

### 2021 Annual Report







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### **Territorial Acknowledgment**

We acknowledge the traditional territories of the people of the Treaty 7 region in Southern Alberta, which includes:

- The Blackfoot Confederacy comprising the Siksika, Piikani, and Kainai First Nations
- The Tsúūt'ínà First Nation
- And the Stoney-Nakoda including the Chiniki, Bearspaw and Wesley First Nations
- The City of Calgary is also home to Metis Nation of Alberta, Region III.

The University of Calgary is situated on land adjacent to where the Bow River meets the Elbow River, and that the traditional Blackfoot name of this place is Mohkinsstsisi, which we now call the City of Calgary.



This publication has been produced by the Department of Pathology and Laboratory Medicine a member of Alberta Precision Laboratories under Alberta Health Services and the Cumming School of Medicine, University of Calgary.

Submitted by: Dr. Dylan Pillai Professor and Head Department of Pathology & Laboratory Medicine University of Calgary, Cumming School of Medicine South Sector Medical Director, Alberta Precision Laboratories (APL)

Acknowledgments: Content Prepared by: Dr. Dylan Pillai, Dr. Tarek Bismar, and Ms. Julia Johnston.

Submissions from: Division/Section Heads Managers, Program Directors

We wish to thank all DPLM staff, administrators, and other team members whose efforts made this report possible.

and

A copy of this document is available at: cumming.ucalgary.ca/departments/pathology

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### **Executive Summary**

#### Colleagues

The year 2021 marked another year of what can only be described as constant 'churn'. The term churn is often ascribed to the production of butter, a delectable condiment we apply to enrich and improve the taste. However, the churn we are experiencing in laboratory medicine cannot be, in all good conscience, a means to something that will taste better for all involved. Calgary consistently enjoyed an integrated laboratory service delivery model with close relationships formed with our clinical colleagues. Coupled to this, was the integration of the Department of Pathology and Laboratory Medicine into the service delivery model and our academic faculty members. Together this provided cutting edge laboratory medicine and the opportunity to constantly innovate through relatively nimble footing. In contrast, we are now experiencing increasing provincialization (the Canadian jurisdictional term but also the original meaning) of laboratory services and the insertion of a private laboratory service into the mix. This inevitably leads to disintegration of the services with a "fire-wall" between public and private, provincial and local, but also disengagement of our faculty who may not feel empowered to influence and make decisions. This sounds like a doomsday characterization of our future. But it is not necessarily so. Despite what may have happened in the past with this model, our clinical relationships can remain, if we nurture them and treat our colleagues with the respect each deserves. Both service providers and academicians are equally important, as are our educators. We have a mission in our Department to foster all three pillars and seek synergies. We must continue to engage our subject matter experts and not bypass them in the name of expediency. Patient care trumps all.

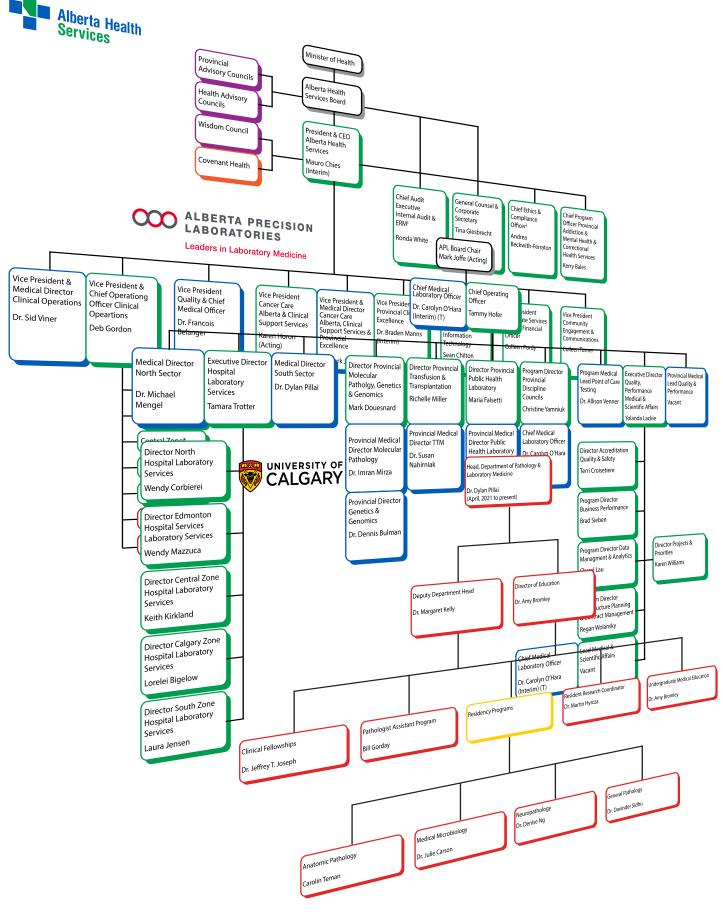
Let us look forward and focus now on some positive elements. Our Connect Care launches to date in the Calgary Zone hospitals have gone well. The new lab information system will go live in 2023 and will be transformative for the clinical laboratory and fully integrate data for the province. This should empower opportunities to conduct population-based research and create efficiencies for all involved. Funding from Alberta Innovates to the tune of \$3m was a highlight this year. The Alberta Diagnostics Ecosystem Platform for Translation (ADEPT) will permit local start-ups to take advantage of our clinical laboratories and samples to further their path to commercialization. Many companies are spin-offs from University of Calgary and University of Alberta. The successful proponent for the privatization of laboratory services was DynaLIFE Medical Labs partly owned by Labcorp USA. A familiar entity in the North of the Province, we hope to start a fresh and positive relationship with the new private provider. I am happy to report that DynaLIFE have decided to create new VP Academics and Clinical Director Academics roles to help foster research, education and other matters of common interest. All parties will be members of an Academic Liaison Council where open and free dialogue can occur. The Department continues to work closely with colleagues in the Cancer Centre and the Arnie Charbonneau Institute where a newly minted Translational Research Core (TRC) will be initiated. The TRC will house state-of-the-art equipment to enable translational research in cancer, pathology, chemistry, and microbiology, amongst other fields. We continue to have thriving residency training programs in Anatomic Pathology, General Pathology, Medical Microbiology, and Neuropathology. We have highly successful Fellowship programs and Areas of Focus Competence endorsed by the RCPSC. Our Faculty continue to publish at ever-increasing rates and paradoxically the COVID-19 pandemic inspired our GFT members to garner more, not less funding. Challenges to research, education, and sub-specialty leadership have been the elimination of the former CLS research competition, cuts to our residency training program funding, and reduction in stipends to our sub-specialty group leaders.

At the core, we still have highly trained, world-class academic and clinical faculty that continue to provide excellent clinical service, conduct cutting edge research and train the next generation of laboratory physicians.

Respectfully yours,

Dylan R. Pillai MD, PhD, FRCP(C) (he/him/his) Professor & Head Department of Pathology & Laboratory Medicine Cumming School of Medicine University of Calgary

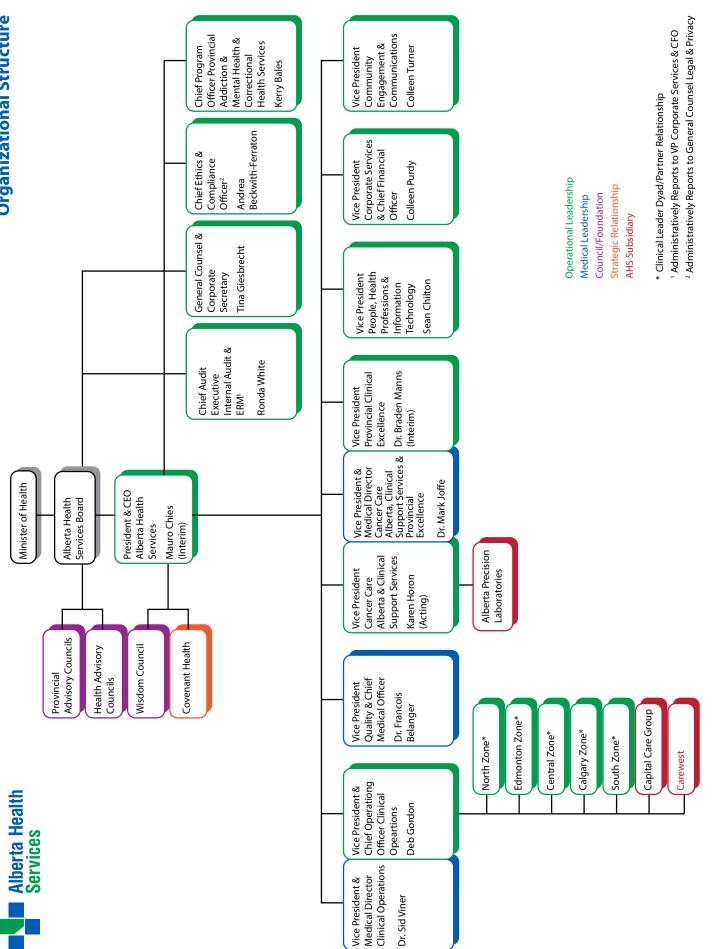
### **Organizational Structures**



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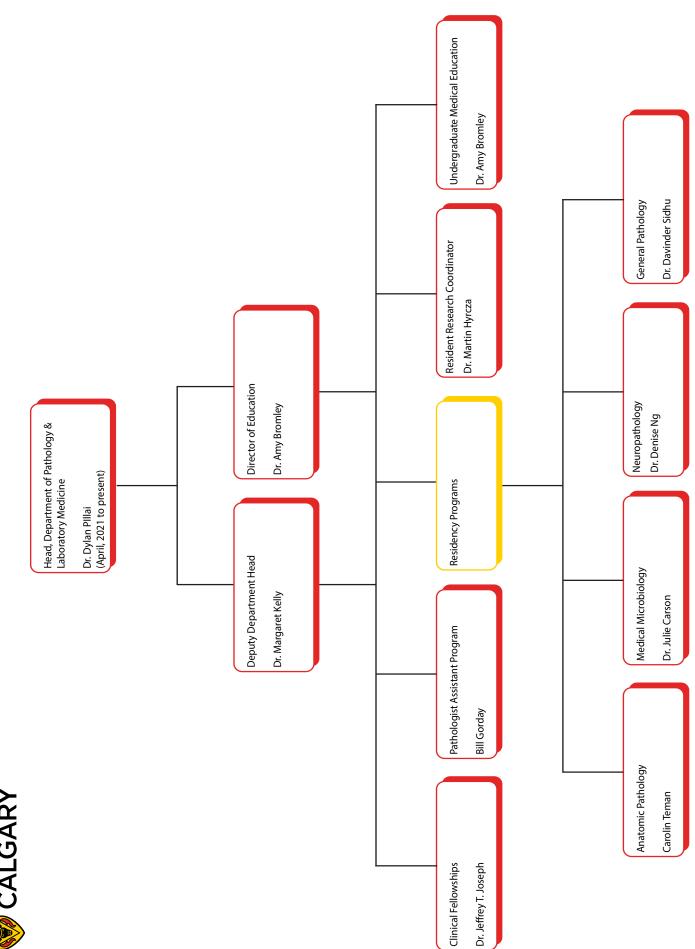






ALBERTA PRECISION LABORATORIES Leaders in Laboratory Medicine		APL Board Chair Mark Joffe (Acting) Chief Medical Chief Officer	A Chair e (Acting) Chief Operating Officer		Organiz	Organizational Structure
		Dr. Carolyn O'Hara (Interim) (T)	Tammy Hofer			
Medical Director South Sector Dr. Dylan Pillai	Director Provincial Molecular Patholgy, Genetics & Genomics Mark Douesnard	Director Provincial Transfusion & Transplantation Richelle Miller	Director Provincial Public Health Laboratory Maria Falsetti	Program Director Provincial Discipline Councils Christine Yamniuk	Program Medical Executive Directo Lead Point of Care Quality, Testing Performance Dr. Allison Venner Scientific Affairs Yolanda Lackie	Executive Director Provincial Medical Quality, Lead Quality & Performance Performance Medical & Vacant Scientific Affairs Valanda Lackie
	Provincial Medical Director Molecular Pathology Dr. Imran Mirza	Provincial Medical Director TTM Dr. Susan Nahirniak	Provincial Medical Director Public Health Laboratory Dr. Graham Tipples	Chief Medical Laboratory Officer Dr. Carolyn O'Hara (Interim) (T)	Director Accreditation Quality & Safety Terri Croisetiere	
	Provincial Director Genetics & Genomics Dr. Dennis Bulman				Program Director Business Performance Brad Sieben	
					Program Director Data Managment & Analytics Cheryl Lau	Director Projects & Priorities Karen Williams
					Program Director Infrastructure Planning & Contract Management Regan Wolansky	
				Chief Medical Laboratory Officer Dr. Carolyn O'Hara (Interim) (T)	Lead Medical & Scientific Affairs Vacant	
						Operational Leadership Medical Leadership





### **Section Reports**



### **Anatomical Pathology**

The Anatomic & Cytopathology Division of the Department of Pathology & Laboratory Medicine faced many and debilitating challenges in 2021. The impact of Covid-19 was extensive and severe affecting teaching, research and diagnostic work. The biggest impact was due staff health challenges. Many staff, medical and technical and support staff needed to

isolate or take time off due to being symptomatic or in contact with Covid positive members of family. Being consistently short staffed due to absences from Covid or delegation of staff for Covid testing labs made it hard to keep up with work assignments.

One medical staff hired at a hospital site was able to travel to Calgary due to relaxation of travel restrictions, the site had worked shorthanded for months. Another staff was overseas and unable to travel back to Calgary.

A small project with optimization of Data Entry department in Anatomic Pathology was achieved by cross-training.

The Amsterdam protocol was introduced in dissecting high-risk placenta specimens for optimal examination and reporting. This updated format allows from better detection of abnormalities and patient care.

A project undertaken to reduce backlog of cases in dermatopathology was initiated with a multi-pronged approach. Discussion with Dermatologists, AHS and re-distribution of work across different zones significantly improved the backlog.

No new equipment was purchased during this year.

Respectfully submitted,

Ranjit Waghray Section Chief and Clinical Professor, Anatomic-Cytopathology, DPLM Cumming School of Medicine U of Calgary

### **Clinical Biochemistry Division South Sector**

### Awards

- 2021 Hossein Sadrzadeh Outstanding Contribution to Education Award. Canadian Society of Clinical Chemists
- 2021 Dennis Orton Departmental Service Award. APL South Sector
- 2021 Cody Lewis Trainee abstract award. American Association of Clinical Chemists Industry Division Poster Winner

### **Department Updates & Accomplishments**

### **Research update:**

- Canadian Longitudinal Study on Aging (CLSA) continues smoothly. In addition, the Chemistry Lab performed over 55, 945 tests for Covid antibodies for the CLSA study. Furthermore, APL worked with a CLSA team to develop a dried blood spot project for measuring HbA1c in dried blood specimens on the participants.
- Thyrotropin receptor antibody (TSI) project (PI, Dr. Sadrzadeh) received more funding from Siemens. The results of the study are extremely promising. A draft manuscript is being written and under review by all the investigators and will be submitted in the near future.



- "Defining an optimal IGF-1 concentration in children undergoing in Treatment of Growth Hormone Deficiency" (PI, Dennis Orton) To repatriate testing for Insulin-Like Growth Factor 1 by LC-MS (currently sent to Quest Labs). Project will focus on IGF-1 in the context of patients being treated for Growth Hormone Deficiency, and is a collaborative effort between Dennis Orton and Carol Huang, a Pediatric Endocrinologist. The project continues very successfully and comparison results for the new APL developed method are very comparable to those of the reference laboratories, and the methods should be implemented in the South Sector APL in the near future.
- Development of a screening method to predict adverse outcomes in 5-FU chemotherapy (PI, Dr. Dennis Orton, Co-investigators, Dr. Bill Kangarloo, Dr. Jessica Boyd, Dr. Patricia Tang, Dr. Richard Lee-Ying). APL grant.

### Fellowship update:

- The Clinical Chemistry Fellowship Program at APL South Sector was re-accredited by the Commission on Accreditation in Clinical Chemistry (ComACC, USA) for the next 5 years. Due to the pandemic the inspection for ComACC was done virtually and completed in August 2021.
  - The president of ComACC and another commissioner thoroughly inspected our program and after 2 days of interviews and reviewing documents, the inspectors were greatly impressed with the quality of our program and our fellows. There were no deficiencies to report and in their immediate response the commissioners indicated that our program has been re-accredited of which the official letter and certificate will be forthcoming.
- The Clinical Chemistry Fellowship Program at APL South Sector was re-accredited by the Canadian Academy of Clinical Biochemists (CACB) for the next 3 years. Due to the pandemic the inspections for CACB were also done virtually and completed in September 2021.
  - The CACB inspection was conducted by two inspectors who are Clinical Chemists in Canada. They thoroughly reviewed the program and verbally informed the program co-directors there were no deficiencies, and they had some recommendations they will submit with the official written reports.
- The above indicates that the graduate trainees from the Clinical Chemistry Fellowship Program at APL South Sector are qualified to work in both Canada and the United States of America.
- Dr. Dustin Proctor has officially moved to his position as the Director of the Clinical Chemistry Lab at Grande Prairie and has been doing an outstanding job according to the leadership of Chemistry in the North Sector.
- Dr. Cody Lewis, our second-year fellow, is doing well and is set to complete the program on June 30, 2022.
- Dr. Michael Reid started as the first-year fellow on July 1, 2021.
- Drs. Dustin Proctor and Cody Lewis (2nd year fellow) presented several posters at the AACC and CSCC Annual Meetings.

### **Clinical Service & Accomplishments:**

- AACC Rocky Mountain Section Meeting, April 2021
  - Chair Dr. Hossein Sadrzadeh, Vice Chair Dr. Jessica Gifford, Coordinator Shawna Pitman We planned a meeting for all the clinical chemists and laboratorians from Canada and the United States to attend a one-day virtual conference focusing on "The Frontiers in Clinical Chemistry". The meeting was scheduled for the spring of 2020 and due to the COVID pandemic was postponed and held virtually in April 2021 with a record number of attendees and was extremely successful.
- Isolde Seiden Long has been actively involved with ISO and CLSI: CLSI EP23 - Laboratory Quality Control Based on Risk Management – Document Drafting Committee – work starting in Feb 2021
  - ISO TC212 Working group 1 ISO standard on Laboratory Developed tests –Promoted to co-project lead for this document– this project will take 2-3 years to complete
  - CLSI EP26 User Evaluation of Between-Reagent Lot Variation, Clinical Laboratory Standards Institute. Currently revisions completed and anticipated publication Nov 2021

### DSC Chemistry (Hossein Sadrzadeh, Jessica Gifford, Allison Venner)

• All sites within the Chemistry Department rolled out new, provincially harmonized reference intervals for 19 commonly ordered chemistry tests. These reference intervals are derived via statistical analysis of provincial population data and will be employed by all Chemistry labs in the province easing the interpretation of these tests by clinicians.

- The Core Chemistry Lab at DSC began to receive new instruments from Roche Diagnostics, the winner of the APL Wet Chemistry RFP. DSC Chemistry received two new lines (out of four total) of cobas<sup>®</sup> 8000 instruments. The go-live for these instruments is 2022.
- New Clinitek Advantus urinalysis instruments implemented
- New ALT and AST reagents with pyridoxal phosphate addition implemented
- New biotin resistant formulations of hsTnT, NT-pro BNP, TSH, total PSA and free PSA were implemented

### DSC Analytical Toxicology (Jessica Boyd, Hossein Sadrzadeh, Dennis Orton) & Pharmacokinetics Lab (TBCC) (Dennis Orton)

- Repatriation of Thiopurine Methyltransferase (TPMT) Phenotyping (PK Lab TBCC).
- Repatriation of Urinary and Salivary Cortisol from DSC Immunochemistry to be run on the Mass Spec.
- Implementation of the rapid clozapine method reporting both drugs and metabolites (2-minute method).

### Lethbridge Chemistry (Dennis Orton)

- Folate Orders
  - Lab performed 1800 tests per year (APL annually runs 30,000 35,000 folate tests per year).
  - Initiated a utilization trial by canceling all the folate orders by GPs and instructed the ordering physician to call Dr. Orton if they truly needed the test.
  - This successful study continues in Lethbridge and will be extended to other parts of the South Sector.



This approach has resulted in a 99% reduction in folate testing.
Went live with new Roche cobas<sup>®</sup> Pro analyzers (awarded as part of the provincial wet chemistry RFP) as the first site in North America.

### DSC Endocrinology/Immunochemistry Lab (Jessica Gifford)

- Dr. Alex Chin resigned from APL in December of 2021.
- Dr. Jessica Gifford assumed the responsibilities in the Immunoassay lab.
- Placenta growth factor (PlGF) testing continues to be used for research use only.
- The Immunochemistry Lab discontinued salivary and urine cortisol by immunoassay.
- The salivary and urinary cortisol will be performed by mass spectrometry in the Analytical Toxicology Department.

### **RGH** (Jessica Gifford)

- RGH Chemistry received two new cobas<sup>®</sup> Pro lines. With the receipt of these instruments both DSC Chemistry and RGH Chemistry began the method verifications required to put these instruments into use with go live dates planned for 2022
- RGH went live with the new Roche Infinity middle-ware in the fall of 2021
- New ALT and AST reagents with pyridoxal phosphate addition implemented with new reference intervals
- New biotin resistant formulations of hsTnT and NT-pro BNP implemented
- New Clinitek Advantus urinalysis instruments implemented

### ACH (Lawrence de Koning)

- Quidel triage back-up meter for whole-blood conventional Troponin I to facilitate rapid troponin testing in pediatric patients was validated and implemented
- Infinity middle-ware for Roche chemistry analyzers was implemented
- New pyridoxal-5-phosphate supplemented AST and ALT reagents for Roche chemistry analyzers was implemented

### FMC and PLC (Isolde Seiden Long)

- Roche inventory management solution implemented at FMC as the pilot site
- New Clinitek Advantus urinalysis instruments implemented
- New ALT and AST reagents with pyridoxal phosphate addition implemented with new reference intervals
- New Roche Infinity middle-ware implemented
- New biotin resistant formulations of hsTnT and NT-pro BNP implemented

### Rural & Health Centre Testing Lab Chemistry (Jessica Gifford)

- Barricor tube (Becton, Dickenson and Company) study implemented at Sheldon M. Chumir Health Centre. The aim of this study was to improve the specimen quality for high sensitivity troponin I testing performed on the BioMérieux mini-VIDAS at a number of rural and health centre testing labs.
- Airdrie Health Centre Testing lab went live with a blood gas instrument on site.

### **Red Deer (Yury Butorin)**

• Went live with new Roche cobas<sup>®</sup> Pro analyzers (awarded as part of the provincial wet chemistry RFP) as the second site in North America.

Respectfully submitted,

Hossein Sadrzadeh

### **Cellular Therapy Lab**

### **Milestones:**

- CTL experienced at 30% increasing in processing services for the Alberta BMT Program in 2021 as compared to 2020 service numbers.
- CTL now provides services for the Alberta Cellular Therapy Program
- CAR T standard of care HC approved products from Gilead and Novartis for treatment of hematologic malignancies
- CAR T Clinical trial products from Novartis, Janssen, Celgene for hematologic malignancies.
- CAR T Clinical trial using point of care manufactured CD19 CAR T (made in Alberta CAR T)
- Initiated Clinical trial validation for treatment of solid tumor with CAR T Cells
- Dr. Prokopishyn Appointed chair of standards committee for FACT
- CTL continued validation of new software LIS for CTL , expected go live Fall 2022
- CTL continued build for new Calgary cancer centre
- Dr. Prokopishyn author on Gene Therapy Clinical trial manuscript published in Nature communications

### **General Pathology**

### New Testing and Instrumentation Roll-outs

- Successful planning, validation, training and implementation of on-site ID NOW instruments to bring COVID-19 molecular testing to dozens of acute care sites in Central, Calgary and South Zones, building upon pilot project work in the North Zone. This allowed for local rapid testing for patients with negative verification testing supported by Regional and provincial laboratories, and significantly improved turn-around-times for COVID-19 testing in our rural laboratories. This testing roll-out was completed with the cooperation and leadership of the provincial microbiology, operations and logistics teams.
- Successful roll-out of more than 15 Vitros XT3400 instruments within Central and South Zones with extensive planning, installation, validation, training and implementation. These instruments replaced the previous Siemens EXL platform in Central Zone with a change in methodology from "wet" to "dry" chemistry testing. Roll-out was coordinated and overseen by the South Sector chemistry and operational teams.



• Successful planning, installation, validation, training and implementation of Roche Cobas Pro instruments to replace Siemens Vista analyzers at Red Deer Regional Hospital and Chinook Regional Hospital. Further preparations and training continued with planned go-live at Medicine Hat Regional Hospital in early 2022. This new instrumentation allowed for the implementation of high-sensitivity Troponin T testing at these sites, improving cardiac patient pathways at these sites and their surrounding communities. Roll-out was coordinated and overseen by the South Sector chemistry and operational teams.

### **ConnectCare Preparations**

• Continued excellent progress on preparations for future South Sector ConnectCare launches, including ongoing work with training and supporting documents, PrePost analytics, I.T. system and interface testing, and Millennium interface work. Extensive planning and preparations for Launches 4 and 5 expected in 2022.

### **Other Activities and Successes**

- 20 AHS acute care laboratories in Central Zone underwent a highly successful CPSA Accreditation. Full accreditation achieved for all sites by the end of the year.
- Early planning and preparations began for CPSA Accreditation for Calgary Zone sites planned for 2022.
- After announcement of Dynalife Medical Labs as the successful proponent of the Community Laboratory Services RFP process, extensive work began in South Sector and provincially to prepare for the anticipated transition of testing in 2022. This included extensive data gathering, evaluation of lab testing volumes, instrumentation, personnel, budgeting and logistics. Special consideration has been given to evaluating the changes anticipated to rural and regional facilities.

### Challenges

- Continued impacts due to the COVID-19 pandemic that resulted in severe personnel and resource short-ages, particularly during the Alpha and Delta waves. Staff and processes were highly challenged but showed superb resilience and creative approaches to rotating losses of staffing, supplies, reagents, etc.
- Ongoing difficulties with unacceptable downtimes with Capillarys 3 instruments for HbA1c testing in Lethbridge and Red Deer required with eventual decommissioning of these instruments and change to alternative testing with re-routing of samples until capacity was achieved to repatriate testing in house.
- Ongoing difficulties with irregular stain quality noted with select Leica H&E strainers at labs in Calgary and Red Deer, requiring extensive troubleshooting and stain reagent changes that have stretched local resources.

### **Community Services**

### **Patient Service Centers**

### Good news

- The PSC MLA II, Regional Training Coordinator, was trained and certified in Non-Violent Crisis Intervention. All PSC staff members will be trained to give them the tools for creating a safer workplace as there has been a rise in patient incidents involving physical contact.
- PSC front line staff are active members of the APL Change Champions.

- With the number of pediatric collections increasing in the community, PSC front line staff promote Commitment to Comfort. The ACH outpatient lab is providing additional opportunities for job shadowing and training of PSC staff. Staff are scheduled bimonthly to go to ACH for extra tips and tricks with pediatric collections.
- Redeployed staff from the Covid testing lab utilized as screeners in the PSC.

### New things

- New buzzer system implemented at many PSCs (like restaurant pagers) allowing patients to wait in their cars for their appointment to ensure proper social distancing and ease patient's anxiety.
- "Coaches Corner" created. This is a monthly meeting with PSC coaches and a monthly newsletter to ensure students and new hires are being trained effectively.
- Implemented PSC N95 FIT testing.

### **Mobile Services**

### Good news:

- Introduced one consolidated APL Mobile Collection Services Requisition and retired the former AHS and CLS Mobile Collection Services Requisitions.
- Introduced process for PLC and other AHS clinics to email requisitions to the Mobile office instead of faxing, which reduces faxing and increases legibility of the requisitions. This is a more reliable process as it also eliminates potential problems with fax machines.
- Introduced process for weekend on call Pharmacists to email their short notice Mobile collection requests rather than faxing, as on call Pharmacists are usually working from their homes and do not have access to a fax machine.
- Introduced CheckMate Safe Alone App which is easier to use and less disruptive to Mobile staff than the previous CheckMate phone call system. This is used to monitor staff safety while they are working alone.
- Tsuut'ina Nation- increased Mobile Collection Service time from two hours to four hours once a week to improve the service to our Tsuut'ina clients.
- Stoney Nakoda Health Centre –provided temporary support twice a week for 3 months while they recruited and trained staff to complete phlebotomies. This meant their clients could continue to have their blood collected at their local Health Centre instead of being required to drive a significant distance to either Canmore or Calgary.
- Introduced monthly blood collection and ECG service for Calgary Police Service members to meet CPS OHW requirements.
- Simplified the process for tracking mileage for taxable benefit calculation for Mobile staff who take a fleet car home at the end of the day, by eliminating the personal tracking fob and using a single fob to track mileage. This simplified the process, increased the accuracy of the data and improved staff safety as some staff were previously required to transition between their work mileage fob and their personal fob while they were driving at the end of the workday.
- Installed ergonomic desks for the most of the MCS clerks to improve their work environment and reduce potential workplace injuries.
- Provided blood collection and ECGs service at Stampeders Training camp for rookies and returning players against the background of very tight Canadian Football League Covid 19 testing protocols and very controlled access to the players.
- Introduced Mobile Collection Services patient follow up survey which offers patients an opportunity to provide direct feedback and to monitor MLA compliance with MCS policies for quality assurance and continual improvement.

### Challenges:

- COVID-19 continued to be a significant challenge with ongoing considerable staff absences, and the ongoing inefficiency in the department due to delays related to Mobile staff screening at Congregate Care facilities and extra PPE requirements.
- ECG equipment was problematic with a significant number of repairs required. The process of sending the equipment to Edmonton for repair was cumbersome and slow. The process has been streamlined and the communication about problematic equipment has improved which has decreased the turnaround time for equipment repairs.
- APL Quality identified a problem within the Schiller software as it was missing some specific cardiac conditions.

- A complaint was made to Health Canada resulting in a mandatory software update. All 38 MCS laptops required the installation of this update to resolve the problem.
- University of Calgary parking policy changes at the DSC led to the requirement for paid parking permits for fleet vehicles. This has increased the cost to the MCS department to have fleet cars parked on site at the DSC.

### Logistics

- The APL couriers became unionized with CUPE Local 8 certified on May 13, 2019. On June 11, 2021, the first collective agreement for drivers was ratified. The APL Logistics department has employees under two unions: Dispatchers and Office staff under HSAA and the drivers with CUPE.
- New Employee Management Advisory Committee (EMAC) established with CUPE, drivers, and APL leadership representatives.
- Adjustments to existing routes were made to meet requirements of CUPE Collective Agreement.
- Recruitment and retention of staff continued to be a challenge for 2021.
- Throughout the year, adjustments to assessment center routes continued due to COVID testing load balancing.

### **APL Client Response**

### **Provincial & Calgary zone Patient Appointments**

Appointments were available for 130 APL hospital and collection sites with a utilization rate of 170,000+ per month. Calgary zone provided an option for health care providers to book "time sensitive appointments" for patients requiring lab results for upcoming medical treatments such day surgery.

### Calgary Zone Lab Information Centre (LIC) & Client Interface Team (CIT)

These two teams provided support for APL Public Health labs by fielding phone calls/ emails from Medical Officers of Health, Assessment Centre, and contact tracers requiring Covid test results, patient overlays and patient demographic errors requiring correction. During the Covid pandemic CIT completed 3500 access requests for Covid results for travelers & workers. LIC called 50,000 positive/ critical Covid results to Calgary zone acute care inpatients.

### Provincial Data Integrity (Connect Care, Millennium, Meditech)

In 2021 the Millennium data integrity team investigated and resolved 266 patient overlays. Both Connect Care and Millennium teams were challenged with significant backlogs for "temporary physicians", "Unknown provider" and "unknown submitter" corrections. In March 2022 there was a back log of 4401 "temporary physicians" requiring corrections. Backlogs were resolved in July 2022.

### **Microbiology**

### **Maturation: COVID-19 Testing**

After its inception in May 2020, the COVID-19 testing laboratory at South Health Campus (SHC) matured into one of the main testing sites for Alberta. 2021 saw the site undergo renovations and add automated instrumentation in order to continue to mark gains in capacity, throughput, and quality. Challenges were constant: the first major variants were seen at the beginning of 2021, presaging wave after wave triggering by new variants, and increasing virulence and transmission. Supply chain issues, labour shortages, and staff turnover beset the laboratory sector as they did the rest of the economy.

Testing demand was volatile in the extreme – incredibly high during waves, and quiet between ways, and complicated because no one could predict if and when the next wave would come.

Nonetheless, the site continued to be a leader in COVID-19 testing in the province, contributing to APL's provincial leadership in COVID-19 testing.

Over 950,000 tests were performed and reported in 2021, the most of any site, accompanied by quick and reliable turnaround times: once received in the laboratory, 88% of tests were reported within 12 hours, and 99% of tests within 24 hours.

...the site continued to

be a leader in COVID-19

testing in the province...

Similarly, the microbiology laboratory at the Diagnostic & Scientific Centre (DSC) was able to mature its rapid COVID-19 PCR testing for acute care sites in Calgary. Overcoming supply chain issues, the site verified multiple rapid testing plat-forms, and was able to use a combination to test 78,000 specimens of symptomatic acute care patients, with >90% of results available within 5 hours of receipt at the testing laboratory, no matter the day or time of collection.

### **Preparation: Things To Come**

### Group A Streptococcus (GAS) Testing

For years, group A streptococcal testing in Calgary Zone has been a leader in the province, using DNA probe technology to provide quick test results that can provide actionable results to guide clinician decision-making in starting antibiotics. With the previous platform being discontinued by the manufacturer, a laboratory-developed test to detect group A streptococci from throat swabs was developed with loop-mediated isothermal amplification (LAMP) technology. Efforts resulted in a sensitive assay using an automated platform to continue to provide high-quality and rapid results, ready for implementation in 2022.

### ConnectCare

With the devotion of resources, including IT, to COVID-19 testing throughout 2020, the launch of ConnectCare was delayed in several sites, including in southern Alberta. With launches rescheduled for 2022, microbiology personnel used this time to build, validate, and further prepare for this fundamental change to laboratory testing.

### Request for Proposal (RFP) for Community Testing

APL's RFP for community testing continued in 2021, with both acute care and community microbiology testing in Calgary considered in-scope for this transition. With more details to come in 2022, the laboratory began taking stock and preparing for the coming transition, including securing supply chains, optimizing testing, and continuing to train and develop its staff, both in its routine microbiology laboratory and COVID-19 testing laboratory sites.

### Hematopathology

Annual Report – Clinical Section of Hematopathology APL-South

In 2021-2022, Clinical section of hematopathology APL-South has been closely involved with the planning and transitioning of community laboratory services to Dynalife.

In addition, with endless efforts of operational, scientific and medical staff, hematology operation including general hospital labs as well as esoteric labs have been unconditionally accredited for the next four years.

Aligned with new APL organizational restructuring, Human Immunogenetic Lab (HLA Lab) and Molecular hematology Lab (MolHem) have been transferred from Clinical Section of Hematology to newly formed provincial programs; Provincial Transfusion and Transplantation Medicine (TTM) and Provincial Molecular Pathology Programs, respectively.

Clinical Section of Hematopathology-APL-South has encountered with 20% increase in the number of Bone Marrow and Lymphoma cases mostly related to increased post-COVID turnover of patients at clinical side. Despite manpower shortage, all these cases have been handled with proper TATs and all necessary ancillary molecular and genomic studies have been competed for the patients in collaboration with APL's other labs.

In collaboration with AHS Cancer Strategic Clinical Network and full support of APL leadership, Lymphoma Pathway project has been implemented province wide. This initiative has helped to establish a fast-track process for the diagnosis and management of patients with clinical diagnosis of lymphoma. Hempaths' specialized teams as well as Dr. Etienne Mahe, Lead for clinical informatics APL-South has been heavily involved in designing laboratory protocols, implementation and the launch of Connect Care project which provides infrastructure for provincial clinical information system.

Flow cytometry Lab at FMC which provides flow services for CZ, central zone and South Alberta, has been equipped by three state of art, new 13 colour Dx Flex flow cytometry equipment which have been already installed and currently getting validated to provide sophisticated immunophenotypic services in the future.

On Academic side, Dr. Tariq Roshan has been appointed as new program coordinator for hematopathology training/Fellowship program and is working towards expansion and improvement of teaching programs. Dr. Etienne Mahe continues to run the BIOL515 course as a part of undergrad program.

On the research side, in post-COVID area, the divisional research activities has been started to speed-up and the members of hempath group has published 4 peer reviewed articles and presented 6 abstracts in national and international conferences.

### **Transfusion Medicine**

This report is retrospectively reporting back to September 2021.

### Milestones 2021:

September 1, 2021 - Stock albumin was removed from off site dialysis units.

September 2021 – A new CBS product, Haegarda (C1 Esterase Inhibitor) was introduced for the treatment of Hereditary Angioedema

October 1, 2022 - Maternal antibody screen history is now required within the last 9 months. This provides provincial standardization when performing fetal maternal antibody investigations.

November 15th, 2021 - Vitamin K will no longer be sent with Prothrombin Complex Concentrates (PCC), it is now obtained from the pharmacy.

November 15th, 2021 - Cords will now be forwarded to FMC from HRH & Canmore to improve TAT for DATN.

Feb. 14, 2022 - Implementation and provincial roll out of Ortho testing platform (13 sites) began. Calgary Zone would go first due to the current automation had been sunsetted in 2019 and has limited technical support and parts available. The first analyzer was received at SHC followed by RGH, PLC and FMC. ACH, due to testing volumes, would use the manual work-station that also supports gel technology. On July 21, 2022 all Calgary Zone acute care sites were live on the new analyzers.

March 1, 2022 - Seven (7) Haemonetic refrigerators were delivered to FMC (5) and PLC (2). These fridges were purchased

in response to a 2018 Health Canada citation. Implementation of the fridges would allow for the traceability of red cells that left the Transfusion Department and were returned later to be placed back into inventory. The traceability would capture the storage of the red cells and ensure they were in acceptable storage conditions before being placed back into inventory. The first fridge went live in the FMC Emergency department on August 30, 2022.

March 15, 2022 – Transfusion and Transplantation Medicine Program (TTM) Strategic Planning meetings began for the operational and medical leaders. The meetings occurred every 2 weeks for 6 sessions. The intent was to define the framework of the program and identify a value proposition statement for the program. Membership has expanded to include further stakeholders to begin steering committee meetings in the fall.



April 21, 2022 – The policy for Communicating Critical Alert Values was updated. This provides standardization across the province. The following critical values were added;

- Results indicative of HDFN. If an antibody capable of causing HDFN is identified on a neonate, the physician looking after the baby must be informed as they may not be aware that the mother has an antibody. Call to inform NICU
- Discovery of an error or accident with a blood component that has the potential to impact patient care. Notify the TM Physician ASAP.

May 3, 2022 – Changes with Neonatal rede cell and platelet transfusions were implemented to align with the new National Advisory Committee (NAC) and provincial recommendations.

May 13, 2022 – The policy for Determining Patient's Eligibility for Blood Components and Blood Products was updated and now the aligns transfusion practices across the province.

May 25, 2022 – all Calgary Acute care sites that plasma inventory levels would be updated to include FP (250ml) only with the discontinued production of apheresis FFP at CBS.

May 28, 2022 – EPIC Launch 4 occurred in Calgary Zone including ACH, PLC & Calgary Rural sites. This now puts Calgary Zone labs in an interim state. FMC will now see referral testing from sites that are live on EPIC.

June 6-9th – CPSA accreditation was held. Transfusion Medicine received accolades for their staff training program. Transfusion Medicine did receive a citation at ACH for TM staffing levels and competence.

June 16, 2022 – Cryoprecipitate will no longer be stocked at the Calgary adult acute care sites. There has not been any adult transfusions of this blood product in the last few years. A minimum stock will be kept at the Alberta Children's Hospital to support current transfusion practices.

Continued meetings occurring for Launch 5 interim state for FMC, Launch 5 in Central Zone (DTH) and Launch 6 APL labs in Calgary Zone.

### **Future Plans**

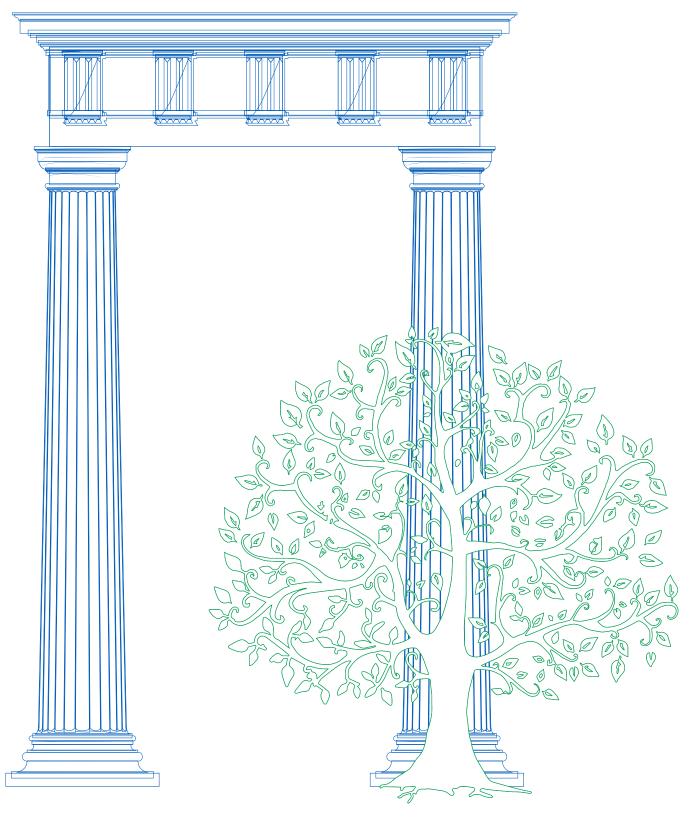
- Ongoing strategic planning for the Transfusion and Transplantation Medicine program
- Continued roll out of the Ortho testing platform across the province (Edmonton Zone to go live in October at UAH)
- Launch 5 EPIC go live for FMC, Alberta Cancer Care and Alberta Kidney on November 5th, 2022
- Haemonetic fridges to go live in the two PLC operating rooms on Nov. 30, 2022
- Health Canada inspection at FMC Nov. 21 25th, 2022
- The remaining four (4) Haemonetic fridges are projected to go live in January 2023. This includes the three operating rooms in the main FMC hospital and NU94 (cardiac ICU).
- Continued readiness activities for the opening of the Calgary Cancer Centre. Projected transition dates for APL to begin equipment validation in January 2023 with a projected opening in May 2023.
- Launch 6 go live in Calgary Zone for APL labs is May 6th, 2023

### **Arrivals and Departures**

We wish Dr Maire Duggan and Dr. Leslie Eidus a happy retirement as of December 2021. Dr. Duggan will continue as Emerita Faculty and Dr. Eidus as an Honorary Member.

We also welcome Dr. Lisa Wilkinson from Australia who joined the Anatomic Pathology team at Peter Lougheed Centre.

### **Education Programs**



### **Anatomical Residency Training Program**

### **Program Structure:**

This is a five-year program leading to certification in Anatomical Pathology by the Royal College of Physicians and Surgeons of Canada. Our program transitioned to Competency By Design (CBD) in July 2019, and we currently have a mix of CBD residents and traditional stream residents. The curriculum includes orientation, clinical rotations, core adult surgical and autopsy pathology rotations, subspecialty rotations, elective rotations, research, and 3-4 months of chief resident service. The curriculum is designed to give graded responsibility to residents. In the final year of training, residents are expected to perform at the level of a fellow or junior faculty member, recognizing that faculty-resident supervision is always occurring. In 2021 we welcomed five new residents, including three PGY1 Canadian medical graduates, one

PGY1 international medical graduate, and one PGY2 transfer resident. We currently have 18 residents in our program. Administrative support and training facilities are provided by the University of Calgary's Department of Pathology and Laboratory Medicine.

# A philosophy of independent self-directed learning underlies the program.

**Teaching:** A philosophy of independent self-directed learning underlies the program. Teaching takes place via a combination of dedicated educational events, group learning and one-on-one teaching. Structured educational events include departmental Continuing Medical Education rounds, resident-led Gross Pathology rounds, optional evening slide sessions, and a dedicated weekly academic half day consisting of unknown slide rounds, autopsy rounds, and didactic teaching. Due to the COVID-19 pandemic, most of our educational activities are now offered virtually via Zoom, which has made it easier for trainees to attend even when they are rotating off-site. Residents are also expected to read and study independently.

**Evaluation:** Traditional stream residents are assessed via in-training evaluation reports (ITERs), and CBD residents are assessed based on their achievement of Entrustable Professional Activities (EPAs). Several rotations incorporate end-of-rotation slide exams or presentations into their assessments. PGY2-PGY5 residents are also assessed via biannual exams, including a full RCPSC-style examination each winter and spring, and the American Society of Clinical Pathology Resident In–Service Exam (RISE) each spring. Additional examinations are offered for residents in difficulty and for senior residents preparing for the Royal College examination. The program director meets with each resident at least twice yearly to discuss the resident's academic progress, research projects, subspecialty interests, and fellowship/career plans.

**Research:** Involvement in research activities is an integral part of the program. Beginning in the PGY2 year, residents undertake one or more research projects with the advice and mentor-ship of the Resident Research Advisor. Residents present their research findings at the annual departmental research day, as well as at national and international meetings. During 2021, University of Calgary Anatomical Pathology residents and recent graduates co-authored 29 peer-reviewed scientific publications.

**Resident progress and news:** Our program graduated four residents in 2021, three of whom went on to complete subspecialty fellowships (Breast Pathology at Memorial Sloan-Kettering Cancer Center, Pediatric Pathology at Harvard / Boston Children's Hospital, and Renal Pathology at Cedars-Sinai Medical Center). Of our 2021 graduates, two are employed in our department (one at FMC and one at RGH), one is on staff at the University of Alberta, and one was hired by Harvard / Boston Children's Hospital (Boston, MA, USA). The University of Calgary's Anatomical Pathology residency program is well-regarded nationally, and receives a large number of applicants for the annual CaRMS match. In 2021 we filled all four CaRMS positions with outstanding applicants.

**Program accreditation and upcoming changes:** The Anatomical Pathology residency program received full accreditation by the Royal College of Physicians and Surgeons of Canada following an External Review in 2015. Our program underwent a mid-cycle internal review in October 2020. This review went very well and no deficiencies were noted. Our next formal Royal College external accreditation review is scheduled for September 2022. Our program's greatest challenges include navigating changes related to the COVID-19 pandemic, managing our ongoing transition to Competency By Design (CBD), and ensuring a stable and supportive training environment for our residents despite ongoing changes and uncertainties in healthcare provision at the provincial level.

### **Members:**

Anatomic Pathology Residency Training Committee

- Dr. Carolin Teman, Program Director
- Dr. Adrian Box
- Dr. Amy Bromley, CBME Lead
- Dr. Asli Yilmaz
- Dr. Charlene Hunter
- Dr. Akmal Coetzee-Khan
- Dr. Jenika Howell
- Dr. Karen Naert
- Dr. Karim Khetani
- Dr. Kate O'Connor, July 1, 2021 onwards
- Dr. Konstantin Koro
- Dr. Kyle Kurek
- Dr. Mara Caragea
- Dr. Martin Hyrcza
- Dr. Marie Dvorakova
- Dr. Nicole Bures
- Dr. Margaret Kelly
- Dr. Sandra Lee
- Dr. Tariq Roshan, July 1, 2021 onwards
- Dr. Travis Ogilvie
- Dr. Davinder Sidhu
- Dr. Amy Thommasen
- Dr. Denise Ng
- Dr. Hallgrimur Benediktsson, (Dept Head corresponding)
- Dr. Dylan Pillai, (Dept Head corresponding, May 1, 2021 onwards)
- AP Junior Resident, rotates
- AP Chief Resident, rotates
- GP Chief Resident, rotates
- GP Junior Resident, rotates

### **General Pathology Program**

### The General Pathology Program

Our program is a five-year program leading to certification in General Pathology by the Royal College of Physicians and Surgeons of Canada. The University of Calgary through co-sponsorship with Calgary Laboratory Services offer General Pathology Residency Training highlighting on laboratory management and pathology informatics. The General Pathology Residency Program includes approximately 4 plus years of laboratory medicine and multiple clinical training experiences. The clinical training is optimized to provide exposure to most of the medical and surgical services that rely heavily on the clinical and anatomical pathology laboratory. Upon successful completion of the education program, the residents will be competent to function as consultants in General Pathology and medical laboratory directors.

### Competency by Design:

Since 2019 the General Pathology program has continued to implement the new Royal College mandated Competency By Design (CBD) initiative for General Pathology evaluation and feedback. A Competency Committee, a subcommittee of the Residency Training Committee, oversees resident evaluation, promotion, and curriculum development within the CBD curriculum. A total of 6 residents are currently enrolled in the General Pathology CBD curriculum and have successfully completed multiple stages of training, with all residents on track with expected progression through the curriculum. In addition to the CBD residents, we have 3 legacy traditional stream residents continuing to progress through those training channels.



One important change within the CBD curriculum is that the Royal College certifying examination was moved from PGY5 to PGY4 to allow a period of transition to practice. This coming academic year will see the first cohort of General Pathology CBD residents participate in the Royal College certifying exam. Modification to the curriculum continues to be adjusted and improved with collaboration from residency training leadership in medical microbiology, hematopathology, anatomical pathology, and clinical chemistry to ensure core curriculum material is covered prior to the examination. The basic clinical rotations have been consolidated and modified to include disciplines more directly applicable to general pathology practice and will allow residents additional time within laboratory medicine training. We have also introduced new training opportunities including procedure simulation sessions with the Cumming School of Medicine Advanced Technical Skills Simulation Laboratory.

### **Current Program**

Our program has successfully graduated every general pathology resident that has applied to the Royal College Examination, all of whom have successfully passed the General Pathology certification exams by the Royal College of Physicians and Surgeons of Canada.

Successful on-site Royal College accreditation survey/review of the University of Calgary's General Pathology Residency Training Program took place on September 20, 2022, with no major deficiencies noted. The program was given accreditation with regular review in 5 years. We currently have 9 residents in the program and continue to deal with and overcome the current challenges of the ongoing laboratory transition as they relate to effective and safe resident education.

Members	Major Site Affiliation	Major Function with the program	
Dr. Davinder Sidhu (Chair)	Foothills Medical Centre	Program Director	
Dr. Dylan Pillai	Diagnostic and Scientific Centre	Department Head	
Dr. Christopher Naugler	Diagnostic and Scientific Centre	General Pathology and Associate Dean, Undergraduate Medical Education	
Dr. Amy Bromley	Foothills Medical Centre	Director of Education.	
Dr. Marie Dvorakova	Diagnostic and Scientific Centre	Coordination of DSC site training	
Dr. Julie Carson	Diagnostic and Scientific Centre	Coordination of Medical Microbiology training	
Dr. Tariq Roshan	Foothills Medical Centre	Coordination of Hematological Pathology training	
Dr. Carolin Teman	Foothills Medical Centre	Coordination of Anatomic Pathology training	
Dr. Jessica Gifford	Diagnostic and Scientific Centre	Coordination of Medical Biochemistry training	
Dr. Robby Wang	Red Deer Hospital	Coordination Red Deer Hospital training	
Dr. Ryan Lenz Chief Resident Junior Resident	Rockyview General Hospital	Corresponding member PGY-1 site representative Rotating (5-6 months) Rotating (5-6 months)	

### Medical Microbiology Residency Program

### Medical Microbiology Residency Program Committee

- Dr. Julie Carson, Program Director
- Dr. Luiz Lisboa
- Dr. Michael Groeschel
- Dr. Hong Yuan Zhou
- Dr. Dan Gregson
- Dr. Stephen Vaughan
- Dr. Taj Jadaviji
- Dr. Joseph Kim
- Dr. Helen Bibby, chief resident, PGY5
- Dr. Amy Bromley, ex-officio/corresponding
- Dr. Dylan Pillai, Dept Head, corresponding
- Dr. Dave Sidhu, General Pathology Program Director, Corresponding

### Medical Microbiology Residency Training Program

The Medical Microbiology residency training program at the University of Calgary is a five-year program that aims to train medical microbiologists to be competent and confident practitioners.

The program's training is focused at developing expertise and skills in the four major spheres of medical microbiology as outlined by the Royal College of Physicians and Surgeons of Canada: the medical, scientific, administrative direction and management of a clinical diagnostic laboratory; the provision of clinical consultation in infectious diseases; infection control and antimicrobial stewardship; and public health.

In 2021-2022 academic year, the Medical Microbiology program had three residents – PGY1, PGY2 and PGY4 level of training.

The Medical Microbiology residency program was fully accredited by the Royal College of Physicians and Surgeons of Canada in 2015 at its inception. The internal review in September 2020 was successful and

a good experience to help to prepare for the program's first external Royal College review coming up in September 2022.

The specialty of Medical Microbiology's tentative implementation date for Competency by Design is July 2024. Pre-launch activities for the program and faculty will start in early 2023.

### **Training Overview**

The PGY-1 year provides an experience akin to the rotating internship, with rotations in a variety of related clinical disciplines to supplement the clinical knowledge and skill set of the trainee.

PGY years 2 through 5 involve a mix of rotations to meet the specialty training requirements. Diagnostic laboratory rotations (up to 22 four-week blocks) focus on bacteriology, virology, mycology, parasitology, and public health microbiology. Clinical infectious diseases rotations (13 four-week blocks), include both adult and pediatric, inpatient and outpatient services. The infection control and antimicrobial stewardship blocks (3 four-week blocks) are shared with the Infectious Disease programs. There is a significant amount of elective time (up to 13 four-week blocks) included to allow trainees to further develop in sub-specialties and research of their choosing.

The Medical Microbiology Program has three major laboratory training sites. The Diagnostic Scientific Center is the primary site for bacteriology, mycology, parasitology, and molecular training and where residents have the majority of their core laboratory training. The Public Health Lab – South (Calgary) location is the primary training site for virology, serology, molecular and public health lab microbiology. Our program has an inter-university agreement with University

The Medical Microbiology Program has three major laboratory training sites. of Alberta whereby our residents have one mandatory rotation at the Public Health Lab – North (Edmonton)/University of Alberta Hospital Laboratory to meet their mycobacteriology, containment level three and bacterial typing objectives.

Our residents also have opportunities in their Community Microbiology block to engage with our Microbiologists and technical teams (in person and remotely) in the regional centers microbiology laboratories – Red Deer Regional Hospital, Chinook Regional Hospital (Lethbridge) and Medicine Hat Regional Hospital.

Our clinical sites for training in Infectious Disease include all the major hospitals in Calgary: Foothills Medical Center, Peter Lougheed Center, Rockyview General Hospital, South Health Campus Hospital and the Alberta Children's Hospital as well as the Sheldon M. Chumir Health Centre for several public health related outpatient clinics.

Our program also supports the training of Infectious Disease Residents (12 weeks) and General Pathology Residents (24 weeks) and electives for these programs. We collaborate closely with our Infectious Disease programs with respect to shared curricula in Infection Control and Stewardship as well as our academic half day content.

### Research

Medical Microbiology residents are expected to complete at least one research project during their residency. Our residents have been involved in several research projects, contributing to publications and presentations at local, national and international meetings in the last year.

### **Neuropathology Residency**

Program Director: Dr. Denise Ng

### **Program Structure:**

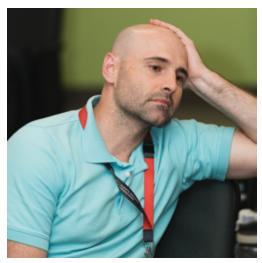
This is a five-year post-graduate training program leading to certification in Neuropathology by the Royal College of Physicians and Surgeons of Canada. The traditional stream of training includes one year of clinical medicine, one year of anatomic pathology and three years of neuropathology training, including two core years with graded responsibility in the reporting of adult and pediatric surgical and autopsy cases, including intraoperative consultations, neuromuscular pathology, and a longitudinal forensic neuropathology experience. The fifth year is a year with flexibility for further training in neuropathology and/or other pathology sub-specialties, elective, clinical rotations, or research. Transition to Competency by Design is expected to commence with the next incoming resident as early as 2023.

### **Teaching and Education**

Resident learning in the program occurs through multiple modalities including case-based teaching at the microscope

during neuropathology service, formal didactics and interactive sessions during academic half day, continuing medical education rounds, and participation in the DPLM Resident Shared Laboratory Management Seminar Series. Interdisciplinary rounds are an opportunity for residents to learn and to teach in collaboration with our neuroscience colleagues in neurology, neurosurgery, neuro-oncology, pediatrics, and medical genetics. Regularly occurring rounds involve active preparation of materials and/or teaching for adult and pediatric brain tumor board, neuromuscular rounds, pituitary rounds, and maternal fetal medicine rounds.

The residents and faculty in the neuropathology program are also heavily involved in the teaching of other residents from other specialties and medical students. Visiting resident rotators are a near constant on the neuropathology service. Two residency programs have mandatory training experiences in neuropathology, Neurosurgery and Anatomic Pathology. Elective rotat-



ing residents from the programs of Adult and Pediatric Neurology, General Pathology, Neuroradiology and Radiation Oncology are also frequent. These interactions allow our program to extend collaborative relationships with clinical programs and other laboratory medicine programs as well as participate in quality assurance processes and improve communication skills.

### **Evaluation**

The residents currently in the program are traditional stream residents who are evaluated using rotation-based in-training-evaluation-reports (ITERs) based upon goals and objectives of the rotation, multi-source feedback forms, and examinations twice a year. Quarterly meetings with the program director discuss training progress and goals that may include research and career planning. Preparations for CBD residents have included professional development for our neuropathology staff, who already have been participating in the new feedback and evaluation methods for CBD residents rotating from other specialties.

### Research

Ongoing participation in research activities is encouraged throughout residency training, and there are ample local research opportunities into neuro-degenerative disorders, neuro-oncology, neuro-regeneration, cerebral ischemia, and developmental disorders. Residents have also taken advantage of research opportunities in other areas of Canada and abroad. Trainees gain experience in the application of new technologies in the study of the pathogenesis of disease including immunodiagnostics, molecular pathology, cytogenetics, and electron microscopy.

There is much excitement around the creation by Dr. Dylan Pillai and M. Hyrcza with the de of the Trainee-Led Projects Support Initiative that will be provide much needed funding for resident projects.

### **Resident progress and News**

The University of Calgary Neuropathology Residency Program continues to be one of the largest active neuropathology training programs across Canada. In the 2022-2023 academic year, we have three residents in the program. We have most recently welcomed a new PGY1 resident Dr. Erin Stephenson from the University of Calgary.

The University of Calgary neuropathology program is transitioning to Competency by Design as early as 2023 with the next incoming resident.

### Program accreditation upcoming changes:

The program was recently given full accreditation by the Royal College in the internal review in 2018. We completed the Mid-Cycle Internal Review March 2020, prompting more improvements in the creation of a dedicated longitudinal forensic neuropathology experience in collaboration with the Office of the Chief Medical Examiner and addition of more feedback modalities for our residents. More reflection and work has been underway in preparation for the University of Calgary External Review in September 2022. We hope this review to be smooth as we continue to make improvements in our training program. We look forward to introducing new residents in training under the CBD curriculum.

### **Neuropathology Residency Training Committee**

- Dr. Denise Ng, Program Director
- Dr. Kristopher Langdon
- Dr. Jeffrey Joseph
- Dr. Jennifer Chan
- Dr. Ana Nikolic
- Dr. Akmal Coetzee-Khan
- Dr. Marie-Anne Brundler

- Dr. Carolin Teman, ex-officio
- Dr. Amy Bromley, ex-officio
- Dr. Davinder Sidhu, ex-officio
- Dr. Hallgrimur Benediktsson, corresponding
- Chief Resident, residents' representative

### **Undergraduate Medical Education**

Department Representative: Dr. Amy Bromley

The University of Calgary Undergraduate Medical Education program follows an integrated approach to meet the requirements of the Medical Council of Canada. As such, pathology, microbiology, and clinical chemistry are currently integrated into the systems-based courses in the curriculum, which include hematology, gastroenterology, cardiology, respirology, nephrology, endocrinology, neurology, gynecology, and pediatrics. Students are exposed to laboratory test utilization and interpretation. The lab medicine content is taught through multiple modalities, including lectures, asynchronous learning events, flipped classroom, small group sessions, and clinicopathological correlation sessions where lab physicians partner with clinicians and other diagnosticians to present cases as they would present in real clinical life.

In addition to the systems-based curriculum, the Department has taken advantage of other opportunities to expose students to careers in laboratory medicine. Our members are preceptors for the Applied Evidence Based Medicine course, as well as pre-clerkship and clerkship electives. Additionally, many of our members participate in the Career Exploration Program, which involves shadowing interactions for direct observation of practice, as well as career coaching to help medical students navigate the pre-CaRMS landscape to inform residency choices in the future.

Stay tuned for the reports for the next few years as exciting times are ahead at the Undergraduate Medical Education level. The new co-designed, spiral delivery of a patient-centered, clinical presentation-based curriculum, RIME, rolls out in July 2023.

### **Fellowship Programs**

### Chair: Dr. Jeffrey Joseph)

Up to eight internally (APL) funded positions are available each year. Five of these positions are meant to fund board-certified (or board-eligible) Anatomic Pathology Fellows wanting to develop subspecialty skills in an area of Anatomic Pathology. In some years, we also train externally funded/sponsored fellows.

The DPLM/APL Fellowship Committee selects qualified applicants for internally and externally funded Fellowship positions.

Positions are open to either MD or PhD applicants, depending upon the field of study.

We await the final submission of paperwork from Dr. Bromley for a Hospital Autopsy Fellowship.



An Area of Focused Competence (Diploma), or AFC (Diploma), is a highly specialized discipline of specialty medicine that addresses a legitimate societal need but does not meet the Royal College criteria for a specialty, foundation program or subspecialty.

Physicians who have successfully completed all the requirements and who annually maintain their status as a Diplomate of the Royal College receive an added qualification known as a Diploma of the Royal College of Physicians and Surgeons of Canada, or DRCPSC.

List of active DPLM Fellowship programs in 2021:

### PhD:

- 1. Clinical BioChemistry
- 2. Histocompatibility

### MD:

- 1. Breast Pathology
- 2. Cytopathology Area of Focused Competence
- 3. Dermatopathology
- 4. Gastrointestinal Pathology
- 5. Gynecological Pathology
- 6. Hematopathology
- 7. Pediatric Pathology
- 8. Pulmonary Pathology
- 9. Renal/Transplant Pathology
- 10. Uropathology

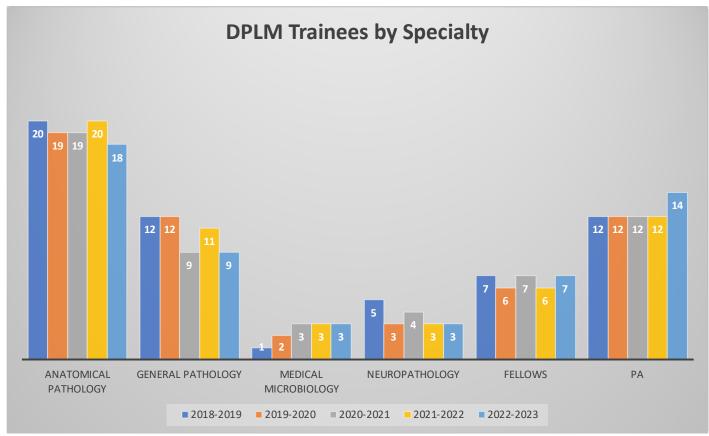
Filled Fellowship positions for Academic year 2020/2021

- 1. 2 PhD Clinical Biochemistry Fellows
- 2. 1 PhD Histocompatibility Fellow
- 3. 4 MD Fellows in the following sub-specialties
  - Cytopathology AFC
  - Dermatopathology
  - Hematopathology
  - Breast Pathology



Filled fellowship positions for Academic Year 2021/2022

- 1. 2 PhD Clinical Biochemistry Fellows
- 2. 1 PhD Histocompatibility Fellow
- 3. 3 MD Fellows in the following sub-specialties
  - Breast Pathology
  - Gynecological Pathology
  - Uropathology



### **Master of Pathologists' Assistant Program**

Program Director, Bill Gorday, Medical Director, Jim Wright (2021), Travis Ogilvie (2022).

Pathologists' Assistants (PAs) are "physician extenders" for anatomic pathologists. PAs perform delegated medical tasks under the supervision of a medically qualified pathologist. They perform initial examination, dissection, and gross description of surgically removed tissues, assist in dissection of bodies during autopsies, and perform intraoperative frozen sections. They possess a highly standardized skill set related to each of these procedures, allowing pathologists to spend more of their time looking at slides and performing diagnostic work.

### **History and Program Structure**

- The thesis-based Pathologists' Assistants (PA) Masters program at the University of Calgary began in 2012 as a specialization within Medical Sciences Graduate studies and in 2016 transitioned to a course based Masters program under Graduate Science Education at the Cumming School of Medicine.
- The Master of Pathologists' Assistant program is a twenty-one month continuous (not including holidays) coursebased master program that includes traditional didactic courses with interactive class work, practicum courses and a research project course.
- 1st year course topics include physiology, human anatomy, pathology, histology, medical terminology, medical ethics and introductions to surgical and autopsy pathology.

- 2nd year practicum training (13 months continuous) includes rotations through various clinical sites covering adult surgical pathology, pediatric surgical pathology, medical and forensic autopsy.
- Over the years the research projects course has resulted in students and staff publishing in various peer reviewed journals, led to changes in APL standard operating procedures, created curricular content and influenced changes to the curricular design of the program
- The program supports all 2nd year PA students to attend either the Canadian or US Pathologists' Assistant conference with the expectation that they will present a poster at the conference. The program is also asked to name two student delegates each year to represent the University of Calgary at the American Association of Pathologists' Assistants (AAPA) conference. The delegates are required to write a manuscript for publication consideration in the AAPA journal "The Cutting Edge".
- 2nd year PA students are expected to present at the monthly APL PA rounds which are broadcast across Canada via zoom.

### **Program Accreditation**

The PA program is accredited by The National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), an American agency that accredits training programs of allied health professionals who work in anatomic pathology or clinical pathology laboratories. The PA program's 5-year NAACLS accreditation was up for renewal in April, 2019. On April 29th and 30th, 2019, we had the NAACLS site visit and were formally awarded accreditation on October 31st, 2019, for another 5-year cycle. Accreditation of the program is a huge benefit to our students, as it makes them eligible to write the American Society of Clinical Pathology board certification exam and Canadian Certification Council of Pathologists' Assistants exam, which allows them to work anywhere in North America.

### **Program Statistics**

- 2021 Program Statistics- Graduation rate 100%, Attrition rate 0%, Employment rate 100%, CCCPA-CCCAP exam pass rate 100%. Exam pass rates are based on eligible graduates who wrote the exam within one year of graduation.
  - Students have found employment within the provinces of Alberta, British Columbia, Saskatchewan, Nova Scotia and Ontario.
  - One of our 2021 graduates (Nadia Mohammad Sharif) won the AAPA Educational Scholarship and had their winning manuscript published in the AAPA journal "The Cutting Edge" Sharif N. A Review of COVID-19 Pandemic-Driven Precautionary Adaptations in Biosafety Risk Management for Integration into the Pathologists' Assistant Profession. The Cutting Edge. Volume 11, Issue 3, 2021
- Since 2016 the program has admitted six students a year. For the 2021 and 2022 cohort we will be accepting eight students with two students doing a portion of their practical training in Saskatoon and Regina.

### **Program Affiliations**

- The program has practical affiliations with APL, Medical Examiner's Office (Calgary), Vancouver General Hospital, BC Children's Hospital and the University of Saskatchewan College of Medicine.
  - Affiliation agreements with BC Children's Hospital and the University of Saskatchewan College of Medicine were signed in 2019.
  - We have partnered with Saskatchewan Health Authority and will be sending two students in 2022-2023 to complete a portion of their practical training in Regina and Saskatoon.
  - We continue to work with Vancouver General Hospital and BC Children's Hospital to establish optional practicum rotations for students at these sites.



### **Research Day**

The 2021 DPLM Research Day took place on June 10th, 2021, in an on-line format due to pandemic restrictions. It demonstrated that despite the challenges of the pandemic, our residents, students, and staff have continued to ask questions, design research strategies to answer them, and generate knowledge that has potential to advance and inform the pathology of the future. The Paul Kneafsey Memorial Lecture was delivered by the department's own Dr Jennifer Chan.

Seventeen presentations were delivered by thirteen trainees. The quality and the breadth of the presentations was high, and the judges (Drs. Margaret Kelly, Lawrence de Koning, and Thomas Brenn) had a difficult task of selecting the winners. Separate awards were presented for clinical and anatomical pathology projects with three prizes awarded in each category.

## The quality and the breadth of the presentations was high...

In the Clinical Pathology category, the 1st prize (\$500) went to Dr Helen Bibby for a presentation entitled "A Pragmatic Randomized Controlled Trial of Rapid Influenza/RSV PCR Testing in Pediatric and Adult Populations". The 2nd prize (\$250) went to Dr Thane Kubik for his presentation on "A Systematic Assessment of Laboratory Parameters in SARS-CoV-2 Infected Patients". The Honorable Mention (\$100) went to Dr Cody Lewis for "Investigating the Impact of Rheumatoid Factor on Vancomycin Measurement in Serum Separator Tubes by Roche Diagnostics Kinetic Interaction of Microparticles in Solution Assay".

In the Anatomical Pathology category, the 1st prize (\$500) went to Dr Ksenia Chezar for her presentation "Serrated Polyps of the Appendix are Distinct from their Right-sided Colonic Counterparts and may Serve as Precursor Lesions for Appendiceal Mucinous Neoplasms. The 2nd prize (\$250) went to Dr Austin Laing for "Evaluation of Surgical Pathology Subspecialized Practice at Foothills Medical Centre". And the Honorable Mention (\$100) was awarded to Dr Eun-Young Kang for her talk entitled "MCM3 is a Novel Proliferation Marker Predictive of Treatment Response in Turbo-ovarian High-Grade Serous Carcinoma". Congratulations to all the winners of the prizes!

### **SHC Lab Contributions**

2021 brought about yet new challenges to the provision of community diagnostic SARS-CoV-2 testing in Alberta. The variants of concern Alpha (B.1.1.7), Delta (B.1.617.2), and Omicron (B.1.1.529) led to successive waves of transmission of infection with consequent unprecedented pressure over our healthcare system and its SARS-CoV-2 diagnostic test providers. Despite the increased demand for testing, the South Health Campus Microbiology Laboratory team once again rose to the occasion, delivering high-volume testing with timely results. Total 954,382 SARS-CoV-2 diagnostic tests were completed by the site in 2021 – the largest testing volume completed by any one laboratory supporting public health testing in the province that



year – with 84% and 97% of results available within 24 and 36 hours from specimen collection, respectively. Operational since May 2020, the site marked in 2021 its first year of operations and the completion of its first million tests in May 2021 with a celebratory button designed by the Alberta illustrator Jason Blower to celebrate the dedication and commitment of its laboratory staff, our true COVID lab heroes.

### **DPLM Chair's Awards**

### Education

Dr. Amy Thomassen Dr Carolin Teman

### Research (GFT Faculty)

Dr. Johann Pitout

### Research (Clinical Faculty)

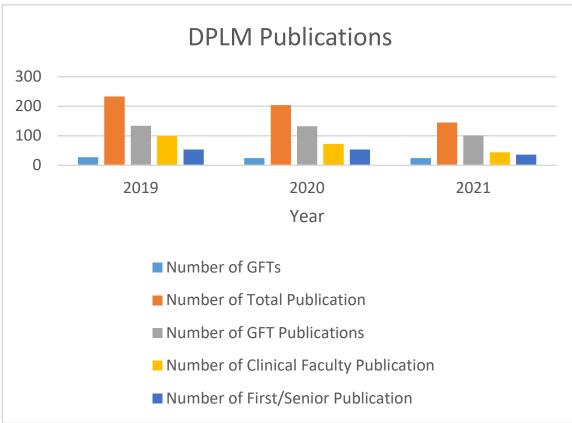
Dr. Parham Minoo

### Service Awards

Dr. Leland Baskin (General Pathology) Dr. Poonam Dharmani (Hematopathology) Dr. Dennis Orton (Clinical Chemistry) Dr. James R. Wright, Jr Dr. Les Eidus (Anatomic Pathology) Dr. Doreen Paslawski (Anatomic Pathology) Dr. Sandra Lee (Anatomic Pathology) Dr. Luiz Lisboa (Medical Microbiology) Dr. Yinong Wang (Anatomic Pathology) Dr. Stefan Urbanski (Anatomic Pathology) Dr. Karim Khetani (Anatomic Pathology)

### **Publications**





105	19K	12.43	144	13K	14.28
# of Publications	Count of Citations	Citations Per Publication	# of Publications	Count of Citations	Citations Per Publication
11.07	12 # of Publications as 1st Author	12 * of Publications as Last Author	28.52	<b>7</b> # of Publications as 1st Author	35 # of Publications as Last Author
1.49	10	0	1.79	40	3
Field Weighted Citation Impact	# of Publications as Corresponding Author	# of Publications as Single Author	Field Weighted Citation Impact	* of Publications as Corresponding Author	# of Publications as Single Author

#### **DPLM Clinical Faculty Publication Metrics**

#### **DPLM GFT Faculty Publication Metrics**

#### Benediktsson, Hallgrimur

 Chung, H., T. Komada, A. Lau, M. Chappellaz, J. M. Platnich, H. D. de Koning, B. Petri, Y. Luque, S. Walker, H. Benediktsson, L. Mesnard, J. Chun, and D. A. Muruve. 2021. AIM2 Suppresses Inflammation and Epithelial Cell Proliferation during Glomerulonephritis. J Immunol 207: 2799-2812.

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- 2. Wright JR Jr: "Osler Warned": Was William Osler a Grave Robber While at McGill or Was He a Victim (or Perpetrator) of One Final Practical Joke? In: The Persisting Osler-V. Selected Transactions of the American Osler Society, edited by Charles Bryan CS, Molina JM, and Stone MJ, Sagamore Beach, MA: Science History Publications, 2021, pp. 47-59 (reprinted with permission from: Clinical Anatomy).
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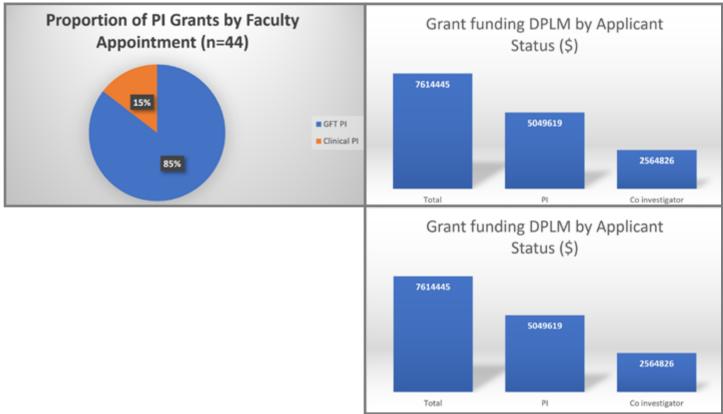
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- 4. Yang XR, Wright JR Jr, **Yu W**, Langdon KD, Somerset D, Thomas MA. Parietal bone agenesis and athelia in retinoic acid embryopathy: An expansion of the phenotype. Birth Defects Res. 2022 Jan 1;114(1):17-22. doi: 10.1002/ bdr2.1965. Epub 2021 Nov 13. PMID: 34773723.

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- Zhang, J., Conly, J., McClure, J., Wu, K., Petri, B., Barber, D., Elsayed, S., Armstrong, G., Zhang, K.\* (2021). A Murine Skin Infection Model Capable of Differentiating the Dermatopathology of Community-associated MRSA Strain USA300 from other MRSA Strains. Microorganisms 9(2), 287:1-23.

# Grants



Principal Investigator/Co-Investigators	Year	Funding Source	Pl/Co-Inv	Total Awarded 2021
Berenger, Byron				
COVID-19 Variant Supplement - Rapid, Ultra- sensitive Clinical Detection of 2019 Novel Coro- navirus (nCOVID-19) by Novel Microfluidic Electrochemical Nano-Biosensors	2021-2022	Canadian Insti- tutes of Health Research (CIHR)	Co-Inv	\$25,000.00
Rapid, Ultrasensitive Clinical Detection of 2019 Novel Coronavirus (nCOVID-19) by Novel Mi- crofluidic Electrochemical Nano-Biosensor	2020-2022	CIHR	Co-Inv	\$265,186.66
Development and Implementation of Rapid Me- ta-Genomic Sequencing Coupled With Isother- mal Amplification Point of Care Testing for Viral Diagnostics	2020-2021	Genome Alberta	Co-Inv	\$159,616.66
Genomics-Enhanced Rapid COVID-19 Pandemic Response	2020-2021	CIHR	Co-Inv	\$118,750.00
COVID-19 Precision Health Genomics for Chil- dren: A Multiomic Study of the ABCCC (Alberta Childhood COVID-19 Cohort)	2020-2021	Genome Alberta	Co-Inv	\$118,750.00
Rapid RNA Sequencing of Coronavirus for Public Health Surveillance and Transmission	2020-2022	CIHR	Co-Inv	\$262,680.00

Principal Investigator/Co-Investigators	Year	Funding Source	PI/Co-Inv	Total Awarded 2021
Berka, Noureddine				
Precision Medicine Can PREVENT AMR: Apply- ing Precision Medicine Technologies in Canada to Prevent Antibody Mediated Rejection and Premature Kidney Transplant Loss	2018-2021	Genome Canada and Precision Health	Co-App	\$388,000.00
Bismar, Tarek				
Oncomine Thermofisher Translational Clinical grant	2021-2022	Thermo Fisher	PI	\$133,633.00
Gene Expression Signature for Predicting Disease Progression	2020-2021	ALMAC claraT Grant Pro- gramme for Academia	PI	\$14,500.00
Characterization of Novel Molecular Signature for Accurately Predicting Prostate Cancer Progres- sion in Active Surveillance	2020-2021	Prostate Cancer Canada	PI	\$250,000.00
Chan, Jennifer				
Combined MEK inhibition and metronomic chemotherapy for recurrent/refractory paediatric low grade Gliomas	2020-2025	CIHR	Co-Inv	\$254,362.50
The Prairie Cancer Research Consortium (PCRC) – Pilot Project	2020-2022	Terry Fox Re- search Institute	Site PI	\$75,000.00
Drivers of oligodendrocyte precursor cell dys- function in the origin and maintenance of oligo- dendroglioma	2019-2022	CIHR	PI	\$125,651.50
PROFYLE Model Systems Activities in Calgary	2019-2022	Alberta Cancer Foundation	PI	\$69,125.00
Precision Oncology for Young People (PROFYLE)	2016-2022	Terry Fox Re- search Institute	Co-Inv	\$70,025.14
Church, Deirdre				
Genotyping of Pseudomonas aeruginosa from bloodstream infections in the Calgary Zone	2021-2023	APL Research Grant	PI	\$3,333.33
Paving a path to improved access: The STB- BI-Care Study	2021-2023	CIHR	Co-PI	\$33,333.33
Invasive Anaerobe Infections in the Calgary Zone	2021-2026	, ,	PI	\$8,333.33
Relationships between invasive infection and outcomes in lung cancer patients in Alberta: A longitudinal retrospective study before and after adoption of immunotherapy	2021-2026	APL/AHS/UC	Co-PI	\$16,666.66
De Koning, Lawrence				
Development of novel risk prediction scores for emergency department patients with suspected coronary artery disease.	2019-2021	CIHR	Co-Inv	\$41,000.00
Maternal Iron Nutrition and its Consequences in Pregnant Women and Their Children in the Alberta Pregnancy Outcomes and Nutrition (APrON) Study.	2018-2021	CIHR	Co-Inv	\$96,250.00

Principal Investigator/Co-Investigators	Year	Funding Source	PI/Co-Inv	Total Awarded 2021
Dharmani-Khan, Poonam	<u>.</u>			
Early Detection of Acute Myeloid Leukemia (AML) relapse after allogeneic HCT	2019-2022	Alberta Can- cer Foundation (ACF), R.K. Dixon Award	Co-Inv	\$231,250.00
Kelly, Margaret				
Intervention to Address Workload Allocation in Anatomic Pathology at Foothills Medical Centre	2021-2023	Alberta Precision Laboratories Res- ident Research Award. Resident: Amy Varner	Ы	\$1,000.00
Multiplexed ion beam imaging can delineate the tissue inflammatory microenvironment for formalin-fixed paraffin-embedded human brain tissue samples of Alzheimer's disease	2021-2023	Alberta Precision Laboratories Res- ident Research Award Chris Newell.	Ы	\$1,666.67
Establishing a biorepository and cohort of Alber- tans tested for COVID-19	2020-2021	Clinical Research Fund (CRF) award from the Calgary Centre for Clinical Re- search (CCCR), University of Calgary.	PI	\$3,750.00
The pathogenesis of vaping-associated lung inju- ry: Interactions between the alveolar epithelium and the immune system.	2020-2023	Catalyst Grant: Health Effects of Vaping; Funding Opportunity competition	Ы	\$33093.33
Multiplexed Ion Beam Imaging Technology	2020-2022	Alberta Chil- dren's Hospital Foundation Child Health Grant Program	PI	\$333,333.33
Imaging COVID-19 Lungs to Uncover Therapies	2020-2025	COVID-19 Rapid Research Fund- ing Opportunity	Co-Inv	\$211,000.67
Elected to use for operating funds	2019-2024	Alberta Chil- dren's Hospital Foundation Pediatric Chair in Respirology Research Prize	PI	\$5000.00
Wild Microbiome and Immunity Centre	2020-2025	Canadian Foun- dation for Inno- vation	Co-Inv	\$810,000.00
Collection and storage of clinical samples from COVID-19 positive cases	2020-2021	The Calgary Foundation & The Calgary Health Trust	Co-PI	\$150,000.00

Principal Investigator/Co-Investigators	Year	Funding Source	PI/Co-Inv	Total Awarded 2021
Systemic and Local Immune landscape of Chil- dren presenting to the Emergency Department with suspected appendicitis (SLICED): Innova- tion through Multiplex Ion Beam Imaging	2020-2021	Department of Pediatrics 2019 Innovation Awards	Co-Inv	\$12,500.00
Non-classical mechanisms for leukocyte recruit- ment in the lungs: therapeutic targets for attenu- ating acute lung injury	2020-2025	CIHR Fall 2020 Project Grant	Co-Inv	\$146,625.00
The Chair in Pediatric Respirology (\$5,000,000 endowment)	2019-2024	Alberta Chil- dren's Hospital Foundation, the Alberta Lung Association and the Cal Wenzel Family Founda- tion through a donation to the Cumming School of Medicine	PI	\$166,666.67
Investigating the phenotype and role of mast cells in idiopathic pulmonary fibrosis	2019-2024	2019 Project Grant	Co-Inv	\$82, 213.50
	2017-2021	PDL-1 Pan-Ca- nadian Harmoni- zation Study	Co-Inv	
Subspecialization of Surgical Pathology Services at Foothills Medical Centre	2019-2022	Alberta Precision Laboratories Res- ident Research Award		\$1250.00
Joseph, Jeff				
	2021	Burns and Berlin Professorship in Dementia Research	Co-PI	\$115,000.00
Khan, Faisal				
Screening for SARS-CoV-2 variant of concerns (VOC) using a point-of-care LAMP test coupled to the Alberta Border Testing Pilot Program	2021	CIHR	Co-Inv	\$50,000.00
Kurek, Kyle				
Vascular Anomalies in PTEN Hamartoma Tumor Syndrome	2021	PTEN Research (UK)	Co-PI	\$275,000.00
Molecular Basis of Congenital Hemangioma Involution	2021	Children's On- cology Group/ Boston Children's Hospital	Co-PI	\$75,000.00

Principal Investigator/Co-Investigators	Year	Funding Source	PI/Co-Inv	Total Awarded 2021
Mahe, Etienne				
Evaluating the potential of Cyclin D1 as a Bio- marker in Multiple Myeloma	2021	Alberta Precision Labs	PI	\$2,542.00
Improving the reliability of buccal swab germa- line sampling with rapid cell culture	2021	University of Calgary	PI	\$10,000.00
Mansoor, Adnan				
Exploring the TNFRSF14 locus in Follicular Lymphoma	2021	Alberta Precision Labs	PI	\$6,000.00
Minoo, Parham				
Comprehensive Tissue Microarray Construction of Gastrointestinal Neoplasms (Pancreas – stom- ach -liver)	2019-2022	Precision Med- icine Funding. Alberta Public Laboratories	PI	\$5,000.00
The role of promoter methylation in the develop- ment of appendiceal mucinous neoplasms	2021-2023	Alberta Public Laboratories	PI	\$2,333.33
Naugler, Chris				
Paving a path to improved access: The STB- BI-CARE Study	2021-2022	CIHR Catalyst Grant	Co-Inv	\$50,000.00
Re-purposing the ordering of 'routine' laboratory tests on clinical teaching units (RePort study).	2021-2025	CIHR Project Grant	Co-Inv	\$142,000.00
Re-purposing the ordering of 'routine' laboratory tests on clinical teaching units (RePort study).	2021-2022	CIHR Patient Oriented Re- search Priority Announcement	Co-Inv	\$50,000.00
Wastewater surveillance of SARS-COV2 to enable real-time clinical case-finding in Calgary	2020-2022	CIHR	Co-Inv	\$168,436.66
De-implementing low value care: a research pro- gram of the Choosing Wisely Canada Implemen- tation Research Network.	2018-2022	CIHR SPOR In- novative Clinical Trial Multi-Year Grant	Co-Inv	\$120,000.00
Reducing the global burden of infectious diseases through precision population health	2018-2022	Large-Scale Applied Research Project Compe- tition, Genomics and Precision Health	Co-Inv & Clinical Lead	\$2,206.00
Orton, Denis				
Development of a screening method to predict adverse outcomes in 5-FU chemotherapy	2021	Alberta Precision Laboratories	PI	\$10,000.00
Pillai, Dylan				
C Difficile Near Patient Testing	2018-2023	CIHR	PI	\$56,730.83
Unrestricted education grant	2019-2024	Diasorin Canada Inc.	PI	\$548.12
Unrestricted education grant	2019-2024	Diasorin Canada Inc.	PI	\$416.66

Principal Investigator/Co-Investigators	Year	Funding Source	PI/Co-Inv	Total Awarded 2021
Development and implementation of rapid metagenomic sequencing coupled with isother- mal amplification point of care testing for viral diagnostics	2020-2023	CIHR, SSHRC, Genome Canada	PI	\$178,246.25
Development and implementation of rapid metagenomic sequencing coupled with isother- mal amplification point of care testing for viral diagnostics	2020-2023	Genome Canada	PI	\$61,178.75
LAMPREG TRIAL/Illucidx Active case detection of malaria in pregnancy	2020-2022	Grand Chal- lenges Canada, Foundation for Innovative New Diagnostics, Uni- versity of Calgary	PI	\$166,666.66
Illucidx Inc. Innovate Calgary Start Up	2020-2021	Life Sciences Innovation Hub Fellowship	PI	\$100,000.00
Development of microfluidic cartridge for COVID 19	2020-2022	Thistledown Foundation/Fast Grants	PI	\$100,000.00
Quantification of SARS-CoV-2 viral load in clini- cal and environmental samples	2020-2021	Canada Founda- tion for Innova- tion (CFI)	PI	\$164,380.90
Development of microfluidic cartridge for COVID 19	2020-2022	Fast Grants - Emergent Ven- tures	PI	\$105,550.00
LAMP to detect malaria in pregnancy (LAM- PREG TRIAL) – matching funds	2020-2023	Alberta Chil- dren's Hospital Foundation	PI	\$12,500.00
LAMPREG Trial	2020-2023	Foundation For Innovative New Diagnostics	PI	\$36,205.00
Faculty Start-up Funds	2011-2024	U of C, AHS Individual Dona- tions	PI	\$1,896.15
Medicine Educational Initiatives Becton Dickin- son	2018-2021	Becton Dickinson Canada Inc	PI	\$693.75
COVID-19 Variant Supplement – Development and implementation of rapid metagenomics sequencing coupled with isothermal amplification point of care testing for viral diagnostic	2021	CIHR	PI	\$50,000.00
Combating Antibiotic Resistence in Philippine Lakes: One-Health upstream interventions to reduce the burden (ARPHILAKE	2021	JPIAMR (through CIHR)	PI	\$562,461.00
A multi-disciplinary approach for the develop- ment of a point of care solution for the detection of SARS-CoV-2	2021	Industry (Deep- Biologics)	PI	\$48,924.20

Principal Investigator/Co-Investigators	Year	Funding Source	PI/Co-Inv	Total Awarded 2021
Pitout, Johann				
Genomic Epidemiology of CTX-M plasmids in the Calgary region	2021	Alberta Precision Laboratories	PI	\$10,000.00
Prokopishyn, Nicole				
ExCELLirate Canada – Nationally Coordinated Research Platform for Next Generation Cancer Cell Therapies	2021	Canadian Foundation for Innovation (CFI) Innovation Grant	Co-PI	\$453,119.37
Schell, Andrew				
Fecal Immunochemical Test for post-polypecto- my surveillance to Reduce Unnecessary eNdosco- py (FIT2RUN Study).	2021-2023	Saskatchewan Health Authority	Co-PI	\$56,419.00
Wright, Jim				
Training Grant for expansion of PA Training program by two students – with practical training to be provided in Saskatoon and Regina	2021-2023	Saskatchewan Health Authority	PI	\$19,333.33
Zhang, Kunyan				
Caenorhabditis elegans as an in vivo model for antimicrobial resistance.	2021	2021 Alberta In- novates Summer Research Stu- dentship (SRS) Award	PI	\$6,000.00
Molecular assay development and their applica- tions in the Centre for Antimicrobial Resistance (CAR) Program	2017-2022	Alberta Health Services (AHS)- CAR Program Laboratory	PI	\$50,000.00

