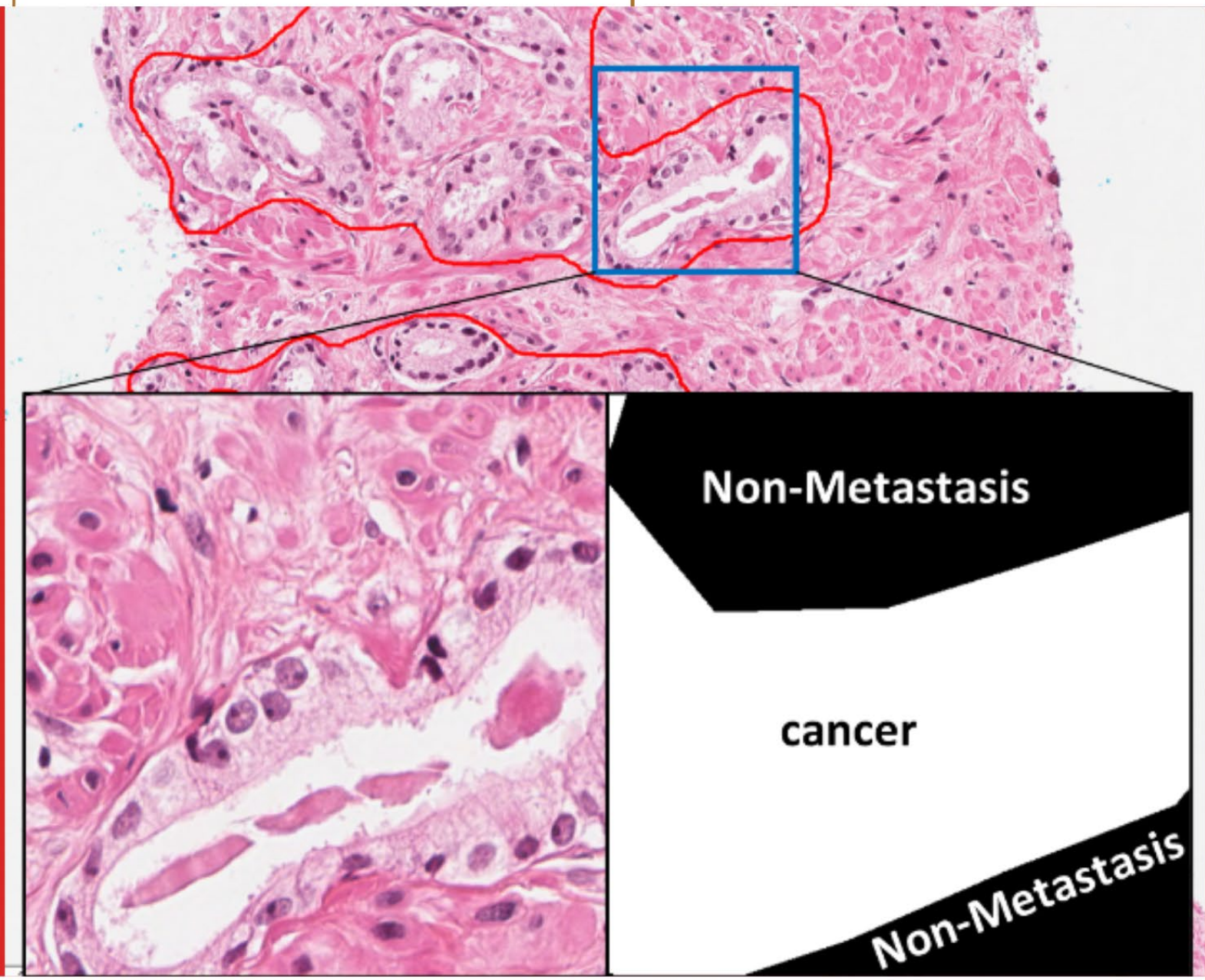
DEPARTMENT OF PATHOLOGY & LABORATORY MEDICINE

2022-2023 Annual Report



UNIVERSITY OF CALGARY

ALBERTA PRECISION LABORATORIES
Leaders in Laboratory Medicine

Alberta Health Services

Contents

Territorial Land Acknowledgement 4

Executive Summary 5

2024 DPLM Organizational Structure 7

2024 U of C Organizational Structure 8

2024 AHS Organizational Structure 9

2024 APL Organizational Structure 10

Clinical Section Updates 12

Diagnostic and Molecular Pathology 12

Diagnostic and Clinical Pathology 13

Medical Microbiology 15

Clinical Biochemistry 15

Neuropathology 18

Hematopathology 19

Cytopathology 19

Education 22

Diagnostic and Molecular Pathology Program 22

Medical Microbiology Program 23

The Neuropathology Program 25

Diagnostic and Clinical Pathology Program 27

Medical Scientific Staff Departures & Arrivals 29

Department of Pathology & Laboratory Medicine Chair's Awards 30

2022 30

2023 31

Research 33

Publications 39

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. Katrina Epp.

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.

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Territorial Land Acknowledgement

The University of Calgary, located in the heart of Southern Alberta, both acknowledges and pays tribute to the traditional territories of the peoples of Treaty 7, which include the Blackfoot Confederacy (comprised of the Siksika, the Piikani, and the Kainai First Nations), the Tsuut'ina First Nation, and the Stoney Nakoda (including Chiniki, Bearspaw, and Goodstoney First Nations).

The City of Calgary is also home to the Métis Nation of Alberta (Districts 5 and 6).

Photo credit: Yannick Menard, Unsplash

Department of Pathology and Laboratory Medicine Annual Report (2022-23)

Executive Summary


Photo credit: DPLM website

The Department of Pathology and Laboratory Medicine is now well past the 50-year mark and has seen many changes come and go in the model of clinical service delivery. Perhaps 2022-23 marked the most dramatic to and fro in service delivery seen in that 50 years. The two years saw the appearance of DynaLifeDx as the winning proponent of the request for proposals to provide laboratory services to the community sector in Calgary and indeed the rest of the province. The community versus acute care split was somewhat arbitrary and while it had performed well in the Edmonton zone, the onus was on the the private provider to demonstrate it could work provincially. In spite of a Herculean effort at a breakneck pace, DynaLifeDx struggled to meet the key performance indicators for laboratory service, with perhaps the most visible being the time to obtain an appointment at our patient service centres. As a result, the Department was informed in mid-2023 that DynaLifeDx would no longer retain the contract and all community services were to be re-integrated to Alberta Health Services (Alberta Precision Laboratories). On a more positive note, during these changes, a single laboratory information system was implemented for all of Alberta called "Connect Care". This was a tremendous success and will hopefully enable big data science and clinical research at an unprecedented and integrated scale.

All this to say, there were consequences to the Department as the changes proved to be highly disruptive and drew resources and attention away from the core business of the Department: world-class clinical service, research and teaching. The transitions resulted in changes to research processes, teaching resources, and services rendered by pathologists, lab physicians and clinical scientists in a manner that challenged academic excellence. We have now emerged from this costly 'flip-flop' relatively unscathed with all residency programs intact and fellowship programs still functioning. Our academic staff continue to publish but at a lower rate in 2022-23 versus 2021 (perhaps as a consequence of the disruption) but still in leading international journals. We continue to garner extramural funding with considerable success from Tri-Council and other sources. Some of our leading lights have been recognized internationally for their efforts (eg. highly cited researchers by Clarivate) and contribute to guidelines that shape our future clinical practice. Discoveries continue to be translated into clinical practice. And our medical staff contribute to dozens of clinical trials by providing laboratory support. The future is challenged on the technical side with staff shortages and a pipeline that is struggling to replace that essential workforce, this being perhaps the biggest threat to our current service delivery model. Our equipment is aging, and

we are critically in a budget defecit that prevents us from ever-greening the equipment. In my estimation, a paradigm shift in service delivery is required through key innovations the department can help proffer. This will almost certainly include automation, digitization, and AI/machine learning. There is considerable work to do in this regard. We plan to recruit a GFT faculty member to lead this initiative. We also in collaboration with the Dept of Oncology and the Charbonneau Institute will launch the Translational Research Core (TRC) in the new Arthur Child Cancer Centre. The TRC will pioneer new diagnostic tests including digital imaging methods, molecular pathology, and mass spec techniques to support the Alberta ecosystem. The DPLM is sponsoring an AI initiative with digital images of prostate biopsies, biomarkers, and genomic data which holds promise to predict outcomes and impact patient management. Similar efforts are being pursued to create a translational core at the DSC in collaboration with the VPR office at U Calgary to support our clinical areas.

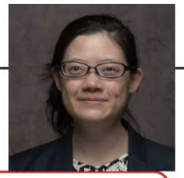
The Department leadership including the Deputy Head and Director of Education have continued to foster research and education excellence. The new triad model has proven effective in maintain DPLM core functions during all the changes in service delivery model. The annual research day was a smashing success with excellent abstracts presented followed by an awards ceremony. We also assembled at a GFT retreat where our academic faculty brainstormed on the future and a report will ensue in 2024 from this event. And finally, we were able to unwind at our Holiday Dinner in December 2022 and 2023 with a chance to reflect and perhaps give consideration to the more important things in life such as a wellness and our families.

Lab will require a paradigm shift that requires new innovations in automation, digitization, and appropriateness using evidence all of which the DPLM is poised to provide as long as we protect the academic education and research activities. To not do so would be short-sighted and further undermine the laboratory mission.

Best wishes,

Dylan Pillai MD, PhD. FRCP (C)
Professor & Head
Department of Pathology & Laboratory Medicine
University of Calgary

2024 DPLM Organizational Structure



Head, Department of Pathology & Laboratory Medicine

Dr. Dylan PIllai
(April, 2021 to present)

Deputy Department Head

Dr Tarek Bismar

Director of Education

Dr Amy Bromley

Clinical Fellowships

Dr. Jeffrey T. Joseph

Pathologist Assistant Program

Bill Gorday

Residency Programs

Resident Research Coordinator

Dr. Martin Hyrcza

Undergraduate Medical Education

Dr. Amy Bromley

Diagnostic and Molecular Pathology

Carolin Teman

Medical Microbiology

Dr. Julie Carson

Neuropathology

Dr. Denise Ng

Diagnostic and Clinical Pathology

Dr. Davinder Sidhu

2024 U of C Organizational Structure

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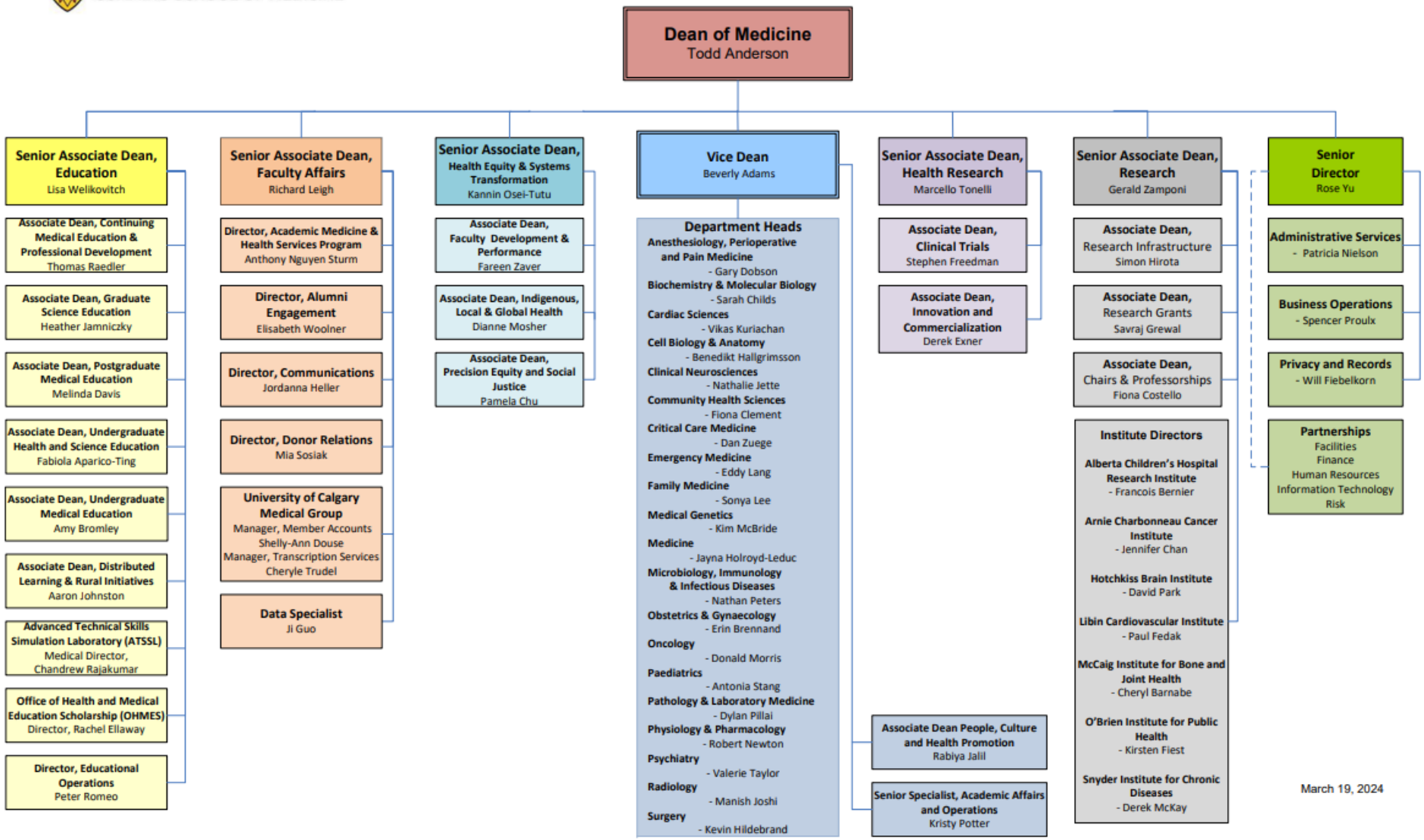
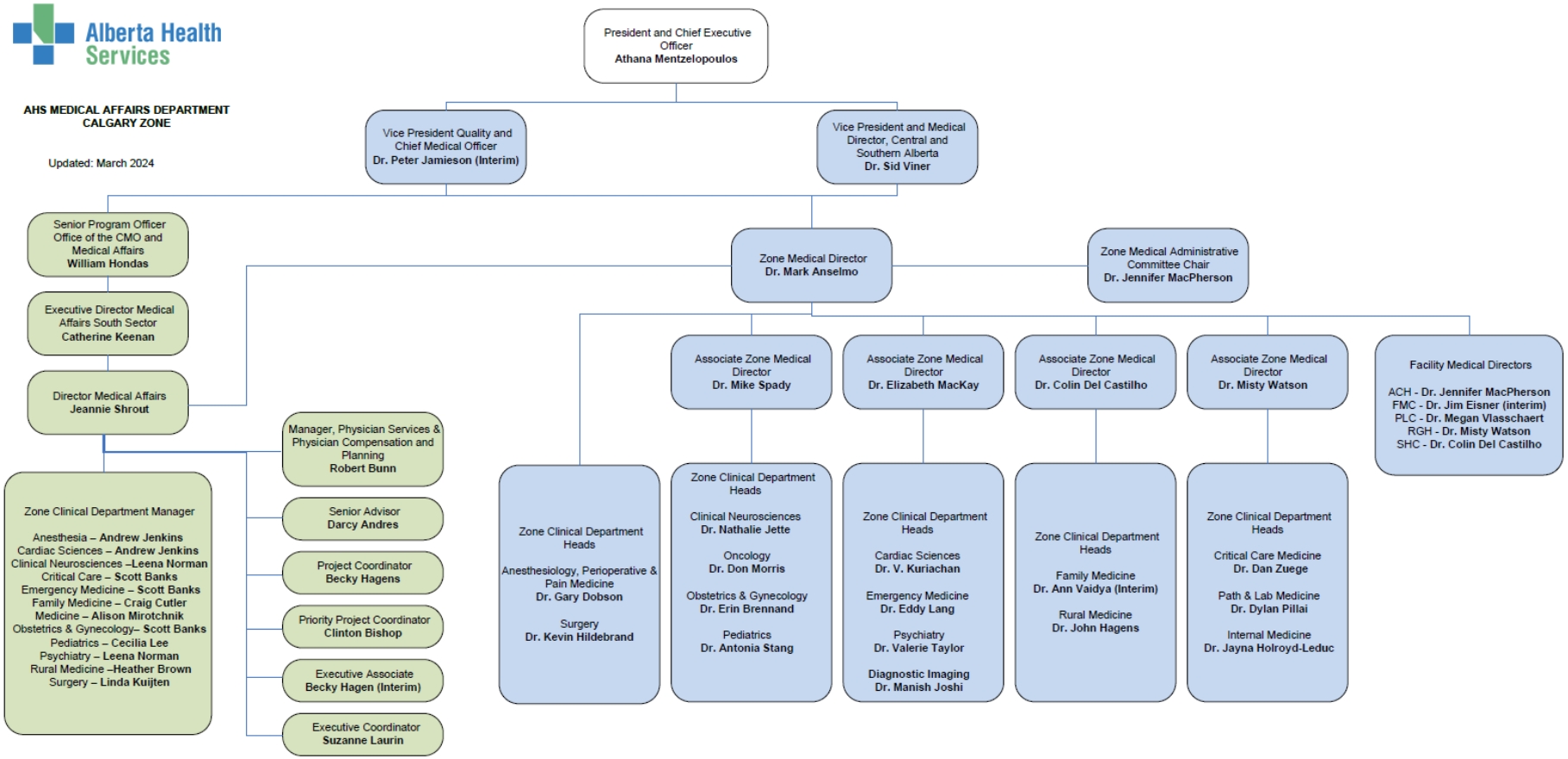
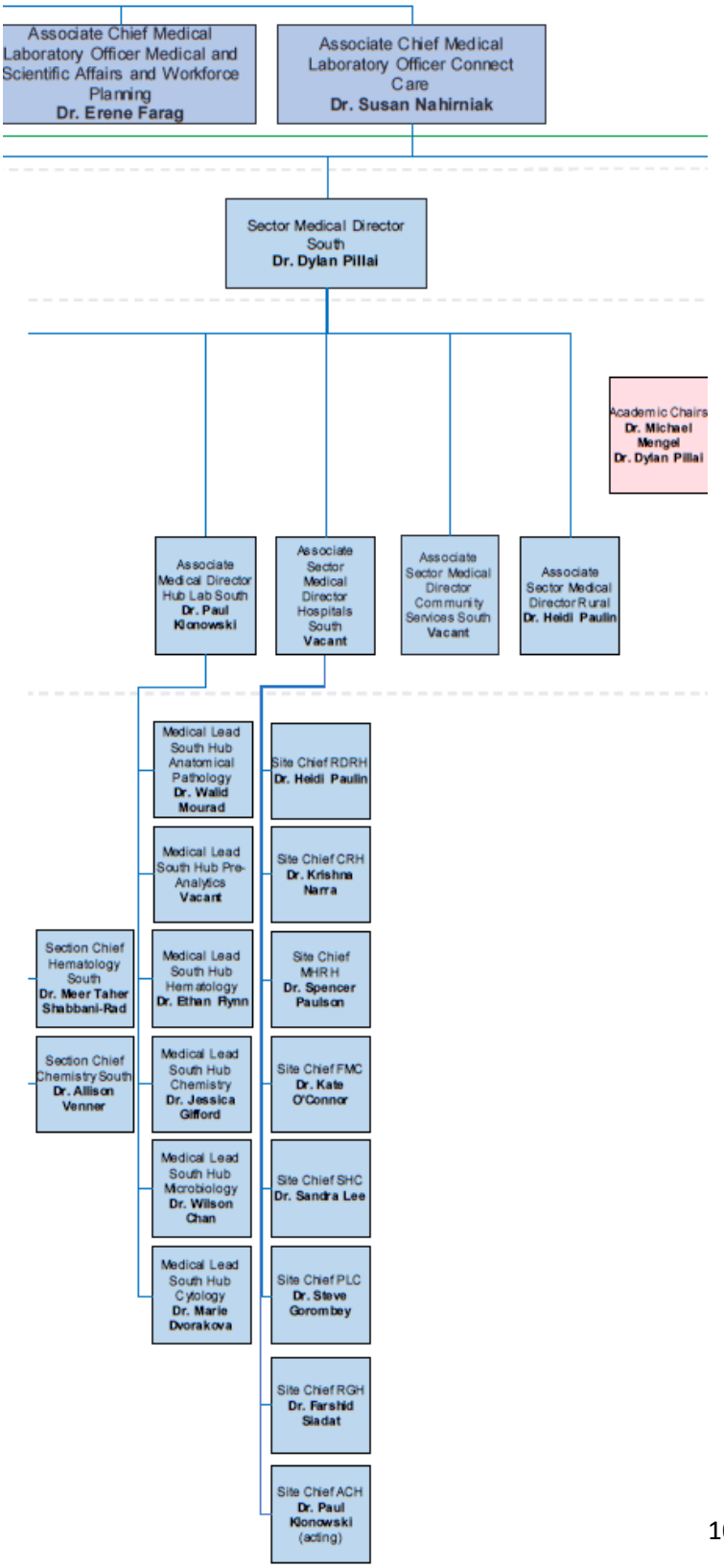
CUMMING SCHOOL OF MEDICINE



2024 AHS Organizational Structure



2024 APL South Sector Organizational Structure



Clinical Section Updates

Photo credit: Totojang, Getty Images via Canva Pro

The Department of Pathology and Laboratory Medicine has stood out for its adaptability and commitment to excellence during the 2022-2023 period.

This portion of our annual report highlights our clinical advancements, how we've navigated through challenges, and the major changes that have shaped our department.

Clinical Section Updates

Diagnostic and Molecular Pathology (credit Drs Paul Klonowski/Ana Cota)

Major Changes

- Extensive planning and subsequent transition of staff, operations, equipment etc. to and then back again from the private provider (DynaLIFE).
- Extensive planning around and then execution of said plan to separate community specimens from acute care specimens, and to centralize some testing from regional sites to the DSC. General impact felt across most sites, most notably at DSC (community) and FMC (consolidation of STAT testing).
- Roll out of ConnectCare and Epic/Beaker, with the need to readjust some workflows, protocols, SOPs, etc. due to the slight differences in the nature of this LIS vs. the former. Extensive effort to reeducate staff, optimize workflow, and to find efficiencies, most of which is still ongoing.
- Major renovation and reconfiguration of space within DSC (performed by private provider), with the expansion of lab space in the histology/cytology areas, addition of a second gross room, second processor room, additional space for microtomy and embedding stations, new special stains area and file room/consult desk area, new shared accession space with ability to cross-train and pull resources to greatest workload demand in AP or Cytology. Entire cytology department moved into newly renovated space at the DSC.
- PLC lab moved to new space with addition of much needed lab and office space.

New Technology, Equipment, Innovations

- Connect Care implementation (May 2023 for most urban sites)
- Replacement of 2 Dako IHC stainers (1 "borrowed" from Lethbridge, 1 from Dako), plus the addition of 1 net new instrument (also Dako), to maintain the constantly increasing pressures on IHC lab.
- Addition (thanks to private provider) of 6 new tissue processors, 1 new embedding station, 4 new grossing stations, new IPC (cassette printer), and 5 new HE600 stainers.
- New Hologic Thin prep processors, imagers, and review scopes (cytology DSC)
- Additional grossing station(s) at PLC.
- Several new IHC antibodies approved and ready to validate or are making their way through the process.

Challenges

- Increased workload with inadequate staffing resources/workforce shortages exacerbated by transitions/integrations, both on the operational side as well as on the medical side, the latter resulting in excess overflow work. We have been unable to fill cytology technologist vacancies due to lack of qualified applicants. An aging work force with seemingly insufficient graduates/qualified candidates to fill looming retirements.
- Ongoing shortages of space within most lab operations, including office spaces for pathologists and PhDs. Some gains at the DSC (thanks to private provider) and PLC, but some areas, such as the DSC IHC lab, RGH, ACH, continue to be very cramped. FMC to see some space gains with transition of some staff to the new Cancer Centre (late 2024).
- Ongoing cuts/attrition and general lack of adequate staffing levels of clerical, admin, and other support staff resulting in daily challenges at every level of the organization, from

manning phones (such as at PLC and ACH with only part time staff available) to sorting slides, triaging consult/send out cases, to helping with minuting of meetings.

- Ongoing intermittent issues with staining quality, water quality, supply chain issues (delays in shipments of consumables and reagents, the changes in formulations of IHC aliquots, etc.)
- Ongoing issues with logistics, exacerbated by transition to private provider, with delays in delivery of slides to pathologists, some missed/delayed deliveries of specimens between sites.
- High volumes of sample deficiencies, leaking containers, missing clinical histories/demographics/etc. requiring mitigation and follow-up.
- Aging equipment, including microscopes, with insufficient replacement.
- Lack of dedicated equipment and space to process neuropath specimens, as well as IHC stain for prion protein, exacerbated by CJDSS severing its contract with Federal agencies, has made neuropathology/autopsy practice challenging, with extreme delays in processing of neuropath samples. A QAR resulting from contamination of 2 IHC processors as well as the other challenges forced us to explore other options – possibly solution/implementation still an ongoing effort.


Photo credit: DPLM website

- Increased testing volumes across the board, including additions of new IHC stains, with difficulty of keeping up with increased requests/workload due to staffing levels and delays in validating already approved stains. Ongoing difficulty in obtaining control tissues. Delays in implementation of on-slide controls due to lack of capital equipment funds (slide printer).

Diagnostic and Clinical Pathology (credit Dr Ethan Flynn)

Major Changes to Clinical Service & Testing

- Implementation of D-dimer testing for Outpatient collections in Calgary Zone on December 5, 2022 (repatriation from Calgary Zone RRL labs)
- Repatriation of consult to Pathologist cases for Routine CBC/diff performed at South Zone Rural test sites but warranting referral to Pathologist, on December 5, 2022 (formerly, smear to Pathologist consults on these South Zone Rural lab cases were performed by Medicine Hat and Lethbridge-based Pathologists)
- Repatriation of Hematology testing from South Zone testing sites to DSC Hub Lab on February 27, 2023 for South Zone outpatient collections through Patient Service Centres in Lethbridge, Brooks and Medicine Hat; as well as Routine lab tests collected at Rural Healthcare facilities in South Zone that could not be performed at that test site.
- PT/INR, PTT, D-dimer testing on South Zone collections - repatriated back to South Zone hospital lab sites on November 29, 2023.

New Technology, Equipment, Innovations

- DSC Hub Lab Hematology migration from Millennium LIS to Beaker LIS within Epic/Connect Care system on May 6, 2023
- DSC Hub Lab Hematology migration in Sysmex analytic middleware from WAM to Caresphere on May 6, 2023

Challenges

- DSC Hub Lab Hematology underwent significant challenges due to changes in administrative reporting structure, human resources and executive oversight during the 2022-2023 period:
    - Jan 1, 2022 – Dec 4, 2022: APL
    - Dec 5, 2022 – August 31, 2023: DynaLIFE
    - September 1, 2023 – Dec 31, 2023: APL
- Largest challenges occurred with assumption of testing of South Zone routine Hematology collections from South Zone in late 2022. DSC Hub Lab absorbed testing from Medicine Hat and Lethbridge in Fall 2022 (prior to Dec 5, 2022) due to staffing shortages at those lab sites.
    - Staffing shortages on technical/operational side
    - Difficulties and challenges encountered with South Zone Hematology labs operating in the Meditech LIS environment, while DSC Hub Lab Hematology lab operating in (1) Millennium LIS (Feb 27, 2023 until DSC Hub Lab Connect Care go-live on May 6, 2023) or in (2) Connect Care/Epic LIS (May 6, 2023 until South Zone Connect Care/Epic go-live on November 5, 2023.
    - Numerous specimen stability issues and resultant specimen cancellation impacts with specimens collected at South Zone sites but not arriving to DSC Hub Lab Hematology until many hours later ("timed-out"; multiple factors including Preanalytics and Logistics challenges on their end, however problem was worse before May 6, 2023 Connect Care go-live since South Zone PSCs were data entering into Meditech, and then DSC Hub Lab had to re-data enter into a different LIS, Millennium, upon arrival at DSC). Issues with missing samples and timed-out samples from South Zone, primarily with INR testing, has been alleviated since South Zone samples for coagulation testing were re-routed back to South Zone hospital testing labs on November 29, 2023.


Photo credit: Akram Huseyn, Unsplash

- Challenge of smooth transition from Millennium to Epic/Connect Care LIS; compounding the challenge was the concurrent transition from WAM to Caresphere middleware within DSC Hub Lab Hematology: technical and medical training, validation, despite MLT staffing shortages.

Medical Microbiology (credit Dr Wilson Chan/Byron Berenger)

Major Changes to Clinical Service & Testing

- Major changes in governance: transfer of department to DynaLIFE, then reintegration into Alberta Precision Laboratories, has led to major shifts not only of ownership, but in all the ancillary support structures (e.g., IT, HR, Ordering, Quality) and policies on which laboratory performance is based.
- Transfer of testing from rural/regional South Zone community sites has allowed us to consolidate testing, but also resulted in a ~20% increase in workload.
- Implementation of ConnectCare has changed the way the laboratory functions: many benefits, but also has exacted costs in efficiency and utilization.

New Technology, Equipment, Innovations

-
- Lab automation equipment (KiestrA) system has been partially acquired and implemented. Currently used for urine cultures, but with full deployment, application for more specimen types, and additional improvements slated for the future.
- Implementation of a LAMP assay for Group A Streptococcus detection in April 2022: improvements in performance characteristics and efficiency over previous method.

Challenges

- Workforce shortages, like everywhere else in health care, continue to be problematic, and have been exacerbated by the pace and magnitude of changes in the last two years.
- Gaining a measure of operational stability will allow for gains to be made in performance.
- Optimization of ConnectCare for the laboratory continues to be a work in progress.

Clinical Biochemistry (credit Dr Allison Venner/ Jessica Gifford)

Provincial

Major Changes to Clinical Service & Testing

- Insulin-Like Growth Factor-1 (IGF1) moved onto mass spectrometry for testing
- Hemoglobin A1c testing for Canadian Longitudinal Study on Aging (CLSA) testing was moved to Lethbridge, and included dried blood spot analysis validation
- DynaLIFE transition led to workload changes – some sites significant increase (e.g. FMC, SHC, DSC) and other sites significant decrease (e.g. regional site hospitals)
- New tests implemented at FMC: Cholesterol, Cholesterol (Fluid), Ferritin, Free Triodothyronine (FT3), Free Thyroxine (FT4), HDL Cholesterol, LDL Cholesterol Calc/Non-HDL-C Calc, Thyroid Simulating Hormone (TSH), Protein (Total Urine & Protein/Crea Ratio Urine), Total Prostate Specific Antigen, Carcinoembryonic antigen, Bile Acids, Iron, UIBC, TIBC/% sat calc, Chylomicron screen, Chylomicron screen (Fluid)
- Additional testing began at FMC for: APL Research, Community neonatal bilirubin, Community NT-proBNP testing, STAT testing from HCTL after hours
- PLC: Brand new lab space on 6th floor of the East tower June 2023 and successfully completed CPSA accreditation
- PLC: 2 Roche Cobas Pro analyzer lines, additional GEM 5000 blood gas analyzer, Osmopro and A2O osmometers

New Technology, Equipment, Innovations


Photo credit: DPLM website

- Implementation of Epic/Beaker (November 2022, May 2023, November 2023)
- ACH: 2x new Roche Cobas Pro c503 automated chemistry analyzers (includes updates to Methotrexate and Primidone assays), 2x new Medica Pro Type I water systems, Roche AST/ALT Gen 2 reagents were implemented
- ACH: Funding from the Alberta Children's Hospital Foundation for a Roche Cobas Pure e402 immunoassay analyzer to run high-sensitivity cardiac troponin T, Beta-hCG and NT-proBNP on-site. To be implemented in 2024
- FMC: 2 new Roche Cobas C8000 automated chemistry analyzer lines
- Analytical Tox: Working with KeyProteo, a company based in Seattle, assisted with validation of a novel newborn screening test
- Analytical Tox: Reviewing drugs of abuse testing panel
- MHRH: 2x new Roche Cobas Pro c503 automated chemistry analyzers
- CRH: 2x new Roche Cobas Pro c503 automated chemistry analyzers
- Rural sites in Central, Calgary and South: Implementation (or early of plans for) of new Vitros XT-3400s at several sites (continues into 2024)
- Development of a Provincial 2-hr Beckman Access High-sensitivity Troponin I algorithm
- Oilfields and Strathmore: New reagent fridges

Challenges

- Older equipment (e.g. water systems, mass spectrometry analyzers)
- Lack of viable backup analyzers (e.g. osmometers)
- Administrative support for effective RRL function
- Sites with increased workloads have been challenged to manage these increases alongside staffing challenges and new workflows
- Staffing challenges within MLA, MLT, operations and medical laboratory teams across sites/departments
- Staff change fatigue, burnout, and continuous request to do more with less resources
- APL/DynaLIFE transition and integration has had an enormous impact on test menu, routing and courier management/understanding, TATs, staffing levels
- Numerous changes with Connect Care changes required resources to manage, align, troubleshoot workflows and reporting
- Supply chain issues continue to be a problem that has resulted in additional calibrations and troubleshooting.

Calgary Community

Major Changes to Clinical Service & Testing

- In this period, we provided clinical service under two different lab entities:
    - APL: Jan 1-Dec 4, 2022
    - DynaLIFE: Dec 5, 2022-Aug 31, 2023
    - APL: Sept 1-Dec 31, 2023
- DynaLIFE transition on Dec 5, 2022 led to the go live of a number of new tests in DSC Chemistry and associated new instrumentation
    - Instrumentation to perform the Celiac Disease Screen testing
    - Instrumentation to measure serum free light chains
    - Instrumentation to perform hemoglobin electrophoresis and the sign out of results adding a new clinical service to the laboratory staff and medical/scientific staff working in DSC Chemistry: Sign out by Calgary team started Oct 1, 2023. This service was covered by Edmonton staff from Dec 5, 2022 to Oct 1, 2023.
    - Instrumentation to perform serum and urine osmolality testing
    - Mono testing which is a manual process
- DynaLIFE transition on Dec 5, 2022 resulted in DSC Chemistry performing testing for community STAT orders. Prior to this transition, this testing was performed by FMC and the RRLS.

New Technology, Equipment, Innovations

- January 2022 Roche Infinity middleware implementation
- January-October 2022 implementation of 4 new Roche Diagnostics cobas 8000 lines
- Dec 2022 implementation of the following instrumentation associated with the DynaLIFE transition
    - BioRad Bioplex (1)- Celiac testing
    - Binding Site Optilites (2)- serum free light chains
    - Sebia Capillary Flex II- transferred from Edmonton BaseLab when they received new instrumentation (2)- serum protein electrophoresis and hemoglobinopathy investigations
    - Advanced Instruments OsmoPro (1)- serum and urine osmolality testing
- EPIC ConnectCare LIS went live May 6, 2023
- Associated with the ConnectCare implementation, numerous provincial reference interval and reporting harmonization innovations went live

Challenges

- Transition of LIS from Millennium to Connect Care led to the loss of site-specific functionalities. Now, alternatives need to be explored or rebuilt into ConnectCare.
    - Eg. worklist formats, outstanding lists, expected lists
- Routing changes as well as logistic challenges affecting TAT
    - Delayed TATs resulting in the cancellation of time-sensitive analytes eg. potassium, glucose collected in South Zone
    - Delayed critical result reporting from specimen collected in South Zone due to transport time
- Aging equipment (pre-analytics units, electrophoresis equipment, urinalysis equipment). A lot of downtimes either needing manual intervention or affecting TATs.
- Capacity issues

    - 100 % on pre-analytics
    - 97 % on chemistry modules on the Roche cobas lines
    - Protein electrophoresis volume increases
- Lab staffing challenges including burn out. Not enough technologists to manage the increase in workload.

Neuropathology (credit Dr. Jeff Joseph)

Major Changes to Clinical Service & Testing

- Operationalize new molecular diagnostic platforms that relate to neoplastic neuropathology. These include how to incorporate new information into our synoptic reports and our grading of tumours. Major changes were made in Calgary in May-June 2023 that greatly impacted our diagnoses of neoplastic neuropathology.
- Use of antibodies for analysis of inflammatory muscle diseases. Antibodies are the cornerstone for the diagnosis of inflammatory muscle diseases and over these two years have standardized our use of several antibodies that allow us to make more refined and accurate diagnoses. These include: MxA, MCH-1, MCH-2, membrane attack complex, and p62. We have requested that these antibodies be available in Calgary and are working to either get these approved or validate them.
- Streamline CJD testing and handling of tissue. This has been a multi-year endeavour and is not yet complete.
- Approval of new antibodies for neoplastic testing (see below).


Photo credit: Drew Hays, Unsplash

- Increasing complexity of autopsy neuropathology, including neurodegenerative and medical brain diseases. The 2022-2023 was the busiest autopsy neuropathology period in Calgary since 2007.

New Technology, Equipment, Innovations

- Approval of several diagnostic antibodies (MxA, olig2, H3K27-Me3, BRAF-V600E, several for pediatric embryonal tumours)
- Working with the Molecular group, use of their new DNA Next-Generation sequencing and RNA translocation equipment. Quality control all cases that undergo molecular testing.
- In this timeframe, ConnectCare became active and required substantial reworking of how we complete cases and garner information.

Challenges

- Rapidly changing aspects of clinical work. Most notably, tumour molecular diagnostics but also the more detailed aspects of diagnosing muscle diseases, neurodegenerative diseases, and some changes in the diagnoses of epilepsy pathology. We have three staff members who focus on brain tumours from both diagnostic and research sides and update us on new diagnostic entities or grading. The information required in most of our reports is substantially greater than even a few years ago (most tumours, details of muscle diseases, details of neurodegenerative diseases). Ten - fifteen years ago, the majority of our muscle

biopsies were for various types of dystrophies and acquired myopathies; today, the majority of our biopsies are for inflammatory diseases and only a few are now to confirm a previous genetic test.
- Difficulty in having neuropathology staying "current" or providing the ever-changing standard of care on our cases.
- Resource difficulties with severely limited funding for new testing and minimal resources for innovation.
- Teaching demands in this era of changing expectations and increasing sub-specialization. This includes training of neuropathology residents, who now need to know a substantial amount of information that was not even imagined ten years ago or known five years ago.

Hematopathology (credit Dr. Meer-Taher Shabani-Rad)

Major Changes to Clinical Service & Testing

- Hempath group has contributed to the academic performance of the department by publishing multiple articles in peer-reviewed journals during 2023:
    - Published articles by hempath staff; First or last Author: 8 articles
    - Contribution to publications by another groups: 8 articles
    - Dr Adnan Mansoor has had another productive year with publication of 7 articles
    - The article published by Dr Afshin Shameli/Shabani-Rad was recognized as the most cited article of 2022 in the field of Flow cytometry
- Hematopathology staff have supported implementation and validation of Connect Care Launch 6, with physical presence in CZ hospitals since 4:30 AM and supervising and engagement in the validation process of CC for the transition of lab operation
- New platform for Hemoglobinopathy sign-out has been created and integrated to Connect Care
- Hempath group has continued to support APL's Molecular Pathology operation by significant engagement in providing clinical services in the field of molecular hematology
- Successfully secured two Clinical Fellowship positions for 2024 by significant support from DPLM


Photo credit: DPLM website

New Technology, Equipment, Innovations

- Planning for validation of Hempath Labs (flow cytometry and special Hematology labs) in Arthur Child New Cancer Center
- New State of art flow cytometry equipment has been delivered for Flow lab at ACCC

Cytopathology (credit Dr. Marie Dvorakova)

Major Changes to Clinical Service & Testing

- Provincial Pilot study for Self-sampling helping underserved/underscreened populations in AB. The Pilot study has just entered the laboratory validation phase and is expected to start

accepting patient samples likely in the Summer/Fall of 2024. Edmonton Prov Lab will be conducting the hrHPV testing for the Pilot.

- Preliminary discussions about primary HPV screening for cervical cancer are underway with Public Health/ACCSP. Expected phased implementation starting in ~3 years.

New Technology, Equipment, Innovations

- Calgary APL (DSC) was the Canadian testing site for the Hologic Genius Digital System using AI to recognize abnormal cells in cytologic preparations – the system for Gyne Cytology has now been granted Health Canada approval. The system allows for faster screening and slide organization/filing. Could allow sharing scanned slides between the Zones to better utilize Cytotechs for screening without the need to ship glass slides.

Challenges

- Staffing levels on the operational side, with expected retirements within the next 2-3 years. Cytotechs currently working OT to keep up with TAT/KPIs. Currently about 4 FTE short.

Education

Photo credit: Charlotte May, Pexels via Canva

During the 2022-2023 period, the Department of Pathology and Laboratory Medicine focused on delivering robust educational programs and advancing research within the field. Our commitment to quality teaching and evaluation has been central to supporting the academic and professional development of our trainees.

Education

Diagnostic and Molecular Pathology Program (credit Dr. Carolin Teman/Konstantin Koro)

The Diagnostic and Molecular Pathology Program is a five-year program leading to certification in Diagnostic and Molecular Pathology by the Royal College of Physicians and Surgeons of Canada. In 2023, our specialty name was officially changed by the Royal College from Anatomical Pathology to Diagnostic and Molecular Pathology. Our program transitioned to Competency by Design (CBD) in July 2019, and is now almost exclusively comprised of residents in the CBD stream. 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 provide graduated responsibility to residents. In the CBD stream, residents write the practical component of their Royal College Examination in the fourth year of training. In the final year, during Transition to Practice, residents are expected to perform at the level of a fellow or junior faculty member, recognizing that faculty-resident supervision is always occurring. In 2023, we welcomed three new residents through the CaRMS match. 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.

Teaching


Photo credit: DPLM website

A philosophy of supported 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 subspecialty slide sessions, and a dedicated weekly academic half day consisting of unknown slide rounds, autopsy rounds, and didactic teaching. 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. Some sessions are also now offered in hybrid format. Residents are also expected to read and study independently.

Evaluation

CBD residents are assessed based on their achievement of Entrustable Professional Activities (EPAs) as they progress through stages of training. Several rotations incorporate end-of-rotation slide exams or presentations into their assessments. PGY1-PGY4 residents are also assessed via biannual in-house examinations, including a full RCPSC-style examination each winter and spring, and the American Society of Clinical Pathology Resident In-Service Exam (RISE) each spring. 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 mentorship of the Resident Research Advisor. Research activities are generously supported through the DPLM's Trainee Led Project Support Initiative (TLPSI). Residents present their research findings at the annual departmental research day, as well as at national and international meetings.

Resident Progress & News:

Our program graduated two residents in 2023, who went on to complete subspecialty fellowships (Breast Pathology at University of Alberta and Forensic Pathology in Minneapolis). Our current senior residents will complete fellowships in GI Pathology (Memorial Sloan-Kettering Cancer Center), dermatopathology (University of Calgary), and Gynecologic Pathology (University of Calgary) next year. The University of Calgary's Diagnostic and Molecular Pathology residency program is well-regarded nationally and receives a large number of applicants for the annual CaRMS match. In 2023 and 2024 we filled all CaRMS positions with outstanding applicants.

Program Accreditation & Upcoming Changes:

The Diagnostic and Molecular Pathology residency program participated in the Royal College accreditation review in 2022 and received accreditation with follow-up by external review. Several areas for improvement were identified and are being actively addressed. Internal review by PGME is scheduled for summer 2024. Upcoming changes include the implementation of a redesigned longitudinal didactic curriculum that has undergone major organizational changes under the leadership of Dr. Ashely Flaman. The anticipated implementation date is mid-2024. Our program's greatest challenges include continued implementation and changes due to CBD, including faculty development with respect to utilization of EPAs.

Medical Microbiology Program (credit Dr. Julie Carson)

The Medical Microbiology residency training program at the University of Calgary is a full Royal College accredited 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.


Photo credit: Ousa Chea, Unsplash

Resident Progress & News:

In 2022-2023 academic year, the Medical Microbiology program had three residents – PGY2, PGY3 and PGY5 level of training.

Program Accreditation & Upcoming Changes:

The Medical Microbiology residency program was fully accredited by the Royal College of Physicians and Surgeons of Canada in September 2022 with no major deficiencies.

The specialty of Medical Microbiology will implement Competency by Design in July 2024. Pre-launch activities and planning are underway.

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 skillset 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 subspecialties and research of their choosing.


Photo credit: DPLM website

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 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 Adult and Pediatric 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.

Medical Microbiology Residency Program Committee 2022-23

Name	Major Site Affiliation	Major Responsibility with the Program
Carson, Julie	DSC	Program Director, DSC Site Lead
McCartney, Nathan	n/a	Chief Resident
Gregson, Dan	DSC	Research/Academic Coordinator
Groeschel, Michael	DSC and Regional	Exam Chair
Jadavji, Taj	ACH	Pediatric Infectious Diseases representative
Kim, Joseph	RGH	Infection Control or Stewardship representative
Lisboa, Luiz	DSC and Regional	Competency by Design & Competency Committee Chair
Pitman, Shawna	DSC	Program Administrator
Vaughan, Stephen	SHC	Adult Infectious Diseases representative
Zhou, Hong Yuan	Public Health Lab	Public Health Lab Microbiology representative
Bromley, Amy	FMC	Academic Department Education Chair (ex-officio)
Lenz, Ryan	RGH	PGY1 RGH program director (corresponding member)
Pillai, Dylan	DSC	Academic Department Head (ex-officio)
Sidhu, Davinder	DSC/FMC	DCP program director (corresponding member)

The Neuropathology Program (credit Dr. Denise Ng)

One of four training programs in the country, our five-year program aims to train successful future neuropathologists while achieving qualifications for certification in Neuropathology by the Royal College of Physicians and Surgeons of Canada. The educational experiences are provided through a partnership between the University of Calgary and Alberta Precision Labs with added collaboration with the Ministry of Justice through the Office of the Chief Medical Examiner. The Neuropathology Residency Training Program in Calgary boasts extensive exposure to a high volume of neurosurgical and autopsy specimens from both adult and pediatric populations. Our training site is fortunate to have one of the most robust hospital autopsy services in the country and a strong collaboration with the Alberta Children's Hospital. Additionally, the site benefits from strong relationships built with other laboratory medicine colleagues, including but not exclusive to anatomical pathologists, molecular pathologists, forensic pathologists, medical microbiologists, and clinical biochemists. We have also fostered excellent relationships with clinicians, showcasing frequent collaboration as

demonstrated by frequent clinical discussions and multiple interdisciplinary rounds where pathology is presented and discussed.

Competency by Design:

Neuropathology as a specialty had officially transitioned in 2022 to the new Royal College mandated Competency By Design (CBD) curriculum structure. Although extensive planning has been underway in Calgary, initiatives have not been implemented as a new resident has not been matched since the transition.


Photo credit: Dom Fou, Unsplash

In the transition, the program committee anticipates some changes to the structure of training. Formal phases of Transition to Discipline and Transition to Practice stages have been introduced. Although less formalized forms of these training phases been part of our traditional-stream program, these new educational stages have now been formalized with increased structure, clear objectives of training, and formal evaluation. Clinical rotations have been more stringently tailored to the neuropathology training needs, allowing for earlier focus on the Foundation and Core of training. The certification examinations have also been brought forward approximately six months to balance Foundation and Core training needs with exposure to Transition to Practice.

In future, the neuropathology program aims to include a multidisciplinary Competency Committee to review resident evaluation and feedback, as a subcommittee of the Neuropathology Residency Training Committee. We hope to also incorporate participation of neuropathologists from other sites, potentially expanding the expertise made available to our residents.

The program anticipates future modification to the curriculum will be a continuous improvement process, with feedback and support from our highly involved neuropathology staff and residency training leadership, including collaboration with medical leadership and other residency training programs in the Pathology and Laboratory Medicine department.

Current Program

Our program includes two very active traditional stream residents. In the last year, another successful resident completed training and was successful at the Neuropathology certification exams. In the last decade, every successfully graduated neuropathology resident that has applied to the Royal College Examination have successfully passed the Neuropathology certification exams by the Royal College of Physicians and Surgeons of Canada.

On-site Royal College accreditation survey/review of the University of Calgary's Neuropathology Program took place on September 20, 2022. The program was given accreditation with requirement for Action Plan Outcomes Report next year for areas of focused improvement. As part of a concerted effort for continuous improvement, the training program hopes to implement structural and process changes in the committee to address these previous challenges.

Members	Major Site Affiliation	Major Function with the Program
Dr. Denise Ng	Foothills Medical Centre	Program Director
Dr. Dylan Pillai	Diagnostic and Scientific Centre	Department Head
Dr. Amy Bromley	Diagnostic and Scientific Centre	General Pathology and Associate Dean, Undergraduate Medical Education
Dr. Jeffrey T. Joseph	Foothills Medical Centre	Neuropathology Division South Sector Lead, Committee member
Dr. Jennifer Chan	Arnie Charbonneau Cancer Institute	Institute Director of the Arnie Charbonneau Cancer Institute, Research advisor, Committee member
Dr. Kristopher Langdon	Foothills Medical Centre	Committee member
Dr. Ana Nikolic	Foothills Medical Centre	Research advisor, Committee member
Dr. Omid Rashidipour	Foothills Medical Centre	Committee member
Dr. Akmal Coetzee-Khan	Office of the Chief Medical Examiner (OCME)	Coordination of OCME site training
Dr. Marie-Anne Brundler	Alberta Children's Hospital (ACH)	Coordination of ACH site training
Chief Resident Chris Newell	Foothills Medical Centre	Resident Representative

Diagnostic and Clinical Pathology Program (credit Dr. Dave Sidhu)

Our program is a five-year program leading to certification in anatomic and clinical Pathology by the Royal College of Physicians and Surgeons of Canada. The University of Calgary through co-sponsorship with Alberta Precision Labs offer Diagnostic and Clinical Pathology Residency Training highlighting on laboratory management and pathology informatics. The Diagnostic and Clinical 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 anatomical and clinical pathology and medical laboratory directors. In 2023 the residency program name was officially changed from General Pathology to Diagnostic and Clinical Pathology by the Royal College.


Photo credit: DPLM website

Competency by Design:

Since 2019 the Diagnostic and Clinical Pathology (DCP) 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 9 residents are currently enrolled in the DCP 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 a single legacy traditional stream resident 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 academic year saw our first cohort of DCP 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 DCP 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 8 years. We currently have 9 residents in the program and continue to deal with and overcome the current challenges of the ongoing laboratory services transition and postgraduate program funding 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. Amy Bromley	Diagnostic and Scientific Centre	General Pathology and Associate Dean, Undergraduate Medical Education
TBA	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. Konstantin Koro Dr. Simon Walker	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 Scientific Staff Departures & Arrivals

Arrivals

Name	First	Effective Date	Site	Specialty
Vuong	Jennifer	10-Jan-22	FMC	Anatomic Pathology
Heaton	Sarah	07-Feb-22	DIASCI	Anatomic Pathology
Todorovic	Emilija	11-Apr-22	FMC	Anatomic Pathology
Al-Shamma	Zainab	01-Jul-22	FMC	Anatomic Pathology
Liao	Chiu-Hsiang	02-Aug-22	RGH	Anatomic Pathology
Wang	Linyuan	02-Aug-22	FMC	Anatomic Pathology
Walker	Simon	08-Aug-22	FMC	Anatomic Pathology
Flaman	Ashley	06-Sep-22	DIASCI	Anatomic Pathology
Tordon	Bryan	01-Mar-23	FMC	Transfusion Medicine
Seno	Rommel	01-Jul-23	FMC	Hematopathology
Cavazzi	Elena	14-Aug-23	FMC	Anatomic Pathology
Fung	Bonita	14-Aug-23	ACH	Pediatric Pathology
Tzafriri	Ori	01-Sep-23	PLC	Anatomic Pathology
Rashidipour	Omid	01-Oct-23	FMC	Neuropathology/Molecular

Departures

Name	First	Effective Date	Site	Specialty
Thommasen	Amy	15-Apr-2022	DSC	General Pathology
Falck	Vince	30-Jun-2022	FMC	Anatomic Pathology
Paslawski	Doreen	30-Jun-2022	RGH	Anatomic Pathology
Wright	James (Jim)	30-Jun-2022	ACH	Pediatric Pathology
Mirza	Imran	30-Nov-2022	FMC	Molecular Pathology
Terzic	Tatjana	2-Dec-2022	DSC	Anatomic Pathology
Shameli	Afshin	31-Mar-2023	FMC	Hematopathology
Kurek	Kyle	30-Jun-2023	ACH	Pediatric Pathology
Liao	Chiu Hsiang (Connie)	31-Aug-2023	RGH	Anatomic Pathology
Brenn	Thomas	30-Nov-2023	DSC	Anatomic Pathology
Baskin	Leland	31-Dec-2023	DSC	General Pathology
Cota Schwarz	Ana	31-Mar-2024	FMC	Anatomic Pathology

Department of Pathology & Laboratory Medicine Chair's Awards

2022

Education Awards

Dr. Etienne Mahe
Dr. Julie Carson

Research Awards

Dr. Byron Berenger (Clinical Faculty)
Dr. Tarek Bismar (GFT Faculty)

Clinical Service Awards

Dr. Marie Dvorakova (Anatomic Pathology)
Dr. Angela Franko (Anatomic Pathology)
Dr. Michael Groeschel (Medical Microbiology)
Dr. Charlene Hunter (Anatomic Pathology)
Dr. Etienne Mahe (Hematopathology)
Dr. Shaun Medlicott (Anatomic Pathology)
Dr. Denise Ng (Neuropathology)
Dr. Travis Ogilvie (Anatomic Pathology)
Dr. Heidi Paulin (General Pathology)
Dr. Hossein Sadrzadeh (Clinical Chemistry) [Special Long Service Award]
Dr. Anna Sienko (Anatomic Pathology)
Dr. Kiril Trpkov (Anatomic Pathology)
Dr. Ranjit Waghray (Anatomic Pathology) [Special Long Service Award]
Dr. Emma Whitcomb (Anatomic Pathology)


Photo credit: DPLM website

2023

Research

Dr. Margaret Kelly (GFT Faculty)
Dr. Ramin Zargham (Clinical Faculty)

Clinical Service Awards

Dr. Xiu Jian (Hematopathology)
Dr. Tom Griener (Medical Microbiology)
Dr. Amy Bromley (Anatomic Pathology)
Dr. Allison Venner (Clinical Biochemistry)
Dr. Leland Baskin (General Pathology)

Education Awards

Anna Thomas: Resident Appreciation Award
Dr. Mike Harvey: SS Collegiality Award
Dr. Kyo Farrington: Outstanding Teaching by a Resident
Drs. Zainab Al-Shamma & Amy Bromley Faculty Teacher of the Year


Photo credit: DPLM website

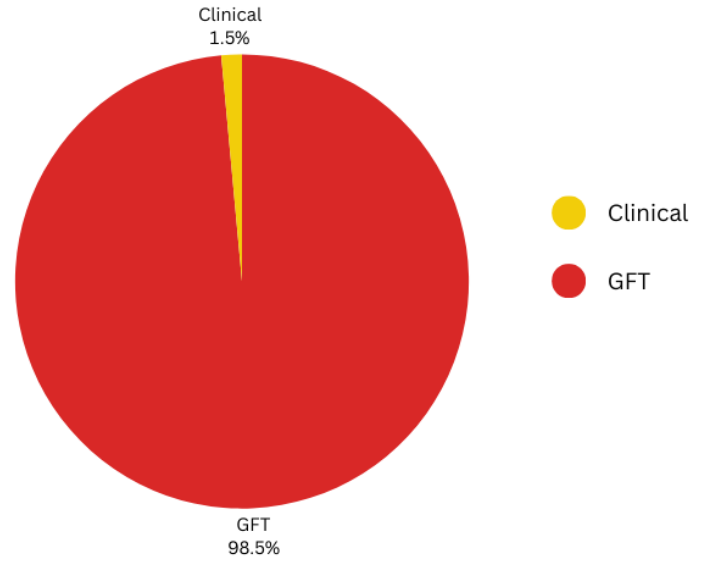
Research

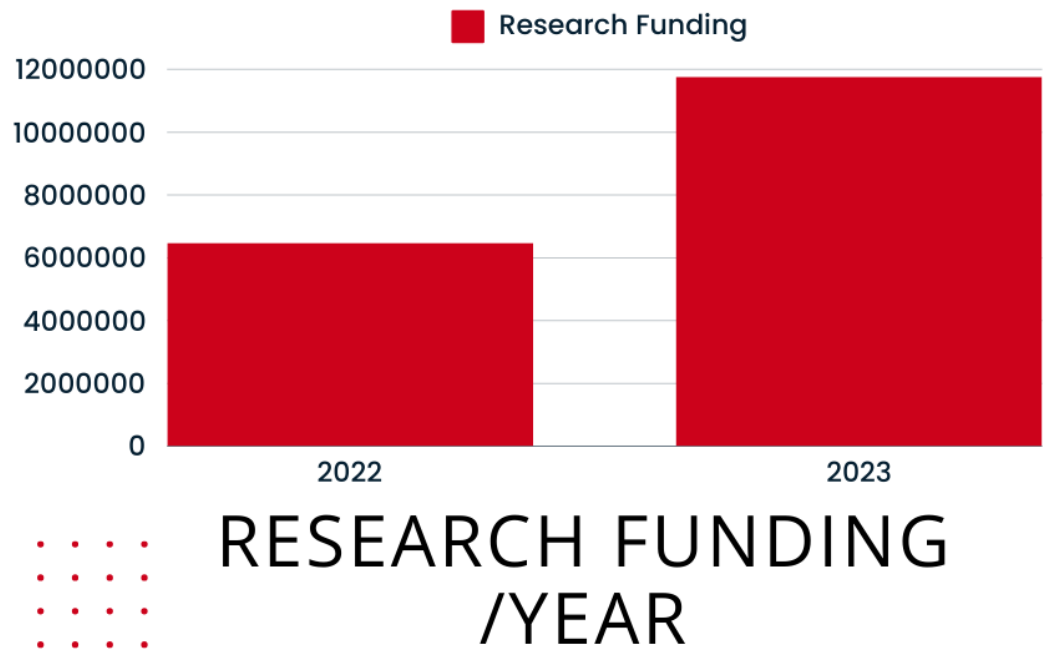
Photo credit: Khunkorn, Canva

This section provides a comprehensive overview dedicated to the lifeblood of innovation and progress within the Department of Pathology and Laboratory Medicine. In 2022-2023, our department has been the fortunate recipient of numerous grants that have not only fueled our research endeavors but have also significantly enhanced our diagnostic and therapeutic capabilities. These funding sources, ranging from federal agencies to private foundations, underscore the confidence and belief in our mission to advance the field of pathology and laboratory medicine.

Research

2022-23 Funding by Appointment Type





RESEARCH FUNDING /YEAR

Principal Investigator/Co-Investigators	Year	Funding Source	Total Awarded
Berenger, Byron (Clinical)			
Rapid RNA sequencing of coronavirus for Public Health surveillance and transmission	2022	University of Alberta	$19,000
Bismar, Tarek (GFT)			
Characterization of Novel Molecular Signature for Accurately Predicting Prostate Cancer Progression in Active Surveillance	2022-2023	Canadian Cancer Society	$168,479
GU Oncology Fellowship	2023	Janssen Inc.	$80,000
IOF for CFI # 14571	2023	Canada Foundation for Innovation	$1,094
Mutational Landscape of Unclassified Renal Cell Carcinoma	2023	Alberta Health Services / Alberta Precision Laboratories	$10,000
Box, Adrian (clinical)			
"Development of molecular testing for lung cancer biomarker (ROS) in Alberta Precision Laboratories"	2022	Calgary Health Foundation	$12,000
Bromley, Amy (GFT)			
Internal Audit of the Hospital Autopsy Service/ Impact of the SARS-CoV-2 Pandemic on Mortality as Encountered in a Hospital Based Autopsy Service - Dr. Nicole House	2022	Alberta Health Services / Alberta Precision Laboratories	$2,000
Chan, Jennifer/Charbonneau Institute (GFT)			
ACF Chair Funds for Pediatric Cancer	2022-2023	Alberta Cancer Foundation	$100,000
ACTION - Calgary Foundation - Five Year Commitment.	2023	Calgary Foundation	$150,000
ACTION Mechanisms to Medicines	2022-2023	Canadian Cancer Society	$1,071,150
Alberta Cellular Therapy and Immune Oncology Initiative (ACTION)	2022	Multiple Sources	$5,000
Arnie Charbonneau Cancer Institute Greatest Needs Fund	2022-2023	Multiple Sources	$148,251
Brain Tumour Research within the Arnie Charbonneau Cancer Institute	2022-2023	Multiple Sources	$30,925
Clark H Smith Integrative Brain Tumor Research Centre	2022-2023	Smith,Tony and Jane	$30,648
Cancer Outcomes Research Program - Oncology Outcomes (O2) Program	2023	Multiple Sources	$205,000
Cancer Prevention and Risk Reduction Research	2023	Multiple Sources	$250,000

Cancer and Genetic Research Fund	2022	Multiple Sources	$3,575
Charbonneau Biobank Donations	2023	Multiple Sources	$16,225
Childhood Cancer Research Program - 1	2022	Alberta Children's Hospital Foundation	$140,000
Donations to SACRI for supporting Cancer Research	2022	Multiple Sources	$49,397
Drivers of Oligodendrocyte Precursor Cell Dysfunction in the Origin and Maintenance of Olioodendroolioma	2022	Canadian Institutes of Health Research	$244,322
Emerging Cancer Scholars Program	2023	Multiple Sources	$591,150
Impact in Glioblastoma (Brain Cancer) Research	2023	Multiple Sources	$100
Kids Cancer Care Award in Childhood Cancer Research	2022	Kids Cancer Care Foundation of Alberta	$100,000
Lisa Shea Trainee Travel Award	2023	Shea, Lisa	$5,000
Lung Cancer Early Testing and Diagnostics	2023	Multiple Sources	$200,000
Lung Cancer Research within the Arnie Charbonneau Cancer Institute	2022	Multiple Sources	$3,525
MOHCCN Prairies Cancer Consortium (PR2C) - U of Calgary. MOH	2023	Terry Fox Research Institute	$2,655,100
Marathon of Hope Cancer Centres Network (MOHCCN)	2023	Multiple Sources	$247,922
Marathon of Hope Prairies Cancer Research Consortium (PR2C)	2022-2023	Terry Fox Research Institute	$1,514,025
Mechanisms of epigenetic evolution in pediatric high-grade gliomas	2022-2023	Canadian Institutes of Health Research	$258,060
Molecular Oncology and Cancer Immunotherapy Research Laboratories at the Calgary Cancer Centre	2023	Multiple Sources	$1,035,238
New Recruitment in Translational Hematology	2023	Alberta Cancer Foundation	$870,000
Oncology Outcomes O2 Infrastructure	2022-2023	Multiple Sources	$57,702
PROFYLE Model Systems Activities in Calgary - Partnered with Terry Fox Research Institute (TFRI)	2022	Alberta Cancer Foundation	$81,690
Precision Oncology for Young People: Biobanking and database development and coordination (PROFYLE)	2022	Terry Fox Research Institute	$25,000
Recurrent 3D genome features in PFA ependymoma	2023	Canadian Institutes of Health Research	$390,000
Rejeanne Taylor Research Prize in Precision Cancer Medicine	2022	Taylor, Robert W.	$55,000
Richardson Oncology Surgery Fund	2022	Richardson, Dale	$5,000

Robson DNA Science Centre	2022-2023	Calgary Foundation	$1,423,148
Rod Chisholm Memorial Fund for Glioblastoma Research	2023	Multiple Sources	$111,270
Southern Alberta Cancer Research Institute (SACRI) Cancer Genomics Program	2022-2023	Anonymous Donor	$2,508,987
The Cancer Data Platform	2022	Antje Graupe Pryor Foundation	$500,000
The Prairie Cancer Research Consortium (PCRC) - Pilot Project	2022-2023	Terry Fox Research Institute	$309,375
The evolution of transcriptional cellular state dynamics in recurrent glioblastoma	2023	Terry Fox Research Institute	$45,000
Training Tomorrow's Leaders in Hematology	2023	Alberta Cancer Foundation	$100,000
Hyrcza, Martin (GFT)			
Head and Neck Tumour Banking Program	2022	Calgary Foundation	$25,000
Trainee-Led Projects Support Initiative (TLPSI)	2023	Alberta Health Services / Alberta Precision Laboratories	$145,000
Kelly, Margaret (GFT)			
Multiplexed Ion Beam Imaging (MIBI) Technology	2023	Alberta Children's Hospital Foundation	$400,000
Khan, Faisal (GFT)			
5+14=0: A new maths based on KIR genes to reduce Graft versus host disease after allogeneic HCT	2022	Buckley Family Foundation	$1,000
Early Detection of Acute Myeloid Leukemia Relapse after Hematopoeitic Cell Transplantation	2022-2023	Alberta Cancer Foundation	$371,500
Koebel, Martin (GFT)			
A Population Based Study of Ketorolac and Ovarian Cancer Survival	2023	University of Colorado Denver	$14,038
A Population Based Study of Ketorolac and Ovarian Cancer Survival	2022	University of New Mexico	$6,873
Mansoor, Adnan (GFT)			
Proteomic validation of Transducin beta-like 1 X-linked receptor 1 (TBL1XR1) gene expression in aggressive B-cell lymphomas arising at immune privileged sites	2023	Alberta Health Services / Alberta Precision Laboratories	$4,946

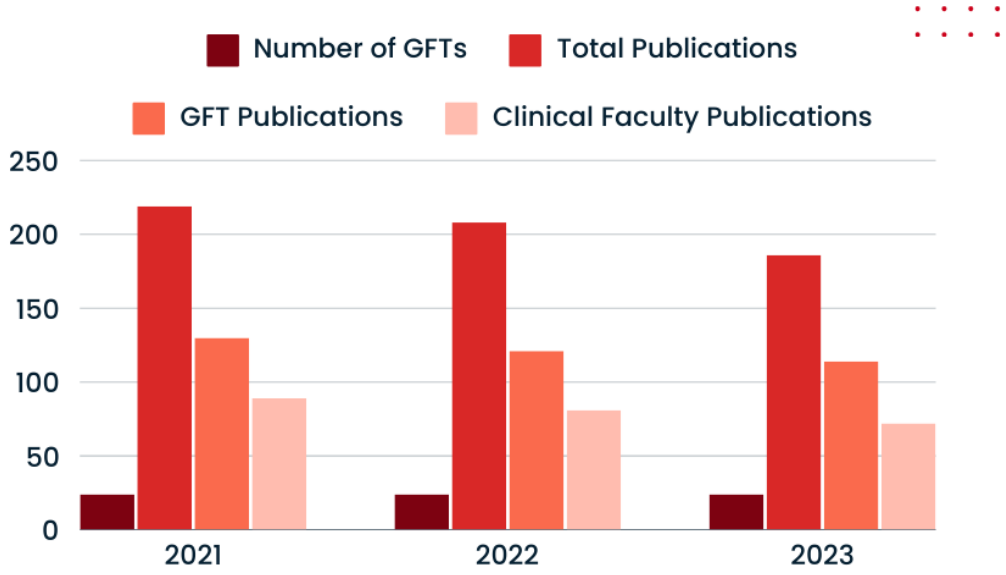
Minoo, Parham (Clinical)			
Appendiceal Mucocele: A preneoplastic lesion for mucinous neoplasm?	2023	Alberta Health Services / Alberta Precision Laboratories	$7,452
Nohr, Erik (GFT)			
Advanced Stage Lung Adenocarcinoma: Assessing Liquid Cytology Molecular Biomarker Testing	2023	AstraZeneca Canada Inc.	$49,969
Orton, Dennis (Clinical)			
Defining an optimal IGF-1 concentration in children undergoing in Treatment of Growth Hormone Deficiency	2022	Pfizer Canada	$205,850
Pillai, Dylan (GFT)			
A multi-disciplinary approach for the development of a point of care solution for the detection of SARS-CoV-2	2022	Deep Biologics Inc.	$48,924
Combating Antibiotic Resistance in Philippine Lakes: One-Health upstream interventions to reduce the burden	2022-2023	Canadian Institutes of Health Research	$329,932
LAMP to detect malaria in pregnancy (LAMPREG)	2022-2023	Grand Challenges Canada	$310,000
Quantification of SARS-CoV-2 viral load in clinical and environmental samples	2022	Canada Foundation for Innovation	$24,452
The Alberta Diagnostics Ecosystem Platform for Translation (ADEPT)	2023	Alberta Innovates	$235,000
Pitout, Johann (GFT)			
Genomic epidemiology of Escherichia coli ST167 with carbapenemases	2023	Alberta Health Services / Alberta Precision Laboratories	$4,760
The Molecular Basis of the Carbapenem Resistance Epidemic	2022	Hackensack Meridian Health	$68,322
Zargham, Ramin (Clinical)			
Characterization of alpha 8 integrin as a novel prognostic factor for invasive breast ductal carcinoma	2022	Alberta Health Services / Alberta Precision Laboratories	$10,574
SWI/SNF defected Lung Adenocarcinoma	2022	Alberta Health Services / Alberta Precision Laboratories	$11,774
Zhang, Kunyan (GFT)			
Center for Antimicrobial Resistance (CAR)	2022-2023	Alberta Health Services / Calgary Health Region	$135,000

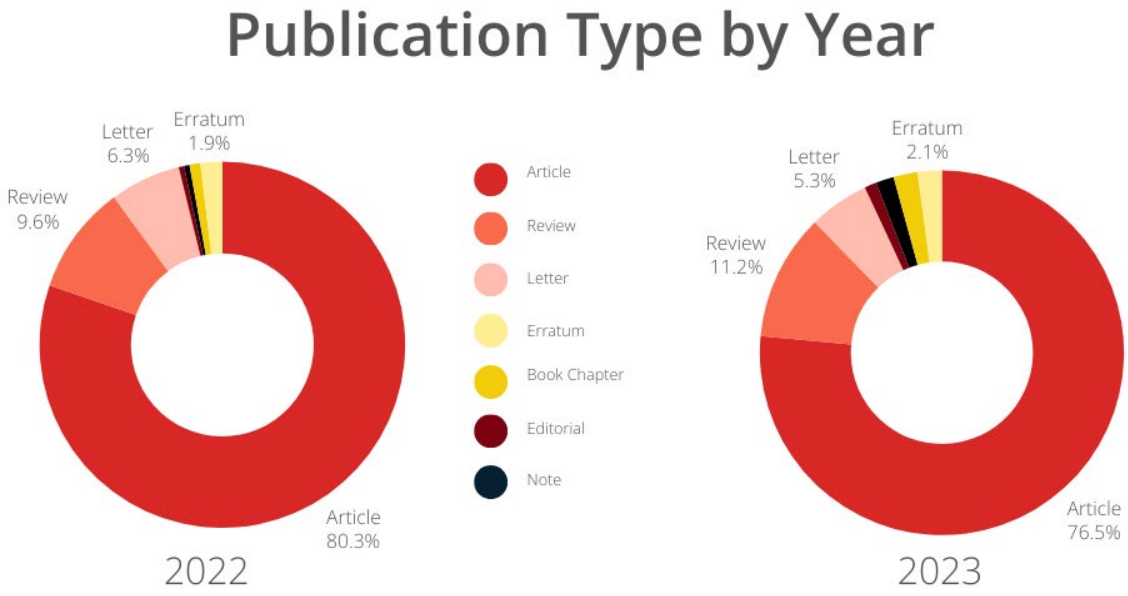
Publications

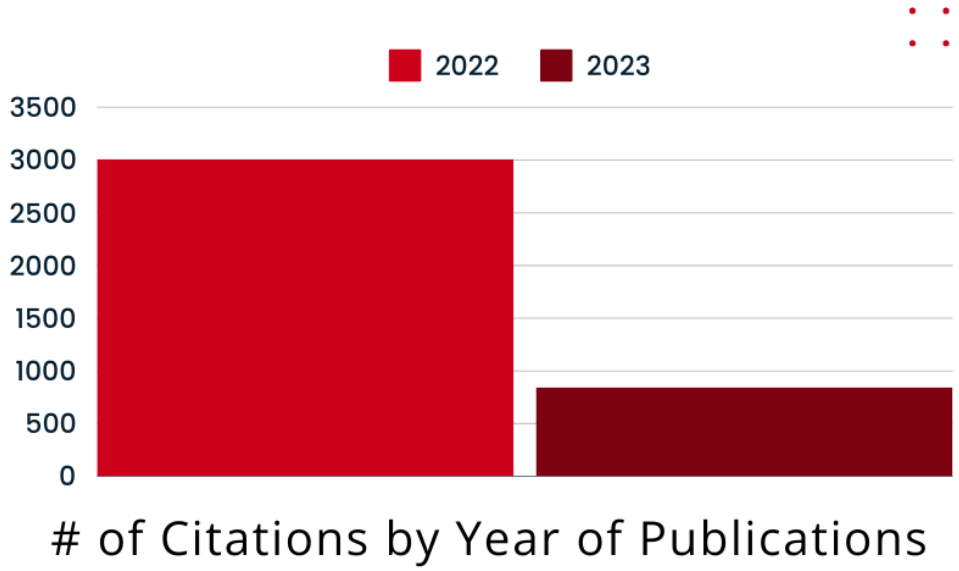
Photo credit: Fedor Kozyr, Getty Images via Canva Pro

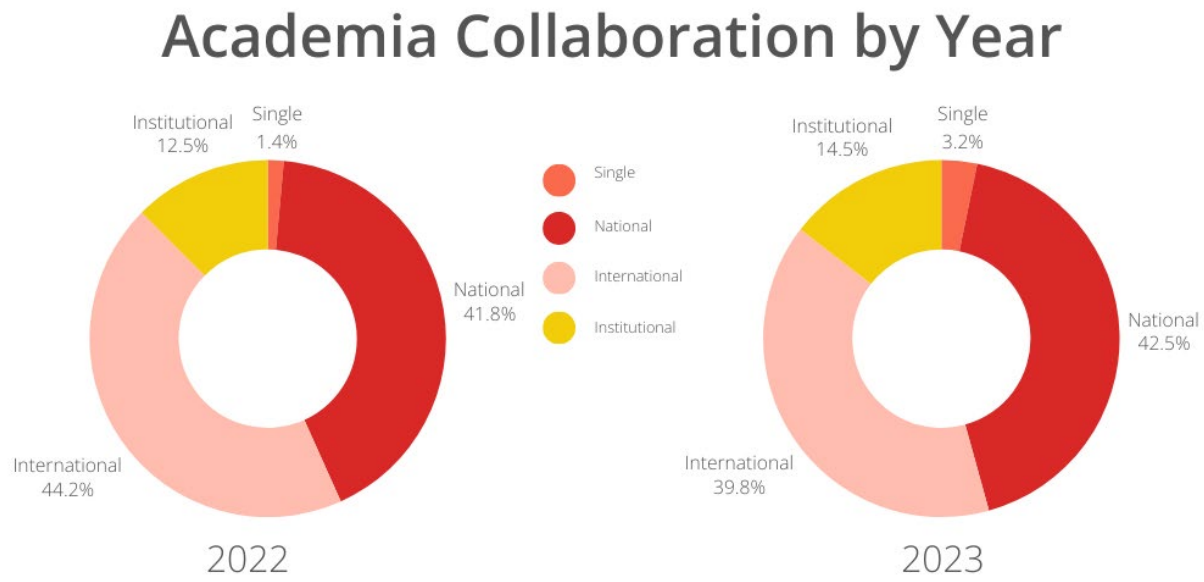
This section is a testament to our department's unwavering commitment to advancing medical knowledge and fostering an environment of scholarly excellence. Over the 2022-2023 period, our faculty, researchers, and students have contributed significantly to the field of pathology and laboratory medicine through a diverse array of publications. These works not only highlight our department's expertise and innovative research but also underscore our role in shaping the future of healthcare.

Publications (* indicates First or Last Author)









Abdullah, Amid

1. de Koning, L., Orton, D., Seiden Long, I., Boyd, J., Kellogg, M., **Abdullah, A.**, Naugler, C., Tsui, A., Strange, B., & Glaser, D. (2023). Distribution of videos demonstrating best practices in preventing hemolysis is associated with reduced hemolysis among nurse-collected specimens in hospitals. Clinical Biochemistry, 119, 110632. https://doi.org/10.1016/j.clinbiochem.2023.110632

2022

19.85	15	55	3
hindex	# Pubs As First Author	# of Pubs As Last Author	# of Pubs As Single Author
1.55	208	2365	
Field Weighted Citation Impact	# of Unique Publications	Citations	

2023

19.94	25	62	6
hindex	# Pubs As First Author	# of Pubs As Last Author	# of Pubs As Single Author
1.41	186	734	
Field Weighted Citation Impact	# of Unique Publications	Citations	

Collaboration Countries

Al-Shamma, Zainab

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