely grateful. This funding was directed to applications that fostered a culture of multidisciplinary and distributed inquiry, displayed significant resident involvement and was directed towards vulnerable populations. A list of research projects that have been supported by this funding is included below.

In addition, some of this funding was directed to instituting a 'stand-alone' Department Research Day. A list of presentations and awards from this highly successful event is also included in this section.

## Department Research Fund Committee Membership

Dr. F. Magee (Chair)      David McKinnon      Harold Shiffman      Brandi Keller  
Dr. L. Quenneville      Dr. T. Banerjee      Dr. D. Ledingham      Dr. F. Wu

## Department Research Fund Terms of Reference

The Research Fund will provide “micro-financing” to spread research capacity throughout a distributed multidisciplinary system comprising clinicians and scientists across the province. When funding is available, the Department Research Committee will support research-related activities and be host to Departmental research days, encourage resident and laboratory staff involvement in research and enhance knowledge translation by fostering a culture of multidisciplinary and distributed inquiry.

### PURPOSE:

- To manage, generally and financially, the dispersal and appropriate use of research funds designated to the Department of Pathology and Laboratory Medicine
- To encourage broad and diverse research participation throughout the Department
- To promote innovative and interdisciplinary research in ways that will improve the health and well-being of the people of Saskatchewan and the world

### MEMBERSHIP:

- Department Head as Committee Chair
- Manager of Finance and Administration
- Residency Program Director
- One Resident (as chosen by the Chair)
- Up to two Lab Directors or Designates (as chosen by the Chair)
- Up to five other MD and/or PhD members of the department (as chosen by the Chair)

### TERMS OF OFFICE:

- This Committee is ad-hoc and will be called upon when discretionary research funding is available to the Department Head
- Member terms will end upon complete distribution of funding within a financial year
- Terms for Department Head, Residency Program Director and Finance and Administration Manager are unending

### QUORUM & VOTING:

- Quorum will be five (5) members
- Members of the Committee may not vote on motions related to their own submissions to the Committee
- The Committee Chair will cast the deciding vote in the event of a tie

### ATTENDANCE & MEETINGS:

- The Committee has no set meeting dates

- The Committee Chair will contact members and call meetings as required to properly distribute the funds
- In addition to the established members of the committee, staff and external participants may be invited to attend on an ad-hoc basis for agenda items

#### REPORTING PROCEDURES:

- The Committee will provide a report to the Office of the Vice-Dean of Research once per year. This report shall include:
  - Awarded disbursements for the previous period, including:
    - Principle Investigator(s) receiving funds
    - Amount awarded
    - Project Title
    - Brief Abstract

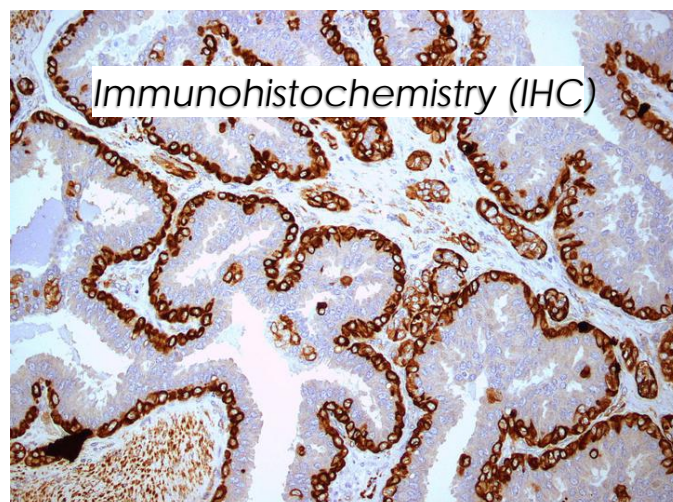
#### Funds dispersed 10 DEC 2019

Dr. P. Dokouhaki - \$5,190.00  
*Genetic polymorphisms in IgA Nephropathy*

Dr. M. Kinloch - \$3,039.99  
*Clinico-Pathologic correlation of hereditary endometrial carcinoma discovered by population-based tumor-based testing*

Dr. A. Kakadekar - \$5,050.00  
*Immunohistochemistry and TP53 Mutation profile in inflammatory and neoplastic vulvar lesions*

Dr. S. Tharmaradinam - \$8,050  
*Molecular profile in noninvasive and invasive extra ovarian low grade serous carcinoma*





# DEPARTMENT RESEARCH DAY



UNIVERSITY OF SASKATCHEWAN  
College of Medicine  
DEPARTMENT OF PATHOLOGY AND  
LABORATORY MEDICINE  
MEDICINE.USASK.CA

TUE, 26 NOV 2019  
RUH MALL THEATRE

## Presentations:

**A.M. Chair: Dr. Marilyn Kinloch**

### ➤ **Research Day Cmte – Comments**

Dr. P. Dokouhaki

### ➤ **Provincial Head – Comments**

Dr. J.F. Magee

### ➤ **UGME Student**

Daniel Markewich (Dr. J. Kalra)

### ➤ **Residents**

Dr. G. Wright

Dr. A. Andrews

Dr. H. Wang

Dr. D. Li

Dr. S. Tharmaradinam

Dr. A. Kakadekar

Dr. P. Price

### ➤ **Graduate Students**

Sukanya Pati (Dr. Dimmock/Dr. Sharma)

Chelsea Cunningham (Dr. Vizeacoumar)

Hanan Babekar (Dr. Uppalapati)

**P.M. Chair: Dr. Rani Kanthan**

### ➤ **V.D. Research – Comments**

Dr. M. Radomski

### ➤ **Faculty**

Dr. A. Radomska

Dr. E. McNair

Dr. A. Mostafa

Dr. M. Uppalapati

Dr. R. Sharma

Dr. E. Torlakovic

## Program:

**0730**

Breakfast

**0800**

Research Day Cmte.

Provincial Head

UGME/Resident/Grad

Student Presentations

**1000**

*Break/Refreshments*

**1015**

Presentations Continue

**1200**

*Lunch*

**1300**

OVDR Comments

Faculty Presentations

**1430**

*Break/Refreshments*

**1445**

Presentations Continue

**1530**

Award Presentations

*Judges:*

*Dr. D. Ravi*

*Dr. R. Kanthan*

*Heather Neufeld*

Daniel Markewich	Quality Assessment: Concordance and Discordance Between Clinical and Autopsy Diagnoses
Dr. G. Wright	Quality Assurance Evaluation of Drugs of Abuse Screen in Medical Evaluation for Secure Detox - A File Review
Dr. A. Andrews	Urine cytology ordering practices: A local perspective
Dr. H. Wang	Signet ring cell mesothelioma; A diagnostic challenge
Dr. D. Li	A Novel Microscopy Glare Reducing Neutral Density Filter for Cytopathology
Dr. S. Tharmaradinam	Serous borderline tumors, clinical pathological correlation – Saskatoon experience
Dr. A. Kakadekar	A Rare Case of Reticulated Acanthoma with Sebaceous Differentiation on a Male Areola
Dr. P. Price	CRISPR/Cas9-mediated Gene Editing in the Arginase-1-deficient Mouse Genome
Sukanya Pati	Evaluation of a potent cytotoxic designed to inhibit methionine aminopeptidase 2 with a view to treating colon cancer
Chelsea Cunningham	Synthetic Dosage Lethal Interactions of Polo-like Kinase 1 and their Application in Cancer Therapeutics
Hanan Babekar	Developing Small protein based affinity reagents targeting Ovarian Cancer biomarker MUC16(CA125)
Dr. A. Radomska	The Incidence of Gastric-type Endocervical Adenocarcinoma in Saskatoon Population - a Retrospective Study
Dr. E. McNair	Novel biomarkers of acute kidney injury following cardiac surgery
Dr. A. Mostafa	C3d complement as a predictable marker for antibody mediated rejection (AMR) of solid organ allografts
Dr. M. Uppalapati	Development of molecular imaging probes and theranostics targeting cancer biomarkers
Dr. R. Sharma	Basic Science at the Core
Dr. E. Torlakovic	1. "Interchangeability" of PD-L1 immunohistochemistry assays: a meta-analysis of diagnostic accuracy 2. Canadian Multicentre Project on Standardization of 22C3 immunohistochemistry Laboratory Developed Assay for Pembrolizumab Therapy of Non-Small Cell Lung Cancer 3. Estrogen and Progesterone Receptor Testing in Breast Cancer: ASCO/CAP Guideline Update

## Awards:

UGME	RESIDENTS	GRADUATE STUDENTS
D. Markewich \$150	G. Wright \$400 Best Sr. Resident	H. Babekar \$400
	S. Tharmaradnam \$200 Best Jr. Resident	S. Pati \$200
	P. Price \$100 Best Interdisciplinary	





## Nutrien Chair



Dr. Clarence (Ron) Geyer, a medical researcher in the Department of Pathology and Laboratory Medicine was named the Nutrien Chair in Clinical Research 02 OCT 2019 and will lead a 'cutting-edge' research program with the potential to transform cancer care. This five-year research program is funded by a \$600,000 partnered investment initiated by \$500,000 from the Royal University Hospital Foundation's Nutrien Endowment and \$100,000 from the College of Medicine's Vice-Dean of Research. The program is part of the USask-led Advanced Diagnostic Research Laboratory (ADRL), a collaboration of the Saskatchewan Health Authority, College of Medicine and Saskatchewan Cancer Agency.

Dr. Geyer is Co-Director of ADRL, and member of the Translational Cancer Research Cluster and the Centre for Biologic Imaging Research and Development (C-BIRD)-established in 2014 by Dr. Geyer and colleagues Drs. Humphrey Fonge and Paul Babyn. This team collaborates with

Pathology professor Dr. Ron Geyer (PhD) was named the Nutrien Chair in Clinical Research for a five-year term starting OCT 2019.

the U of S Saskatchewan Centre for Cyclotron Sciences, managed by the Fedoruk Centre, to develop the next generation of molecular imaging agents for cancer diagnostics.

As Nutrien Chair, Dr. Geyer's research will focus on developing and validating novel antibody-based imaging probes for clinical applications in molecular diagnostics, surgery and immunotherapy. Support from the Nutrien Chair is enabling Dr. Geyer's research team to develop: (i) a positron emission tomography (PET) imaging probe for diagnosing and monitoring cancers, (ii) an optical imaging probe that will assist surgeons in the resection of tumors and (iii) engineered immune cells that target and destroy cancer cells. In the upcoming year, Dr. Geyer intends to translate his basic research in PET imaging and image-guided surgery to clinical practice, and also hopes to complete two Phase I/II clinical trials. The first of these is to validate a PET imaging probe to detect lung and colorectal cancers, while the second will validate an optical imaging probe that enables more detailed assessment of tumor extent (lung cancer), allowing for more accurate resection. Dr. Geyer



and his team are also working on a novel strategy to target cells to specific cancer and improve patient outcomes. They hope to complete the preclinical validation of this immunotherapy in the coming year.

Dr. Geyer and colleagues provide a valuable resource for the clinical research community in the translation of research ideas from bench to bedside. his research is at the forefront of the burgeoning field of precision medicine, where therapies and monitoring strategies are customized to individual patients.

On behalf of the Department, may I extend congratulations to Dr Geyer and his team and wish them all future success.

I would also like to commend Nutrien for its leadership and innovative thinking in supporting this clinical research chair, and express sincere thanks to Vice Dean Radomski and the Royal University Hospital Foundation for their on-going support.

*Dr. Fergall Magee, Provincial Head*



(l-r) Chuck Magro, Nutrien President and CEO; Dr. Karen Chad, VP of Research, University of Saskatchewan; Dr. Ron Geyer, Nutrien Chair; Dr. Paul Babyn, inaugural Nutrien Chair and Physician Executive SHA Provincial Programs; Arla Gustafson, RUH Foundation CEO; Dr. Preston Smith, Dean of Medicine, University of Saskatchewan

# Customized binding proteins for applications in drug discovery and molecular imaging

## Dr. Maruti Uppalapati

Department of Pathology and Laboratory Medicine  
College of Medicine | University of Saskatchewan  
Office: 4D01.15 Health Sciences Building  
Email: [maruti.uppalapati@usask.ca](mailto:maruti.uppalapati@usask.ca)



I started as principal investigator in summer 2015 and my laboratory is located in 2D10 Health Sciences Building. We are a protein engineering laboratory focused on developing antibody and alternative protein binders to disease markers of interest.

### What is the significance of our work?

The human genome encodes genes for nearly 20,000 different proteins. Proteins mediate cellular functions through a network of interactions and their activity is tightly regulated to maintain balance. Aberrant protein activity due to mutation, overexpression or knockdown of certain proteins, leads to imbalance and reorganization of protein networks and is the hallmark of diseases such as cancer. The ability to identify and monitor these molecular signatures/biomarkers of disease is essential for prognosis, diagnosis, treatment and monitoring of disease progression.

### What are the applications?

Affinity reagents, such as antibodies, that bind to protein biomarkers of disease are essential tools for molecular diagnosis. Monoclonal antibodies can recognize biomarkers expressed on the cancer cell surface and can be used to disrupt protein function or act as carriers to deliver lethal doses of drugs/radiation to the site of tumor. In a theranostics approach, the same antibodies can be labeled with infrared dyes/radioisotopes to decorate the tumor and enable applications in image-guided surgery and non-invasive PET/SPECT imaging of patient tumors.

### How do we make custom human-origin antibodies and binding proteins?

We use phage-display, a combinatorial protein engineering technique, to generate affinity reagents that bind specifically to the target protein of interest. Here the gene of a human-origin scaffold protein (such as Fab fragment of antibody or a protein domain) is fused to the gene of a bacteriophage coat protein. These bacteriophages then express the scaffold protein on its surface, while also packaging the gene encoding the fusion protein as single-stranded DNA within the viral particles.

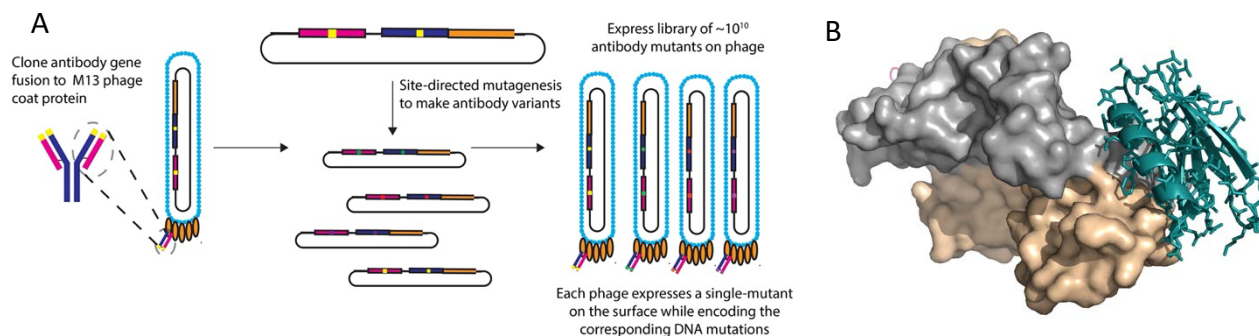


Figure 1. A: Schematic of phage-displayed antibody library. B: A protein binder (teal) generated against vascular endothelial growth factor A (dimer shown in grey and wheat)

Using site-directed mutagenesis or cloning of diverse antibody repertoires, a large library of scaffold protein mutants ( $\sim 10^{10}$ ) can be displayed on the phage surface with each phage particle encoding and expressing a single variant of the displayed protein. Each folded variant in the library represents a *de novo* interaction surface that can potentially form a complex with the target protein, given structural and biochemical complementarity can be achieved. Using a phage-displayed combinatorial library, billions of variations of the *de novo* interfaces can be screened, and the process often results in generating optimal variants that interact with high affinity and specificity to target protein of interest.

## Progress

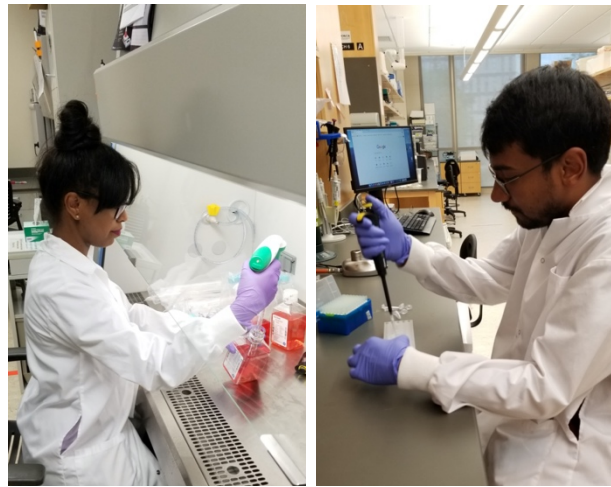
In the past 5 years, we have developed methods and proprietary affinity reagent development platforms for generation of human-origin monoclonal antibodies and binding-protein domains. We have utilized these platforms to generate both antibody and protein-domain based reagents to several cancer biomarkers, including Nectin-4, MUC16 and IGF2R. The reagents generated in our lab, can potentially be used for detection and treatment of several cancers including triple-negative breast cancer (TNBC), pancreatic cancer and ovarian cancer. We are currently working with collaborators with expertise in nuclear medicine to translate the reagents developed in our laboratory for applications in molecular imaging and targeted radioimmunotherapy of cancers.

## Acknowledgements

We are thankful for funding from College of Medicine, University of Saskatchewan, Saskatchewan Health Research Foundation (SHRF), Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council of Canada (NSERC) that supported this work.

This work has helped us recruit and train several undergraduate (Hassan Yassin, Jaline Broqueza, Samitha Andrahennadi, Sadullah Saba) and graduate students (Hanan Babeker, Chandrabose Prabhakaran, Jaline Broqueza) and postdoctoral fellows (Arun Kumar Annan-Sudarsan, Vellalore Maruthachalam Bharathikumar). I am thankful for their contributions in establishing our laboratory.

We are always looking for potential trainees, please contact me if interested.



Trainees, Hanan Babeker and Chandrabose Prabhakaran, conducting experiments in the lab





# Celebrating Sharma's record of research



## Professor Dr. Rajendra Sharma (PhD, DSc)

By **KISTEN MCEWEN** (photo and article reprinted with permission) 12 JUL 2019 "CoM News"

When University of Saskatchewan (USask) researcher Dr. Rajendra Sharma (PhD, DSc) received the [Saskatchewan Order of Merit in 2004](#), he thought back to one of the biggest supporters in his scientific career: his father.

While Sharma was growing up in small town in India, his father would read in newspapers about the discoveries that scientists were making around the world. He wanted his son to be one of them. "He would say, 'You have to become a scientist,'" Sharma said.

His father's wishes came true. Sharma went on to complete his PhD in biochemistry at the All India Institute of Medical Sciences in New Delhi, and later moved to Boston, Mass., for a post-doctoral fellowship at Tufts University.

In 1976, he moved to Canada—first to Winnipeg and then to Calgary. Sharma was then hired at USask in 1991 to rejuvenate basic science research within the College of Medicine's Department of Pathology and Laboratory Medicine.

Throughout his career, Sharma's lab has purified and characterized more than two dozen proteins from various species. Through the purification process, he discovered close to a dozen new activator and inhibitor proteins and established their biological and physiological functions.

The distinguished professor continues to excel in the field of cutting-edge colorectal cancer research, among other areas.

In 1995, Sharma and his team discovered that a protein enzyme labelled N-myristoyltransferase (NMT) is active and present in cancerous colon tissues, and appears in the early stages of colorectal cancer, which has a high mortality rate worldwide.

"My idea was to identify a marker for the early detection of cancer. We can save lots of people from undergoing a colonoscopy, that is expensive and painful," Sharma said.

While there is no replacement for the procedure, Sharma and his team created a way to use the enzyme as a marker to see if colorectal cancer is present. This test has been licensed and is currently being developed at Bertech Pharma Ltd., an Edmonton company that is conducting clinical trials.

**"My father used to say that it takes too much time to gain wisdom, but it takes such little time to share knowledge."**

— Dr. Rajendra Sharma

When it comes to research, collaboration is key, Sharma said. He has developed ties with numerous colleagues and researchers around the world, to make milestone discoveries.

"My father used to say that it takes too much time to gain wisdom, but it takes such little time to share knowledge," he added.

Now 77, Sharma is currently serving as editor-in-chief for the *Journal of Molecular Biology and Therapeutics*. He has gained expertise in the world of scientific journals, publishing nearly 250 full-length papers and 154 national and international abstracts.

Four decades of his research have also been summarized in three review articles, one of which has been published in the journal *Cell Calcium* (2018), and the other two published recently in the *Journal of Molecular Biology and Therapeutics*.

Sharma acknowledges the contributions and dedication of post-doctoral fellows, research assistants, graduate students and summer students in his laboratory.

When he does decide to finally step away from research, Sharma said he plans to spend time with his wife, his three daughters and their families. He would like to pass on the spark of research and the love of learning to future generations and he also wants to take up volunteer work, visiting hospitals as well as long-term care centres which may not often receive visitors.

Sharma is very proud of his Indian roots and heritage and still makes visits to his hometown overseas.

"I'm very thankful to my colleagues at the College of Medicine who have supported me in my endeavours," he said. "I wouldn't be where I am today if it were not for my family."

# Presentations, Publications, Grants & Awards

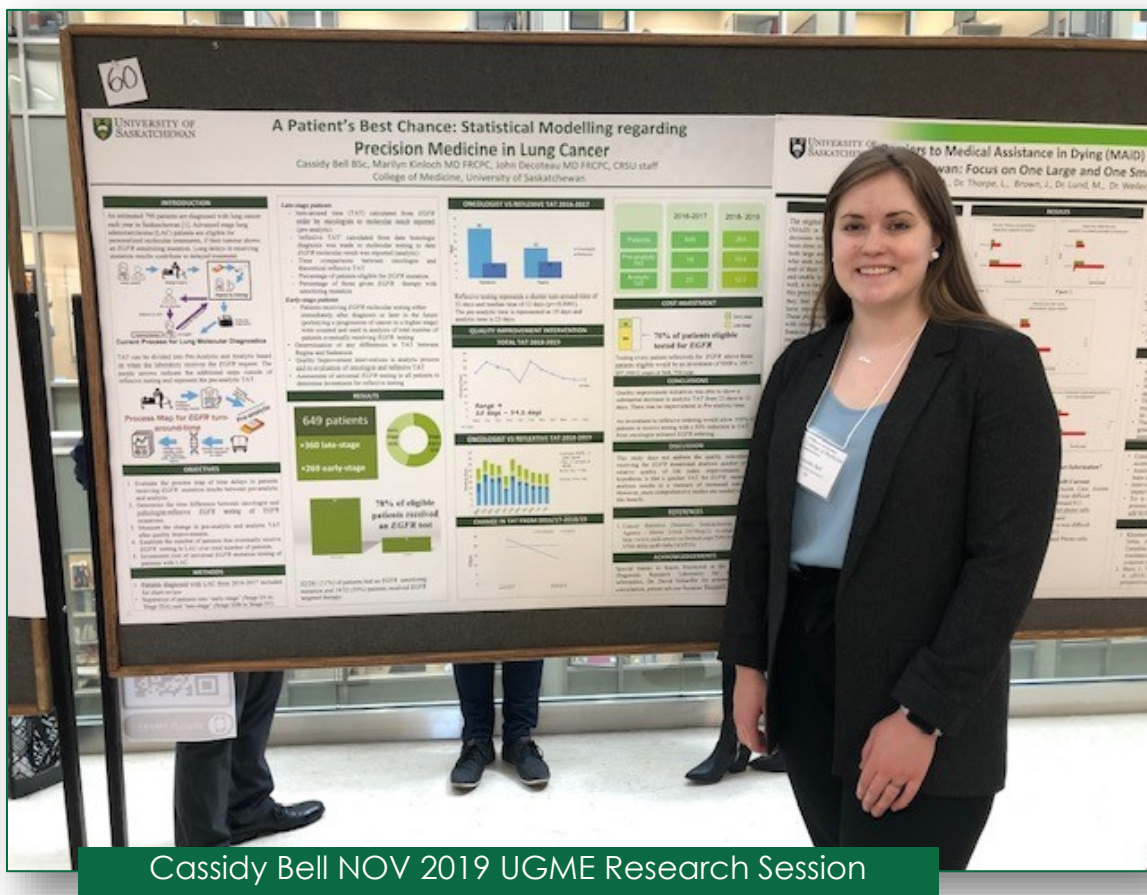
## Undergraduate Medical Education Students

### Daniel Markewich

Recognizing his dedication to research, Daniel Markewich, a student under the supervision of **Dr. Jay Kalra**, was selected for a *College of Medicine MD Excellence in Research Award*, presented 17 OCT 2019.

### Cassidy Bell

Supervised by **Drs. M. Kinloch** and **J. DeCoteau**, Cassidy Bell won first place in the 21 NOV 2019 UGME Research Session in the category of quality and safety.



## Graduate Students

### Stephanie Vuong

Supervised by **Dr. A. Lyon**, Stephanie was awarded the 2019-2020 Gordon McKay Graduate Student Travel Award in Analytical Chemistry, College of Pharmacy and Nutrition, U of S. \$1,000. MAR 2020.

### Sukanya Pati

Supervised by **Dr. Rajendra Sharma**, Sukanya was awarded the **Frist Place - Poster Prize Award** at the Three Rs & Animal Research Symposium, University of Saskatoon, SK, Canada, October 18, 2019

Sukanya Pati was awarded **Second Place - Oral Presentation Award** - at Research Day, Department of Pathology & Laboratory Medicine, College of Medicine, University of Saskatchewan, Saskatoon, SK, Canada, November 26, 2019

## Staff

### Heather Neufeld

As part of Safety and Health week (11 MAY 2020), University Safety Resources took the opportunity to celebrate those in the USask community who go above and beyond to keep our students, staff and faculty safe. This included USask's annual **Safety Recognition Award** which was given to the Health Sciences lab managers for their outstanding work over the past year. Lab managers are crucial to the safety and operations within their colleges and units. This year, the Health Sciences lab managers, including our own **Heather Neufeld** (Laboratory Manager for the 2D10 and 2D40 Health Sciences Laboratories in the Council of Health Sciences Deans Office), were recognized as influencers who affect all levels of research and help exemplify that research can be both productive and safe, especially with the unique circumstances of COVID-19.







### Harold Shiffman

Our Finance and Administration Manager, Harold Shiffman, earned his Master's Degree in Business Administration NOV 2019.

## Faculty

### Dr. Joseph Blondeau

*I would like you to join us in expressing congratulations to Dr. Joe Blondeau, Clinical Microbiology Division Head.*

*Dr. Blondeau was a member of an international group of content experts assembled to develop guidelines on the treatment of infectious diseases in companion animals (dogs and cats). These guidelines are modelled after guidelines published for human infectious diseases. The document, Urinary Tract Infection - guidelines for dogs and cats, was published in The Veterinary Journal (2019) and, as a result of the number of downloads, the article has just been awarded the "**George Fleming Prize**" for the "meritorious published" article of 2019.*

*Well done Dr. Blondeau!*

A handwritten signature in black ink that reads "Dr. J. Fergall Magee". The signature is stylized and cursive.

Dr. J. Fergall Magee  
Provincial Head

### Dr. Rajni Chibbar

#### Award

2019 College of Medicine Research Award (CoMRAD) Atrophy/Proliferative inflammatory atrophy (PIA) of the prostate-the bona fide precursor of prostate cancer - \$30,000

## Dr. John DeCoteau

### **Refereed Journal Publications (Career total: 56)**

Baniak N, Gilks CB, DeCoteau J, Kinloch M. Diagnostic Variation in p53 Usage for Endometrial Carcinoma Diagnosis: Implications for Molecular Subtyping. *Int J Gynecol Pathol*. 2019 Sep 27 [Epub ahead of print]

Pastushok L, Fu Y, Lin L, Luo Y, DeCoteau JF, Lee K, Geyer CR. A Novel Cell-Penetrating Antibody Fragment Inhibits the DNA Repair Protein RAD51. *Sci Rep*, 2019 Aug 2;9(1):11227

Barreto K, Maruthachalam BV, Hill W, Hogan D, Sutherland AR, Kusalik A, Fonge H, DeCoteau JF, Geyer CR. Next-generation sequencing-guided identification and reconstruction of antibody CDR combinations from phage selection outputs. *Nucleic Acids Res*, 2019 May 21;47(9):e50

Baniak N, Fadare O, Köbel M, DeCoteau J, Parkash V, Hecht JL, Hanley KZ, Gwin K, Zheng W, Quick CM, Jarboe EA, Liang SX, Kinloch M. Targeted Molecular and Immunohistochemical Analyses of Endometrial Clear Cell Carcinoma Show that POLE Mutations and DNA Mismatch Repair Protein Deficiencies Are Uncommon. *Am J Surg Pathol*, 2019 Apr;43(4):531-537

Toosi BM, El Zawily A, Truitt L, Shannon M, Allonby O, Babu M, DeCoteau J, Mousseau D, Ali M, Freywald T, Gall A, Vizeacoumar FS, Kirzinger MW, Geyer CR, Anderson DH, Kim T, Welm AL, Siegel P, Vizeacoumar FJ, Kusalik A, Freywald A. EPHB6 augments both development and drug sensitivity of triple-negative breast cancer tumours. *Oncogene*, 37:4073-4093

Chekol R, Solomon VR, Alizadeh E, Bernhard W, Fisher D, Hill W, Barreto K, DeCoteau JF, Parada AC, Geyer CR, Fonge H. (Ch89)Zr-nimotuzumab for immunoPET imaging of epidermal growth factor receptor. *Oncotarget*, 2018 9:17117-17132

Alam MK, Alhhazmi A, DeCoteau JF, Luo Y, Geyer CR. RecA Inhibitors Potentiate Antibiotic Activity and Block Evolution of Antibiotic Resistance. *Cell Chem Biol* 2016 Mar 17;23(3):381-391

Yang Y, Sebra R, Pullman BS, Qiao W, Peter I, Desnick RJ, Geyer CR, DeCoteau JF, Scott SA. Quantitative and multiplexed DNA methylation analysis using long-read single-molecule real-time bisulfite sequencing (SMRT-BS). *BMC Genomics*, 2015 16:350-362

### **Refereed Conference Publications (Career total: 55)**

Baniak N, Fadare O, DeCoteau J, Kobel M, Parkash V, Hecht J, Hanley K, Gwin K, Zheng W, Quick C, Jarboe E, Liang S, Kinloch M. POLE Mutations in Clear Cell Endometrial Carcinoma (abs#1135). *Modern Pathology* 2018; 31 (suppl 2): page# 406

Baniak N, Gilks B, DeCoteau J, McAlpine JN, Kobel M, Singh N, Casey L, Ganesan R, Kinloch M. Molecular Characterization of Recurrent Low Grade, Low-Stage Endometrioid Endometrial Carcinoma (abs#1136). Modern Pathology 2018; 31 (suppl 2): page# 406

## Dr. Harry Deneer

### Publications

1. Blondeau LD, Rubin J, **Deneer H**, Kanthan R, Morrison B, Sanche S, Rypien C, Dueck D, Beck G, Blondeau J. Persistent infection with Staphylococcus pseudintermedius in an adult oncology patient with transmission from a family dog. J. Chemother. 2020 Vol. 32 (3): 151-155. DOI: 10.1080/1120009X.2020.1735142
2. Alsaeed, Wright G, **Deneer H**, Rubin J, Sanche, S J. Blondeau. Methicillin resistant Staphylococcus aureus replication in the presence of high drug concentrations of vancomycin as seen by electron microscopy. J. Chemother. 2020 Vol. 32 (4): 179-187. DOI: 10.1080/1120009X.2020.1761191
3. Blondeau LD, Rubin J, **Deneer H**, Kanthan R, Sanche S, Hamula C, Blondeau J. Forensic, investigative, and diagnostic microbiology: similar technologies but different priorities. Future Microbiology 2019 Vol. 14 (7), 553-558

## Dr. Andrew Freywald

### Publications

1. Banding Together: A Systematic Comparison of The Cancer Genome Atlas and the Mitelman Databases. Denomy C, Germain S, Haave B, Vizeacoumar FS, **Freywald A**, Weaver BA, Vizeacoumar FJ. Cancer Res. 2019 Oct 15;79(20):5181-5190. Epub 2019 Aug 15.

### Grants Received

2020/2 – 2023/1

Principal Applicant

Targeting EphB6-deficiency in breast cancer

Funding Sources:

University of Saskatchewan College of Medicine

Bridge funding

Total Funding - \$100,000

Funding Competitive?: Yes

2020/1 – 2021/12

Co-investigator

Prairie Cancer Research Consortium projects (Saskatchewan Section)

Funding Sources:

Terry Fox Research Institute (TFRI)

TFRI – Marathon of Hope Cancer Centres Network Pilots  
Total Funding - \$600,000 (\$120,000 was directly available to my team, 25% blanket cut was applied to the whole grant due to COVID-19-related complications).  
Funding Competitive?: Yes

### Dr. Sheila Harding

#### Provincial

**Ledingham D, van Vliet P, Harding S.** Province-wide implementation of tools and processes for blood request screening to ensure alignment with best practices and improve stewardship.

**Blais E, Lett R, Harding SR** (2020 April 29). *Clinical Practice Recommendations for Requesting Pre-Transfusion ("Type and Screen") Testing for Adult Elective Surgical Patients – Saskatchewan*. (Released while still under stakeholder review, to assisted with pandemic service resumption planning.)

### Dr. Kathy Jafari

Violidaki D, Axler O, **Jafari K**, et al. Analysis of erythroid maturation in the nonlysed bone marrow with help of radar plots facilitates detection of flow cytometric aberrations in myelodysplastic syndromes [published online ahead of print, 2020 Jun 16]. *Cytometry B Clin Cytom*. 2020;10.1002/cyto.b.21931. doi:10.1002/cyto.b.21931

### Dr. Jay Kalra

#### BOOKS AND CHAPTERS IN BOOKS

##### **Edited Books – Accepted/Published**

Lightner, N. J., **Kalra, J.**, (Ed.) (2019). *Advances in Human Factors and Ergonomics in Healthcare and Medical Devices*. Springer Nature Switzerland AG 2020. Washington D.C., USA.

##### **Chapters in Books – Accepted/Published**

**Kalra J.**, Baniak-Campos G., Saxena A., & Rafid-Hamed Z. (2019). Medical Error Disclosure – A Canadian Perspective in Improving Quality of Health Care. In: Lightner N. and Kalra J. (Ed.) *Advances in Human Factors and Ergonomics in Health Care and Medical Devices*. Springer Cham, p 26-34.  
(Contribution 70% JK- Literature review, summarizing the data, writing of manuscript, senior and corresponding author, and other author's are students)

**Kalra J.**, Markewich D., & Seitzinger P. (2019). Quality Assessment and Management: An Overview of Concordance and Discordance Rates Between Clinical and Autopsy Diagnosis. In: Lightner N. and Kalra J. (Ed.) *Advances in Human Factors and Ergonomics*



*in Health Care and Medical Devices*. Springer Cham, p 45-54.

(Contribution 70% JK- Literature review, summarizing the data, writing of manuscript, senior and corresponding author, and other author's are students)

**Kalra J., Rafid-Hamed Z., & Seitzinger P. (2019).** Alterations in Thyroid Function Testing with Aging. In: Lightner N. and Kalra J. (Ed.) *Advances in Human Factors and Ergonomics in Health Care and Medical Devices*. Springer Cham, p 261-269.

(Contribution 75% JK- Literature review, summarizing the data, writing of manuscript, senior and corresponding author, and other author's are students)

#### PAPERS IN REFEREED JOURNALS – ACCEPTED/PUBLISHED

##### **PUBLISHED**

**Kalra J., Rafid Hamed Z., & Seitzinger P. (2019).** The Future of Diagnostic Laboratory Testing in Healthcare. *Am J Biomed Sci & Res*, 5(2): 89-91.

(Contribution 70% JK- Literature review, summarizing the data, writing of manuscript, senior and corresponding author, and other author's are students)

#### PRESENTATIONS

##### **Invited Presentations**

**Kalra J. (March 2020).** Medical Error and Disclosure – A Best Practice Model for Error Disclosure. All India Institute of Medical Sciences. New Delhi, India. March 4, 2020

*Dr. Kalra with Dr. Prakash, Dr. Datta, and other faculty/Post graduate residents at the Department of Laboratory Medicine, All India Institute of Medical Sciences. New Delhi, India.*



*Dr. Kalra with Dr. Datta and other faculty members at the Department of Laboratory Medicine, All India Institute of Medical Sciences, New Delhi, India.*

**Kalra J.** (February 2020). Quality Management and Assessment: Concordance and Discordance Rates between Clinical and Post-Mortem Diagnoses. 9<sup>th</sup> International Conference of Indian Academy of Biomedical Science. Kolhapur, Maharashtra, India. February 27, 2020

**Kalra J.** (February 2020). Medical Error Disclosure: A Global View. D.Y. Patil Medical College, Kasaba Bawada, Kolhapur, Maharashtra, India. February 26, 2020



From left to right: Dr. Abhishek Das (PG Student), Dr. Seema More (Department Head), Dr. Jay Kalra, Dr. R S Patil (Associate Professor), Dr. V D Dafle (Assistant Professor). Department of Pathology. D.Y. Patil Medical College, Kasaba Bawada, Kolhapur, Maharashtra, India



Dr. Kalra visiting with Dean Sharma (Far Right) and other members of the Department of Pathology at the D.Y. Patil Medical College, Kasaba Bawada, Kolhapur, Maharashtra, India



Dr. Kalra with the Department of Pathology at the D.Y. Patil Medical College, Kasaba Bawada, Kolhapur, Maharashtra, India

**Kalra J.** (November 2019). Medical Error and Disclosure – An Ethical Dilemma. Annual Conference and International Symposium of Indian Society for Atherosclerosis and Research. Lady Hardinge Medical College. Delhi, India. November 9, 2019

#### Contributed Presentations

Markewich D., Seitzinger P., & **Kalra J.** (November 2019). Quality Assessment: Concordance and Discordance Between Clinical and Autopsy Diagnoses. Department of Pathology and Lab Medicine Research Day. Saskatoon, Saskatchewan. November 26, 2019.

**Kalra J.**, Baniak-Campos MG., Saxena A., & Rafid-Hamed Z. (July 2019). Medical Error Disclosure – A Canadian Perspective in Improving Quality of Health Care. International Conference on Advances in Intelligent Systems and Computing. Advances in Human Factors and Ergonomics in Health Care and Medical Devices (AHFE). Washington, DC, USA. July 28, 2019.

**Kalra J.**, Markewich D., & Seitzinger P. (July 2019). Quality Assessment and Management: An Overview of Concordance and Discordance Rates Between Clinical and Autopsy Diagnosis. International Conference on Advances in Intelligent Systems and Computing. Advances in Human Factors and Ergonomics in Health Care and Medical Devices (AHFE). Washington, DC, USA, July 28, 2019.

**Kalra J.**, Rafid-Hamed Z., & Seitzinger P. (July 2019). Alterations in Thyroid Function Testing with Aging. International Conference on Advances in Intelligent Systems and Computing. Advances in Human Factors and Ergonomics in Health Care and Medical Devices (AHFE). Washington, DC, USA. July 27, 2019.

#### Poster Presentations

Markewich D., & **Kalra J.** (November 2019). Quality Assessment: Trends in Medical Error Management. College of Medicine Undergraduate Research Day. Saskatoon, SK. November 21, 2019.

#### ADMINISTRATIVE SERVICE

##### **University Committees**

Member- Executive Committee; College of Graduate and Postdoctoral Studies 2019-20

Member (Elected) Board of Governors, University of Saskatchewan 2019-20

Committee Member Elected-at Large, University Council, University of Saskatchewan, 2019-20

## College and Departmental Committees

Chair, Nominations Committee, Faculty Council, College of Medicine, 2019-20

Committee Member, Bylaws Committee, College of Medicine, 2019-20

Committee Member, Faculty Council, College of Medicine, 2019-20

Committee Member, Endowment / Trust Funds Committee, Department of Pathology, 2019-20

Coordinator, Undergraduate Teaching Program Committee, Department of Pathology, 2019-20

Committee Member, Faculty Association Representative Committee (FAR's), (Departmental Representative), 2019-20

## Other Administrative Service

Member research committee, Global outreach Medical and health Association (GOMHA) –Non-Profit Organization Registered, Government of India. 2019-20

Member Research Advisory committee. The Nan Yang Academy of Sciences (NAS). The focus of the NAS is to promote a platform for the exchange academic achievements by gathering global scientific institutes, experts and scholars in various fields. Singapore. 2019-20

## PROFESSIONAL OR ASSOCIATION OFFICES AND COMMITTEE ACTIVITIES OUTSIDE U OF S

Lead, **Kalra J.** Canadian Association of Health Sciences (CAHS) Regional Network, 2019-20

Chair, Audit Finance and Risk Committee, Council of Canadian Academies. 2019-20

Member, Board of Governors/Directors, Council of Canadian Academies (CCA), 2019-20

Vice-President, Saskatchewan Society of Clinical Chemist (SSCC), 2019-20

Vice-Chair, American Society for Quality (ASQ), Saskatchewan Section, 2019-20

Chair, Second International Conference on Human Factors in Aging and Gerontology (HFAGE) – conference track, Applied Human Factors and Ergonomics (AHFE), USA, 2019-20

Committee Member, Human Factors and Ergonomics in Healthcare Scientific Advisory Board, Applied Human Factors and Ergonomics (AHFE), USA, 2019-20



## Dr. Rani Kanthan

### Publications

#### a) CHAPTERS IN BOOKS (Two chapters)

2020 Third Edition – Handbook of Pathology for Post Graduate Students  
Invited Contributor-Chapter 6 Lesions of the Lung pages 67-83  
Chapter20: Endocrine Pathology pages245-258  
CBS Publishers & Distributors ISBN978-93-89688-61-0

#### b) PAPERS IN REFEREED JOURNALS – Total of 5 papers

- 1) L.D. Blondeau, J.E. Rubin, H. Deneer, **R. Kanthan**, B. Morrison, S. Sanche, C Beshard N, Mpofu C & J.M. Blondeau (2020). Bacteremia with *Staphylococcus pseudintermedius* in a 4 month old pediatric oncology patient. Journal of Chemotherapy DOI: 10.1080/1120009X.2020.1773627

***I am a co-author for this study based on the Masters Project work by Leah Blondeau***

- 2) L.D. Blondeau, J.E. Rubin, H. Deneer, **R. Kanthan**, B. Morrison, S. Sanche, C. Rypien, D. Dueck, G. Beck & J.M. Blondeau (2020) Persistent infection with *Staphylococcus pseudointermedius* in an adult oncology patient with transmission from a family dog, Journal of Chemotherapy, 32:3, 151-155, DOI: 10.1080/1120009X.2020.1735142

***I am a co-author for this study based on the Masters Project work by Leah Blondeau***

- 3) S. Tharmaradinam, S. Kanthan, **R. Kanthan** (2020). Pneumatosis cystoides intestinalis and hyperganglioneosis – Cause or effect? A review. Pathology Research and Practice Pathology – Research and Practice 216 (2020) 152879

***I am the senior author with S. Kanthan, surgeon and S.Tharmaradinam, senior pathology resident as co-authors***

- 4) Wang H, **Kanthan R** [2019] Multiple colonic and ileal perforations due to unsuspected intestinal amoebiasis-Case report and review. Pathol Res Pract. 2019 Aug 19;152608. Doi: 10.1016/j.prp.2019.152608. [Epub ahead of print]

***I am the senior author with Wang H senior pathology resident as co-author***

- 5) Chibbar R, **Kanthan R** [2019] Dysplasia in Inflammatory Bowel Disease: A journey from the Past to the Present (2019): A review. EC Gastroenterology and Digestive System Review article 2019; 6:10; 874-890

***I am the senior author with Richa Chibbar as first author for this invited review***

#### c) REFERRED PEER REVIEWED CONFERENCE PUBLICATIONS -Total of six (6)

- 1) **Kanthan R** (2020). Thyroid Lesions in the Pediatric Age Group. 04<sup>th</sup> International Pediatrics and Perinatal Conference, Feb 05<sup>th</sup> -08<sup>th</sup>, Chennai, India

*This was delivered as an invited oral presentation*

- 2) Saxena A and **Kanthan R (2020)**. Leadership for Inclusivity and Cultural appropriateness 17<sup>th</sup> Asia Pacific Medical Education Conference Pre conference workshop **08<sup>th</sup> Jan 2020** Singapore  
*This was an interactive 4 hour teaching workshop for 35-40 registered participants*
- 3) **Kanthan R.(2020)**. Curriculum mapping in Post Graduate Medical Education. 17<sup>th</sup> Asia Pacific Medical Education Conference **10<sup>th</sup> Jan 2020**, Singapore  
*This was delivered as an oral presentation in the designated category*
- 4) Kanthan R Mixed tumors of the colon and rectum: A review 2<sup>nd</sup> World Congress of Surgeons, **Nov 11-12 , 2019**, Istanbul, Turkey  
*This was delivered as an invited oral keynote presentation*
- 5) Andrews A Benoit J Banerjee T, Quirion D, **Kanthan R (2019)** Mind the Gap in the Map' – Curriculum Mapping in Competency Based Medical Education implementation of General Pathology Residency in Saskatoon International Conference on Residency Education [ICRE] **September 26- 28**, Ottawa, Canada  
*This was presented as an oral podium presentation by pathology resident Dr Andrews*
- 6) **Kanthan R (2019)**-Breast Cancer -Past Present and Future Global Conference on Cancer and Therapeutic Approaches -**Aug 19-21** Dubai UAE  
*This was delivered as an invited oral keynote presentation*

## Presentations

### Invited lectures outside of U of S and invited conference presentations

Feb 2020	Guest Speaker and Chairperson -at 04 <sup>th</sup> International Pediatric and Perinatal Conference 05 <sup>th</sup> - 08 <sup>th</sup> February, Chennai India
Jan/Feb 2020	Invited Faculty MD Post Graduate Teaching Session -Saveetha Medical College, India
Jan 2020	Invited Workshop, Oral Abstract presentation and Judge at 17 <sup>th</sup> Asia Pacific Medical Education Conference [APMEC] 08 <sup>th</sup> -12 <sup>th</sup> January, Singapore
Jan/Feb2020	Invited Faculty Microscopic Slide Seminars/Workshops Sri Ramachandra University Chennai, India -Jan and Feb
Jan 2020	Invited Faculty Seminars x2 for the Rapid Post Graduate Review Course –Jan 04 <sup>th</sup> and 06 <sup>th</sup> Sri Ramachandra University Chennai, India
Nov 2019	Invited Keynote Presentation 2 <sup>nd</sup> World Congress of Surgeons, Nov 11-12, 2019, Istanbul, Turkey
Sep 2019	International Conference on Residency Education [ICRE] Sept 26- 28, 2019 Ottawa, Canada
Aug 2019	Invited Key note presentation -Global Conference on Cancer and Therapeutic Approaches, Dubai, UAE

## Uof S presentations Pathology Residents

As designated at academic Half days and Teaching Slide Rounds

## Grants

## Peer reviewed

April 2018- March 2020-

Ahmed Shahid, H.Chalchal, L Dwernychuk, **R Kanthan**, J Lim, R Rakheja, F Vizeacoumar, A Zaidi *FOLFIRI Alternate with FOLFOX in Untreated Metastatic Gastric and Esophageal Adenocarcinoma: The LOGIC Study*".

Operating Grant- Saskatchewan Cancer Agency -\$100,138.00

*I am a Co-Investigator as the pathologist in this multidisciplinary team grant*

## RECOGNITIONS AND AWARDS OUTSIDE CANADA SINGAPORE

2020 17<sup>th</sup> Asia Pacific Medical Education Conference [APMEC]

Finalist in the Free Communication Session [*One award*]

## Dr. Marilyn Kinloch

### **Book Chapters**

Schollenberg, E., **Kinloch, M.**, Terrance, J., & Lee, A. (February 2019). Gynecologic and Obstetric Pathology,

Volume 1 & 2. In Wenxin Zheng Oluwole Fadare Charles Matthew Quick Danhua Shen Donghui Guo (Ed.),

*Gynecologic and Obstetric Pathology, Volume 1 & 2*: Springer Singapore

Hoang, L., & **Kinloch, M.** Inflammatory Diseases of the Vulva.(May 2020). In Nucci M., Parra-Herran C. (Ed.), *Gynecologic*

*Pathology, 2 edition*: Elsevier

*Comment: The work was split equally between two authors.*

### **Peer Review Papers**

Baniak, N., Gilks, B., Decoteau, J., & **Kinloch, M.** (2019). Diagnostic Variation in p53 Usage for Endometrial

Carcinoma Diagnosis: Implications for Molecular Subtyping.. *International Journal of Gynecologic Pathology*, epub Sept 2019

## Dr. Donna Ledingham

Co-investigator (local lead investigator). CONCOR-1: A randomized, open-label trial of **CON**valescent plasma for hospitalized adults with acute **COVID-19** Respiratory Illness. Principal investigators: Arnold D, Begin P and Callum J. \$6000 start-up fees and \$1535 per patient. Hamilton Health Sciences (non-competitive).

## Provincial

**Ledingham D, van Vliet P, Harding S.** Province-wide implementation of tools and processes for blood request screening to ensure alignment with best practices and improve stewardship.

## Dr. Andrew Lyon

### Book – Chapters

Wu F, Lyon AW, Lyon ME. Chapter 10.3 The importance of selecting an appropriate method for measuring methotrexate concentration after glucarpidase rescue: immunoassay or LC-MS/MS? in Toxicology Cases for the Clinical and Forensic Laboratory, H. Ketha and U.Garg ed. Elsevier, 2020. pp 161-3.

Lyon AW, Zhrebetskiy VA, Wu F. Chapter 20.1 Evaluation of toxicity following ammonia exposure: A case report. in Toxicology Cases for the Clinical and Forensic Laboratory, H. Ketha and U.Garg ed. Elsevier, 2020. pp 397-9.

### Papers

1. Zhao Y, Izadnegahdar M, Lee M, Kavsak P, Singer J, Scheuermeyer F, Udell J, Robinson S, Norris C, Ph.D; Lyon AW, Pilote L, Cox J, Hassan A, Rychtera A, Johnson D; Mills NL, Christenson J, Humphries K. High-Sensitivity Cardiac Troponin - Optimizing the Diagnosis of Acute Myocardial Infarction/Injury in Women (CODE-MI): Rationale and Design for a Multi-centre Stepped-Wedge Cluster Randomized Trial American Heart Journal. in press
2. Lyon AW, Delayen K, Reddekopp R. "No lab tests" when you are born in *The Twilight Zone*: A Clinical Informatics Case Report J Appl Lab Med in press
3. Inman M, Lyon AW, Lyon OAS, Lyon ME. Estimated risk for insulin dose errors among hospital patients due to glucose meter hematocrit-bias in 2020. Arch Path and Lab Med in press
4. Andrews AR, Yu D, Lyon AW. Diagnostic challenges with acyclovir crystalluria: a case study. eJIFCC. 31(2): 157-63.
5. Lyon AW, Lyon ME. Evaluation of precision and bias specifications required to achieve the 2018 FDA guidance criteria for glucose meter performance using simulation models J Sci Diabet Technol. 2020; 14(3):513-8.
6. Inman M, Parker K, Strueby L, Lyon AW, Lyon ME. A simulation study to assess the effect of analytic error on neonatal glucose measurements using the Canadian Pediatric Society position statement action thresholds. J Diabet Sci Technol. 2020; 14(3):519-25.
7. Huntsman RJ, Tang-Wai R, Alcorn J, Vuong S, Acton B, Corley S, Laprairie RB, Lyon AW, Meier S, Mousseau DD, Newmeyer D, Prosser-Loose E, Seifert B, Tellez-Zenteno JF, Huh L, Leung E, Major P. Dosage Related Efficacy and Tolerability of Cannabidiol in Children with Treatment-Resistant Epileptic Encephalopathy: Preliminary Results of the CARE-E Study Front Neurol 03 July 2019.



## Poster Presentations

1. Arenson B, Lyon AW, Shah S. A case for a healthy dose of skepticism. Canadian Society for Internal Medicine. Halifax, NS, Canada. Oct 2019.
2. MacDonald AM, Kinniburgh DW, Gabos S, Lee B, Cheung P, Ackah F, Reichert M, Graydon J, Lyon AW, Jarrell J, Benade G. An overview of three phases of the Alberta biomonitoring Program. 11th Int Symp. on Biological Monitoring in Occupational and Environmental Health. Leuven, Belgium. Aug 2019.
3. Stephanie Vuong, Deborah Michel, Richard Huntsman, Andrew W Lyon, and Jane Alcorn. Determining plasma protein binding profiles of bioactive cannabinoids in human plasma. Cannabinoid Research Initiative of Saskatchewan - Symposium. Saskatoon, SK, Canada. August 2019.
4. McPherson J, Ethier D, Wu F, Lyon AW, Lyon ME. Can ethylene glycol metabolites be detected using a point of care lactate meter to assess the lactate gap? A case study. Amer Assoc Clin Chem. Anaheim, CA, USA. Aug 2019.

## Letters to Editors

Ferraro S, Lyon AW, Braga F, Panteghini M. Definition of analytical quality specifications for serum total folate measurements using a simulation outcome-based model. [Letter to the Editor] Clin Chem Lab Med 2019; Sept 14. doi: 10.1515/cclm-2019-0695.

## Dr. Fergall Magee



### Trailblazers of the Lab

Breakthroughs to the bench, in the clinic, and in every facet of the laboratory have helped diagnostic medicine grow from strength to strength. After months of collating reader nominations and judging by an expert panel, Dr. Fergall Magee was **rated #6 on "The Power List 2019"**. Nominators praised his strong leadership within the Royal College of Physicians and Surgeons of Canada, his contact with patients and families, and his work with medical students and residents. Notably, he was recognized for his efforts in hosting an outreach program for high school students to help expose them to laboratory careers. He is also a founding organizer and presenter for the Choosing Wisely Saskatchewan conference, which encourages appropriate test utilization and management by providing education to all healthcare professionals.

## Dr. Erick McNair

### Presentations

Oral presentation. Biomarkers of acute kidney injury following CPB-supported Cardiac Surgery, Faculty Research Day, Department of Pathology and Laboratory Medicine, University of Saskatchewan, November 26, 2019.

Invited oral presentation. Techniques in blood Conservation during cardiac surgery. 21st Annual Update on Perfusion Conference. Medical University of South Carolina, October 23-25, 2019, Charleston, South Carolina, United States.

### Publications

**McNair E**, Bezaire J, Moser M, Mondal P, Sawicki G, Reid D. Association of Matrix Metalloproteins with Acute Kidney Injury following CPB-supported Cardiac Surgery. American Journal of Nephrology. AJN-2020-6-29. (Submitted)

Gamble J, McKay W, Ambros B, Miller G, **McNair E**. A performance comparison of the most commonly used minimally invasive monitors of cardiac output. Canadian Journal of Anesthesia (CAAN-D-20-00710) June 25, 2020. (Submitted)

Bally, J. M. G., Spurr, S., Hodgson-Viden, H., **McNair, E**. Using an Interprofessional Competency Framework to Enhance Collaborative Pediatric Nursing Education and Practice. Journal of Interprofessional Care. (CJIC-2020-0342) June 24, 2020. (Submitted)

**McNair E**, McKay WP, Mondal PK, Bryce R. Transfusion Use and Hemoglobin Levels by Blood Conservation Method After Cardiopulmonary Bypass Ann Thorac Surg. 2020;S0003-4975(20)30541-5. doi:10.1016/j.athoracsur.2020.03.029

Spurr S, Bally J, Allan D, **McNair E**. Prediabetes: An emerging public health concern in adolescents. Endocrinol Diabetes Metab. 2019 Mar 1;2(2):e00060. doi: 10.1002/edm2.60.

Spurr S, Bally J, Bullin C, Allan D, **McNair E**. The prevalence of undiagnosed Prediabetes/type 2 diabetes, prehypertension/hypertension and obesity among ethnic groups of adolescents in Western Canada.

BMC Pediatr. 2020 Jan 23;20(1):31. doi: 10.1186/s12887-020-1924-6.

### Departmental and College Committees

Erick McNair: Deans Designate, Chair of a Ph.D. Defense, Liang Zhao, Studies of Stored mRNAs During Seed Aging in Arabidopsis thaliana, Brassica napus and wheat (Triticum aestivum), Department of Biochemistry, December 11, 2019.

## Dr. Ahmed Mostafa

### Publications

1. Smith AG, Pereira S, Jaramillo A, Stoll ST, Khan FM, Berka N, **Mostafa AA**, Pando MJ, Usenko CY, Bettinotti MP, Pyo CW, Nelson WC, Willis A, Askar M, Geraghty DE. Comparison of sequence-specific oligonucleotide probe vs next generation sequencing for HLA-A, B, C, DRB1, DRB3/B4/B5, DQA1, DQB1, DPA1, and DPB1 typing: Toward single-pass high-resolution HLA typing in support of solid organ and hematopoietic cell transplant programs. HLA. 2019 Sep;94(3):296-306. doi: 10.1111/tan.13619. Epub 2019 Jul 15.
2. Gareau AJ, **Mostafa AA**, Stamm L, Khan F, Berka N. The identification of a novel HLA-B allele, HLA-B\*27:05:38. HLA. 2019 Aug;94(2):157-158. doi: 10.1111/tan.13576. Epub 2019 Jun 3
3. Gareau AJ, **Mostafa AA**, Stamm L, Khan F, Berka N: The Identification of a Novel HLA-B Allele, HLA-B\*27:05:38. HLA. 2019 May 10. doi: 10.1111/tan.13576. [Epub ahead of print]

4. Gareau AJ, **Mostafa AA**, Williams J, Stamm L, Berka N: Identification of a Novel HLA-C Allele, HLA-C\*07:778, in an Unrelated Hematopoietic Stem Cell Donor. HLA. 2019 May 9. doi: 10.1111/tan.13575. [Epub ahead of print]
5. Thirukkumaran CM, Shi ZQ, Nuovo GJ, Luider J, Kopciuk KA, Dong Y, **Mostafa AA**, Thakur S, Gratton K, Yang A, Chin AC, Coffey MC, Jimenez-Zepeda VH, Stewart D, Chesi M, Bergsagel PL, Morris D. Oncolytic immunotherapy and bortezomib synergy improves survival of refractory multiple myeloma in a preclinical model. Blood Adv. 2019 Mar 12;3(5):797-812
6. Smith AG, Pereira S, Jaramillo A, Stoll ST, Khan F, Berka N, **Mostafa AA**, Pando Rigal MJ, Usenko C, Bettinotti MP, Pyo1 C, Nelson WC, Willis A, Askar M, Geraghty DE. Comparison of SSOP versus NGS for typing of HLA-A, B, C, DRB1, DRB3/B4/B5, DQA1, DQB1, DPA1, DPB1: toward single pass high resolution HLA typing in support of solid organ and hematopoietic cell transplant programs. Submitted to Human Immunology May 2018.
7. **Mostafa AA**, Meyers DE, Thirukkumaran CM, Liu J, Gratton K, Spurrell J, Shi Q, Morris DG. Oncolytic Reovirus and Immune Checkpoint Inhibition as a Novel Immunotherapeutic Strategy for Breast Cancer. Cancers (Basel). 2018 Jun 15;10(6). pii: E205. doi: 10.3390/cancers10060205.
8. **Mostafa, AA.**, Kostur, C., Stamm, L., M., Faisal, K., Berka, N: Characterisation of a novel allele HLA-C\*02:135N, by full-length genome sequencing in a Caucasian bone marrow donor. HLA. 2018 Mar 25. doi: 10.1111/tan.13260. [Epub ahead of print]
9. **Mostafa, AA.**, Faisal, K., Stamm, L., Petrosenko, M., and Berka, N. A novel HLA-A\*26 allele, HLA-A\*26:01:44, identified in a Caucasian individual. HLA. 2018 Feb;91(2):127-128. doi: 10.1111/tan.13182

### Dr. Oksana Prokopchuk-Gauk

#### Research

**Prokopchuk-Gauk O, Harding SR**, Co-Principle Investigators: Screening by Technologists and Auditing to Reduce Transfusion (START) study. Completed.

**Prokopchuk-Gauk O**, Saskatoon Site Principle Investigator, CONCOR-1: A Randomized, Open-Label Trial of CONvalescent Plasma for Hospitalized Adults with Acute COVID-19 Respiratory Illness (NCT04348656). Initiated.

**Prokopchuk-Gauk O**, Resident Research Supervisor (R2, Internal Medicine): O negative blood utilization and appropriateness audit for Royal University Hospital, Saskatoon. Completed. Virtual poster, SK Internal Medicine Resident Research Days, June 2020.

#### Publications

**Prokopchuk-Gauk O**, Contributor: *Warfarin Reversal* and *DOAC Reversal* modules of the treatthebleed.org website, designed to provide a practical, evidence based approach to front-line physicians on how to treat acquired bleeding: <https://treatthebleed.org/>

#### Presentations

**Prokopchuk-Gauk O**, Invited Co-Presenter (2019 August 14): AABB eLearning Webinar on Massive Transfusion Protocol Indications, highlighting activations in small urban and rural settings

#### National

**Prokopchuk-Gauk O**, Chair, National Advisory Committee (NAC) on Blood and Blood Products; Co-Chair, National Emergency Blood Management Committee (PEBMC).

#### Provincial

**Prevention of Alloimmunization in Mothers of Saskatchewan (PRAMS) Program** successfully implemented in February 2020; repatriation of all prenatal transfusion testing from CBS-Vancouver to hospital laboratories in Prince Albert, Regina and Saskatoon. National leaders in implementation of automated gel titration of antibodies in this context.

**Prokopchuk-Gauk O** (January 2020). *Transfusion Best Practice Recommendations in Adult Patients – Saskatchewan*.

### Dr. Anurag Saxena

#### Peer-reviewed Publications

**Saxena A**, Meschino D, Hazelton L, Chan M-K, Benrimoh DA, Matlow A, Dath D, Busari J. Power and physician leadership. BMJ Leader. 2019, Published Online First: 15 July 2019. doi:10.1136/leader-2019-000139

**Saxena A**. Transformative Learning: Promise, Premise and Challenges. Medical Education. 2019, 53: 534-536.

#### Conference Presentations / Abstracts

**Saxena A**, Robertson-Frey T, Desanghere L. Equity, diversity and engagement in medical education. International Conference on Residency Education (ICRE), Ottawa, ON. Sep 2019.

Desanghere L, **Saxena A**, Chan M-K, Moineau G. Critical success factors in medical education leadership. International Conference on Residency Education (ICRE), Ottawa, ON. Sep 2019.

Desanghere L, Claypool T, Walker K, **Saxena A**. GRIT, resilience and professional quality of life: investigating wellness in medical education. International Conference on Residency Education (ICRE), Ottawa, ON. Sep 2019.

**Saxena A**. Challenges and Strategies for success in a dyad leadership model. International Leadership Association Annual Conference, Ottawa, ON. Nov 2019.

**Saxena A**, Zhou C, Reiter HR, Dore K. The utility of CASPer for residency selection. Oral Presentation at Asia Pacific Medical Education Conference (APMEC). Singapore, Jan 2020.



Scott JA, Desanghere L, **Saxena A**. Strengths and challenges of the learning environment across postgraduate medical education. Canadian Congress of Medical Education. Vancouver (virtual), BC. April 2020.

**Saxena A**, Desanghere L, Robertson-Frey T, Raazi, M, Woods R. Evaluating workplace culture and resilience: Implications for the Implementation of Competence By Design. International Conference on Residency Education accepted for Fall 2020 presentation.

#### Workshops / Symposia (facilitated / co-facilitated)

**Saxena A**, Kanthan R. Leadership for inclusivity and cultural appropriateness. Asia Pacific Medical Education Conference (APMEC). Singapore, Jan 2020.

**Saxena A**. Session on, " Structured interviews / approach to hiring based upon values-fit and non-cognitive attributes." Part of the symposium on "Nurturing values for effective practice." Asia Pacific Medical Education Conference (APMEC). Singapore, Jan 2020.

#### Manuscript and Abstract Reviews

Ad-hoc reviews for annual meeting of the International Leadership Association, and manuscripts submitted to the journals; Teaching and Learning in Medicine, Journal of Health Organization and Management, Journal of Healthcare Leadership, and Psychology Research and Behavior Management.

#### Invited Guest Editor

For the journal "Administrative Sciences" for a special issue of "Leadership development in healthcare". Ongoing work.

#### Education

##### **1. Undergraduate medical education**

- a. Teaching in 1<sup>st</sup> and 2<sup>nd</sup> Year (Principles of Biomedical Sciences) Basic & Systems-based Pathology

##### **2. Interdisciplinary undergraduate teaching**

- a. Pathology for Physical Therapy students (PTH 805); Course Chair and Instructor
- b. Pathology for Health Professions (PTH 205); Instructor:
- c. Public Health Biology course (PBH 806), Instructor

##### **3. Postgraduate medical education**

- a. General Pathology residency program: Teaching in Hematopathology
- b. Other residency programs: Teaching on various aspects (accreditation, leadership, learning environment, well-being)

##### **4. Involvement in faculty development**

- a. Sessions for Program directors on Competence By Design, Accreditation, Continuous quality improvement in medical education, Residents in difficulty, PGME processes

#### **Dr. Rajendra K. Sharma**

#### Publications

Nair SP, **Sharma RK** (2020) Heat shock proteins and their expression in primary murine cardiac cell populations during ischemia and reperfusion. *Mol Cell Biochem* **464**, 21-26

#### Presentations

Basic Science Research at Core – **Rajendra K. Sharma** at Research Day, Department of Pathology & Laboratory Medicine, College of Medicine, University of Saskatchewan, Saskatoon, SK, Canada, November 26, **2019**

The Evaluation of potent cytotoxic curcumin analogs as methionine aminopeptidase 2 (MetAP2) inhibitors for treating colon cancer - **Sukanya Pati** at the Three Rs & Animal Research Symposium, University of Saskatoon, SK, Canada, October 18, 2019

The Evaluation of a potent cytotoxic designed to inhibit methionine aminopeptidase 2 with a view to treating colon cancer - **Sukanya Pati** at Research Day, Department of Pathology & Laboratory Medicine, College of Medicine, University of Saskatchewan, Saskatoon, SK, Canada, November 26, **2019**

#### Editorial Board

Editor-in-Chief: *Journal of Molecular Biology and Therapeutics*, 2018-present

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#### Dr. Sarah Tehseen

##### Provincial

**Tehseen S** (October 2019). *SHA Massive Transfusion Protocol (Pediatric)*.

**Tehseen S**. *Transfusion Best Practice Recommendations in Neonatal and Pediatric Patients – Saskatchewan (in development)*.



### Dr. Emina Torlakovic

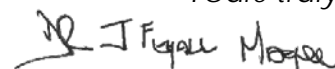
*On behalf of the Department of Pathology and Laboratory Medicine,  
I wish to congratulate **Dr. Emina Torlakovic** who has just been awarded the*

### **2020 CAP-ACP Distinguished Service Award.**

*This award was established in 1992 to 'give recognition to those CAP-ACP members who have contributed significantly to the development of the CAP-ACP as a truly representative association of the laboratory medicine disciplines in Canada.'*

*I ask that you join me in celebrating this recognition of the devotion to excellence and patient care in the area of laboratory medicine displayed Dr. Emina Torlakovic.*

Yours truly



Dr. J. Fergall Magee  
Provincial Head

### Dr. Maruti Uppalapati

#### Publications (Journal Article)

Woloschuk, RM., Reed, PMM., McDonald, S., **Uppalapati, M.**, & Woolley, GA. (2020). Yeast Two-Hybrid Screening of Photoswitchable Protein-Protein Interaction Libraries. *Journal of Molecular Biology*, 432(10): 3113-3126.

#### Publications (Conference Abstract)

Broqueza, J., Andrahennadi, S., Allen, K., Dickinson, R., MacDonald-Dickinson, V., **Uppalapati, M.**, & Dadachova, E. (May 2020). Using comparative oncology approach to develop radioimmunotherapy for osteosarcoma. In *Journal of Nuclear Medicine*, Volume 61, Supplement S1, 1222. Paper presented at SNMMI 2020 Annual Meeting Society of Nuclear Medicine and Molecular Imaging

#### Grants

Uppalapati, Maruti (PI) (January 2020 - December 2021). Developing reagents for radioimmunotherapy of pancreatic cancer, 30000.0 (CAD). College of Medicine Research Award, College of Medicine.

## Dr. Viktor Zherebitskiy

### Publications

1. Hernandez-Ronquillo L., Mahabadi H.M., Moien-Afshari F., Wu A., Auer R., Borowsky R., Mickleborough M., Zherebitskiy V., Huntsman R., Vrbancic M., Cayabyab F., Taghibiglou C., Tellez-Zenteno J.F. (2020) "The Concept of an Epilepsy Brain Bank", Frontiers Neurology (accepted)
2. Nissreen M., Wong D., Lum A., Lin J., Ho J., Zherebitskiy V., Lee C.-H., Yip S. (2020) "Characterization of IDH1/IDH2 mutation and D-2-Hydroxyglutarate oncometabolite level in dedifferentiated chondrosarcoma", Hum. Path. (submitted).
3. Lyon A. W., Zherebitskiy V.A., Wu F. (2020) "Evaluation of toxicity following ammonia exposure: A case report", (English), Toxicology Cases for the Clinical and Forensic Laboratory, Ch.20.1, 397-399.

### Poster at AANP-2020 meeting

1. Ramani B., Gupta R., Solomon D., Bollen A., Tihan T., Phillips D., King B., Treynor E., Zherebitskiy V., Markarian M., Walker J., Hofmann J., Sloan A., Perry A.(2020)" Paraganglioma of the filum terminale is likely a distinct clinicopathologic entity" (poster # 228, AANP-2020, Monterey, CA, USA, June 11-14, 2020).

## Dr. Barry Ziola

Received the honorary title of Distinguished Professor Emeritus upon his retirement from the U of S, 31 DEC 2019.





## Women Leading Philanthropy

Women Leading Philanthropy (WLP), with whom Dr. Marilyn Kinloch is involved, is a group of engaged, community-minded women that create meaningful change and advancements in health care by supporting leading-edge women's initiatives at Royal University Hospital. Dr. Jessica Minion from our Department was the keynote speaker for the WLP meeting in June, delivered online, and discussed the COVID-19 pandemic and the Saskatchewan response.



WLP \$100k to Dr. Soo Kim, second from left, on mapping out shoulder dysfunction after mastectomy for breast cancer.

## COVID-19 Research

**Dr. Ahmed Mostafa** (Principal Investigator), **Dr. Pouneh Dokouhaki** and **Dr. Fang Wu** (Co-Applicants) were successful in receiving \$10,000 in funding from the 2020 Rapid Response COVID-19 Research Award (sponsored by the Office of the Vice-Dean of Research and the Respiratory Research Centre) towards their project *Modeling for risk stratification of patients infected with COVID-19 based on cytokine profile and other immune-related biomarkers*.

This study will provide in-depth understanding of disease progression of COVID-19 and the association of biomarkers of immune response including cytokines, HLA typing and metabolomics markers with disease severity. With the use of artificial intelligence (AI) and machine learning and biomarker studies, the hope is to provide useful tools to the clinical team to perform individualized risk stratification and thus provide appropriate levels of patient care based on risk levels of individual patients without overwhelming specialized and intensive care resources.

# E

## EVENTS



Drs. Magee and Kinloch attended the **CAP-ACP Resident Review Course** in Toronto 24 JAN 2020.

At the Department-sponsored breakfast that morning, Drs. Magee and Kinloch were invited to give a few words at the CAP Friday night social held in the hotel lobby of the course. The residents were in good spirits, dressed up for the evening and ready to relax after a 10-hour day of lectures. This gave the two a chance to mingle and chat with the newest

pathology colleagues across the country. By cultivating these types of relationships early and promoting Saskatchewan as a desirable place to practice pathology, the goal is to improve recruitment to our Department.

Drs. Fergall Magee and Marilyn Kinloch along with Dr. Russell Price, Clinical Director, Department of Laboratory Medicine at the Royal Victoria Regional Health Centre in Barrie ON (and proud father of our PGY1 resident, Dr. Phillipe Price).

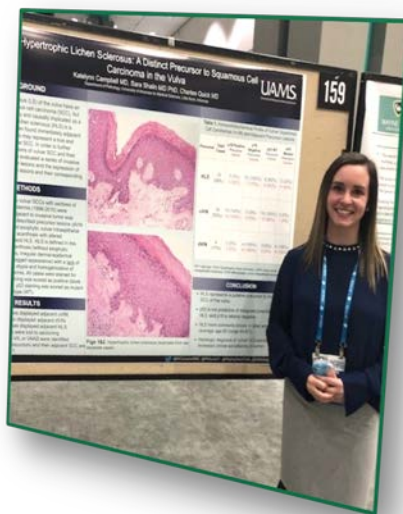


## Royal University Hospital Foundation's Royal Middle Earth Ball raised over \$234,000 to help save lives!



Saturday evening, 19 OCT 2019, guests of Royal University Hospital Foundation's Royal Middle Earth Ball presented by Nutrien were taken on a journey to the lands where elves and hobbits reside!

Dr. F. Magee, Allan Stonhouse, Lenore Howey, Dr. S. Sanche, Kam Omid, David McKinnon, Chelsea Kelln, Man Po Wong, Dr. P. Dokouhaki, Dr. M. Kinloch, Dr. A. Osmond



## USCAP 2020

29 FEB – 05 MAR 2020, Los Angeles CA

Dr. Campbell, our new Gyne/Derm joining the AP team in 2021.



## Banff Pathology Course SEP 2019

Drs. C. Wang, L. Quenneville & H. Rees



## Canadian Association of Pathologists (CAP)



The Canadian Association of Pathologists (CAP) Annual Meeting of 2019 (Niagara) was the last occasion when the Department hosted a 'Saskatchewan Night' Recruitment Event at our national conference. Unfortunately, COVID-19 arrived in Canada in early 2020, with the result that CAP 2020 (Halifax) and its 'Saskatchewan Night' were cancelled. It is hoped that the Annual Conference will return to Halifax in 2022 and will feature another Saskatchewan Recruitment Event. As we speak, CAP 2021 is scheduled for Saskatoon - COVID-19 allowing! Given that this is the first time that the Annual Conference has returned to Saskatchewan in many years, we hope to see many of you not only at the academic presentations but also assuming an active role in our planned Saskatchewan Night - a great opportunity for us all show the country our Department and Province!



## New Children's Hospital celebrates grand opening THU 05 SEP 2019

The Jim Pattison Children's Hospital (JPCH) officially opened to patients on September 29, when all pediatric and maternal inpatients moved in from Royal University Hospital and new admissions were accepted.

Premier Scott Moe was joined by lead donor Jim Pattison, representatives from the Government of Saskatchewan, Saskatchewan Health Authority (SHA) and Jim Pattison Children's Hospital Foundation, donors and community members to celebrate the official grand opening of the hospital.



## Visiting Lecturers

Dr. Andrew Hoofnagle, University of Washington. Canadian Society of Clinical Chemists – Travelling lectureship. Mass Spectrometry versus immunometric-based methods. 23 SEP 2019.

Dr. Nouredine Berka, Clinical Director & Clinical Professor, Histocompatibility and Immunogenetics Labs & Department of Pathology and Laboratory Medicine, Alberta Precision Labs & University of Calgary – Good to Great & Design Thinking: Two Concepts for Innovation and Excellence in Health Care. 30 NOV 2019.

Dr. Julia Keith, Neuropathologist from Sunnybrook, speaking on July 28, 2020 about Pathologist Burnout and the results of her national survey.





# SASKATCHEWAN ASSOCIATION OF LABORATORY MEDICINE (SALM)

Saskatchewan Association of Laboratory Medicine (SALM) represents professional interests of pathologists and others related to laboratory medicine physicians (e.g. medical microbiologists & infection control specialists, medical biochemists, transfusion medicine doctors, etc.) practicing in Saskatchewan.

## Objectives

1. As a section of a larger provincial professional organization, Saskatchewan Medical Association (SMA) representing all medical doctors in the province, SALM participates in negotiations of a frame contract between SMA and Ministry of Health (MOH).
2. As a self-governing structure, SALM takes care of the wellbeing of its members and promotes personal development of the membership.
3. As a part of the provincial educational structure, SALM, in close cooperation with the University of Saskatchewan (U of S) and Saskatchewan Health Authority (SHA), supports various educational activities of faculties and pathology residents.

## Membership

Regular SALM membership with voting option is open for all practicing pathologists and laboratory medicine doctors for a small annual fee. U of S general pathology residents usually join SALM at the beginning of their residency training free of charge as junior members (without voting option). Currently we have 39 regular members and 11 junior members. Most of our members are

practicing in two main cities in the province: Saskatoon and Regina. We also have representation in rural areas including Prince Albert, North Battleford and Moose Jaw.

## Executive Board

Current: president – **Dr. Viktor Zhrebetskiy** (Saskatoon; since 2018), vice-president – **Dr. Michael Presta** (Regina; since 2019) and secretary-treasurer – **Dr. Roland Auer** (Saskatoon; since 2019).

Past: presidents – Dr. Jill Wooff (Regina; 2017-2018), Dr. Fergal Magee (2016-2017); vice-president – Dr. Tamalina Banerjee (Saskatoon; 2017-2019), Dr. Jill Wooff (Regina, 2016-2017); and secretary-treasurer – Quentin Nakonechny (Saskatoon/Regina; 2018-2019), Viktor Zhrebetskiy (Saskatoon, 2017-2018), Dr. Mary Kinloch (Saskatoon; 2016-2017).

## Committees & Representation

Currently, SALM has only one standing committee – SALM Negotiation Committee (SALM-NC). SALM-NC includes 6 standing members (three from Saskatoon – **Drs. S. Angel, V. Zhrebetskiy** and **J. Kalra**; three from Regina – **Drs. J. Minion, J. Wooff** and **M. Presta**; and one



from rural Saskatchewan – **Dr. R. Sabaratnam**).

Currently, SALM has one SMA representative for semi-annual SMA assembly meetings (**Dr. M. Kinloch**) and one representative in the SMA Intersectional Council (**Dr. S. Angel**).

### Historical Millstones

There are four historical periods in SALM history: initial (1970-1980'th), activity (1990-early 2000'th), dormancy (late 2000-beginning 2010'th) and current (starting from 2014 until now). The original name of association was Saskatchewan Association of Pathologists (SAP). Most of SAP members were general pathologists practicing anatomical and clinical pathology across the province. However, modern specialization of pathology led to a need to reach out and include more narrow specialized doctors practicing in different areas of provincial laboratory medicine. Therefore, under leadership of Dr. Fergall Magee (current Provincial Head of Laboratory Medicine with SHA and Head of Pathology and Laboratory Medicine Department with U of S) SAP was transformed into SALM in 2014. Drs. Mary Kinloch and Jill Wooff, current SHA acting provincial clinical leads in anatomical pathology for Northern and Southern Saskatchewan contributed significantly to this transformation among other SALM members.

### Recent Developments

1. SALM held its last face-to-face meeting on November 1, 2019 as a part of the semi-annual SMA meeting. Several pathologists left the province for personal reasons (Dr. Q. Nakonechny went to Edmonton, AB; Dr. O. Al-Nourhji to Ottawa, ON; Dr. C. Herath to Kitchener, ON; and Dr. M. Podberezin to Boston, MA, USA). SALM expressed gratitude for their participation in its

activities. Several new pathologists arrived to the province (**Dr. A. Poulin** arrived from Seattle after finishing a pediatric pathology fellowship, **Dr. D. Ravi** came from Toronto after finishing her GI fellowship and **Dr. A. Gruza** returned from Vancouver after finishing an oral pathology fellowship). SALM welcomed new members. **Dr. F. Magee** shared his prospective on recent developments with restructuring of laboratory service under the SHA umbrella. All geographic and specialty SALM sections presented their reports and voiced their immediate needs. It was decided to continue supporting residents with their educational travels. It was also decided to proceed with the Dr. M. O. Shokeir Memorial Lecture endowment fund creation and create a new SALM endowment fund to promote excellence and support SHA and PALM staff members including BSs, MLTs and MLAs. Action plan was established, and new vice-president and secretary-treasurer were appointed.

2. Based on the action plan, SALM representatives approached Health Minister (Mr. Jim Reiter) during SMA meeting and secured his support for three key areas required MOH participation: liquid based cytology, regional hematopathology review service and development of molecular genetic testing in the province.

3. Based on the action plan, SALM approached U of S representatives for help with preparation terms of reference for Dr. M. O. Shokeir Memorial Lecture endowment fund and SALM endowment fund for BSs, MLTs and MLAs. As a result of this collaboration, both endowment funds are currently fully operational and expecting their first applicants.

4. Based on the action plan, SALM partially funded general pathology residents travel to the annual CAP-ACP 2020 review course (January 22-25, 2020,



Toronto) that the residents chose this time instead of traditionally funded participation in Banff pathology conferences.

5. Based on recommendations of SALM-NC and SMA Negotiation Committee (**Mr. Ed Hobday** and **Mr. Marcel Nobert**) and endorsement from SALM membership, SALM supported 5-year SMA-MOH frame contract with 5% increase in base salary for all SALM members. **Dr. S. Angel** was reinstalled as SALM representative in the SMA Intersectional Council (SMA-IC) and participated in several SMA-IC meetings. As a result of this activity, SALM members are expecting to receive significant compensation until the end of 2020. Also, further activities are planned to support CME, CMPA, on-call and other relevant SMA compensation programs.

6. SALM continues its activities in promotion of the pathology and

laboratory medicine program in the province and beyond it through development of SALM website and participation in other provincial and departmental initiatives.

### COVID-19

Pandemic of COVID-19 significantly affected face-to-face communication between specialists in the province. Many meetings were cancelled, including spring 2020 SMA and SALM meetings that were supposed to take place in Saskatoon in May 2020. Nevertheless, SALM, as a part of the provincial laboratory service, is putting significant efforts in support of its members and other members or laboratory medicine team in these difficult times, hoping to resume fully its regular activities in fall 2020.

The Department of Pathology & Laboratory Medicine wishes to acknowledge SALM's generous support of this year's Annual Report by providing funding to ensure all provincial faculty, residents, laboratories in regional and district hospitals, senior leadership in the CoM and SHA, Hospital Foundations and various stakeholders receive a copy.



# HOSPITAL FOUNDATIONS

## Acknowledgement

In the past year, Hospital Foundations have contributed funding support for the Nutrien Chair in Clinical Research (partnered investment initiated by the Royal University Hospital Foundation's Nutrien Endowment and the College of Medicines Vice-Dean of Research-please see fuller description in section entitled Nutrien Chair), a **Fellowship Bursary** to enable Dr. Glenda Wright to obtain Dermatopathology training in Dalhousie University and implementation of **Next Generation Sequencing** and other **genomic technology** in the Genomics Laboratory of RUH (**Royal University Hospital Foundation**), purchase of a **microscope** for Dr. Nick Baniak about to return from a Genito-Urinary Fellowship in Harvard ('Equip for Excellence' SCHF) and **virtual microscopy implementation** to connect the province and Saskatchewan pathologists to outside the province for primary diagnostic and consultative services- **Saskatoon City Hospital Foundation**.



We were able to complete the provincial campaign support to acquire **NanoString Technology** for the Dr. Marc Baltzan Histocompatibility (HLA) Laboratory and **Cellavison** for the Hematopathology Laboratory in St. Paul's Hospital (**St. Paul's Hospital Foundation**), and the purchase of an automated immune-assay platform (**Qunatalyser**) to stimulate development of a Provincial Immunodiagnostic Laboratory in St. Paul's Hospital (Community COVID Foundation). In addition, we are currently involved with other Hospital Foundations around extending the proposed Cellavison Network to provide support for Rural and Northern locations, including Swift Current, Moose Jaw, Yorkton, Prince Albert and North Battleford and optimizing the **Laboratory Information System** in Shellbrook (**Shellbrook Hospital Foundation**). We really appreciate the hard work of all connected with Saskatchewan Hospital Foundations and are extremely grateful for your active support as we strive to ensure a patient centred and sustainable laboratory medicine system.

We wish to acknowledge the support that we have received from Saskatchewan's Hospital Foundations. All have displayed a deep commitment for on-going support as we strive to deliver high quality services that are integrated, accessible and appropriate for all patients in Saskatchewan.

# Royal University Hospital Foundation



(l-r)

Ad Hoc Member **Arla Gustafson**, CEO, Royal University Hospital Foundation

**Mark Loeppky**, President, FFUN Motor Group

**Mike McKague**, Associate, Precedence Private Wealth

Member at Large **Kaylynn Schroeder**, Retired

Member at Large **Doug Osborn**, Partner, MLT Aikins LLP

**Sharon McDonald**, Private Banker, RBC Wealth Management

Chair **Don Neufeld**, Executive Chairman, J&H Builder's Warehouse

**Dr. Marek Radomski**, Vice-Dean of Research, College of Medicine, University of Saskatchewan

**Dr. Marilyn Baetz**, Vice-Dean of Faculty Engagement, College of Medicine, University of Saskatchewan

**Tyler Pochynuk**, Director of Operations, Clark Roofing (1964) Ltd.

Vice-Chair **Irene Boychuk**, FCPA, FCA, Partner, EY LLP

**Joe Vidal**, President, Bioriginal Food & Science Corp.

**Valerie Arnault-Pelletier**, Aboriginal Coordinator, College of Medicine, University of Saskatchewan

**Nilesh Kavia**, CPA, CMA, MBA, Executive VP of Operations, Affinity Credit Union

# St. Paul's Hospital Foundation



Standing centre (l-r): **Dr. Bruce Berscheid**, St. Paul's Hospital Local Council; Neil Weber, Board Chair

Back row (l-r): **Nicholle Povhe**, Treasurer; **Lecina Hicke**, CEO; **Ron Hyggen**; **Shari Watson**, Secretary; **Arlene Jorgenson**; **Chris Boychuk**, Past Chair; **Steeg Holmes**

Seated (l-r): **Gwen Dueck**; **John Agioritis**; **Dr. Vivian Walker**, Vice-Chair; **Kevin Sharfe**; **Doreen Howlett**; **Karen Barber**, St. Paul's Hospital Executive Director



# Saskatoon City Hospital Foundation



Saskatoon City Hospital Foundation CEO and Board of Directors 2019 – 2020

Back row (l-r) **Rosine Garabedian**, **Warren Postlewaite**, **Holly Ward**, **Braden Turnquist**, **Steve Shannon (CEO)**, **Randy Singler (Chair)**, **Dr. Kabir Verdi**, **Tracy Arno**, **Depesh Parmar**.

Front row (l-r): **Terry Sirois**, **Deven Stewart**, **Tj Keller**, **Liam Mooney**, **Heather Ryan**, **Meghan Gervais**.

# Shellbrook Hospital Foundation

Shellbrook Hospital Foundation Board:

Chairman – **Ron Ferster**

Vice chair – **Dennis Benke**

Secretary – **Dave Knight**

Treasurer – **Darlene Otet**

Members: **Kitty Larson, John Priestly, Bruce Harper, Robert Girod, Amund Otterson, Wayne Pringle, Perry LaComte, Marcie Kreese**

# Yorkton Health Foundation

Yorkton Health Foundation Board:

**Diane Rusnak**

Co-Chair

**Kris Sapara**

Co-Chair

**Doug Jones**

Treasurer

**Brad Bazin**

Director

**MaryAnne Trischuk**

Director

**Warren Kotzer**

Director

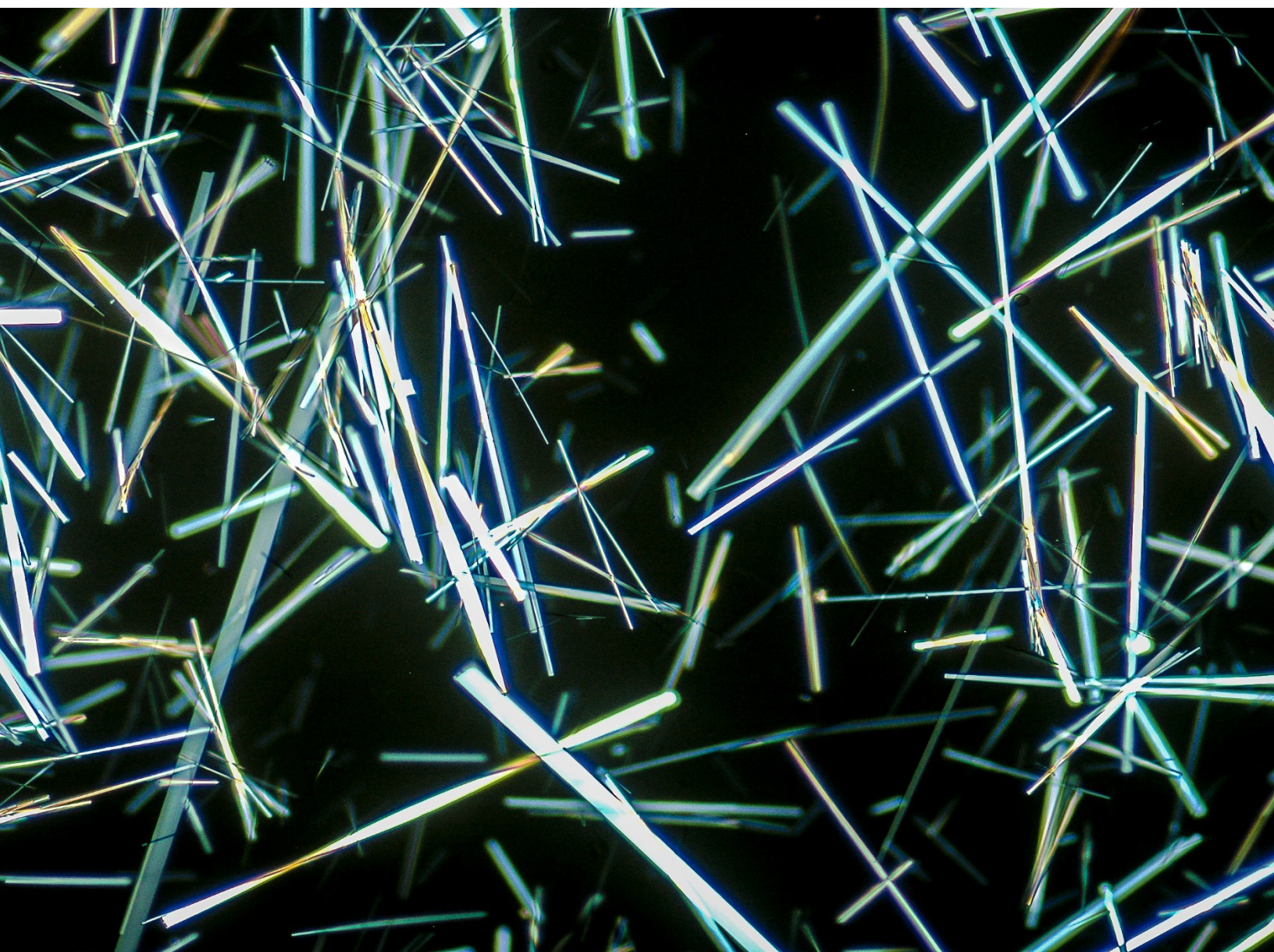
**Christina Denysek**

Director

**Don Hood**

Director





Photomicrograph of acyclovir crystals in a urine specimen viewed with a polarizer  
Photo selected by the General Pathology Residents  
Photo credit: Dr. A. Andrews (Resident) and Dr. D. Yu (Urologic Pathologist)

Laboratory Medicine – the science behind the cure.