

Department of Pathology &
Laboratory Medicine, FOM, UBC

ANNUAL REPORT

2023-24

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01

EXECUTIVE COMMITTEE



YEAR IN REVIEW



As we reflect on the past year at the Department of Pathology and Laboratory Medicine, it is inspiring to witness the strides we have made across research, education, and clinical service. This report highlights the collective achievements of our dedicated faculty, staff, and students, underscoring our commitment to excellence and innovation. It is a testament to the hard work and perseverance of our entire department as we continue to advance the frontiers of medicine and science.

This is the link to our [organizational chart](#) from 2023:

Thanks to the collective efforts of our finance team (Genevieve MacMillan, Linda Yang, Eric Toh, Lucas do Livramento) and the support of all stakeholders, our department has successfully addressed the structural deficit, significantly improving our financial stability. This achievement allows us to enhance support and mentorship for our clinical faculty and to initiate succession planning for academic faculty.

This year, our department saw substantial growth and recognition in both clinical and academic spheres. Across the province, 38 clinical faculty members were recruited to different hospital sites, and 3 research faculty members were recruited into research institutes. Five senior faculty members retired, and 18 faculty members were promoted, including 2 tenured faculty promotions and 16 clinical academic faculty promotions. Our faculty members have been honored with numerous prestigious awards, including four of the sixteen most prestigious Faculty of Medicine Distinguished Achievement Awards. For the full list of awards and detailed descriptions, please refer to the awards section of this report. Congratulations!

On the educational side, we celebrated the graduation of 5 residents, 6 clinical fellows, 6 PhD students, 11 Master's students, and 14 BMLSc students. Curriculum upgrades are well underway in our BMLSc program, graduate program, and infection prevention and control certificate programs. On the research side, our department successfully

obtained 125 new research grants (78 grants as PI, 47 grants as co-PI), totaling over \$41 million. Our faculty published over 610 peer-reviewed articles and delivered thousands of hours of lectures globally.

It is time to celebrate what we have collectively accomplished in the past year. It is time to reflect on what we have learned during our journey. It is also time for us to evaluate the new reality and plan our future endeavors. As the implementation of our strategic plan continues to unfold, I look forward to working with all of you to achieve even greater levels of accomplishment and impact in the year to come!

Zu-hua Gao, MD, PhD, FRCPC, FCAHS
Professor and Head

A handwritten signature in black ink, reading "Zu-hua Gao". The signature is written in a cursive, flowing style.



VICE CHAIR OF RESEARCH

Dr. Cheryl Wellington

STRATEGIC INITIATIVES

Pathology Grant Application Practicum (PGAP):

This 4-month interactive practicum covered a variety of topics in the domain of preparation and evaluation of competitive grant proposals. Each two-hour hybrid session addressed critical aspects of generating a competitive research grant proposal. Sessions were tailored for early career faculty, clinical faculty new to research, and senior trainees in a transitional role. Using didactic and interactive methods, workshop participants could choose to submit a seed grant application or serve in a grant application reviewer role. The overall objective was to provide critical core skills training for PALM faculty and trainees that complemented their program-specific objectives and facilitated synergy among PALM academics and clinicians. In this inaugural 2024 cycle, 2 collaborative seed grants of \$15,000 were awarded from a total of 4 applications received. The grant application practicums were awarded to Maziar Riazzy and Shannon Healy. Informal



feedback from PGAP participants was overwhelmingly positive, and plans are underway to ensure the sustainability of this program and expand its reach. This activity directly supported the first Moving to Action aim for Research, namely, to strengthen clinically relevant research capacity and capability and build connections between clinical research and fundamental science.

Researcher Dashboard:

Led by Sneha Dabgar, we have developed the first iteration of a Researcher Dashboard that enables both the department and individual investigators to track their research grant successes over a 10-year period. By including both the number of applications filed (through the Office of Research Services) as well as number of applications awarded, success rates can be tracked by investigator, research site, gender, career stage, and more. We aim to have this Dashboard be a user-friendly way to support identification of strengths and weaknesses in research across our Department, and for investigators to help prepare their annual Activity Reports as well as applications for

Moving to Action aim for Research, namely, to strengthen the resources required for world-class research.

Biobanks:

Led by Debbie Bertanjoli, we have successfully gathered information about biobanks held by our Departmental Faculty members. This project has explored methods to increase

access to and use of human tissue and fluid specimens, as well as collected information on research interests, available equipment, and supervision. It may now become a priority for future support for staffing and infrastructure expenses through the new Canada Foundation for Innovation Core Facility Stream. For more details, please visit: <https://pathology.ubc.ca/academic-faculty-research-interests>.





VICE CHAIR OF SCIENTIFIC EDUCATION

Dr. Hélène Côté

PALM Annual Report for Scientific Education in the Bachelor of Medical laboratory Science (BMLSc) and the Graduate Studies Programs

STRATEGIC INITIATIVES

Scientific Education in PALM has started addressing the strategic priorities of its 5-year strategic plan through the development of a database of teaching activities within named courses in PALM and by PALM faculty. Various actions and initiatives have also been undertaken, including:

Bachelor of Medical Laboratory Science (BMLSc):

01. Established a BMLSc Executive/ curriculum committee with broad representation from academia, provincial labs, and industry which will advise the program and make recommendations on policies and curriculum.
02. Implemented a BMLSc Co-op program which has been approved by UBC Senate.
03. Carried out a Search to recruit a



new Assistant or Associate Professor of Teaching who will also assume the position of Director for the BMLSc Program.

04. Facilitated in-house events to introduce extra-curricular opportunities by collaborating with other units on campus (e.g. Go Global, Career Services, and Enrolment Services).
05. Implemented several strategies to network and advertise the BMLSc Program, to reach a broader range of potential applicants (e.g. Indigenous Experience UBC, Online Info Session).
06. Held the Vancouver Summer Program and hosted 31 international students.
07. Started the development of a new BMLSc course in Modern Pathology technologies.

Graduate Programs:

01. Held Round Table consultation about

curriculum needs within the Program.

02. Developed several new courses and updated existing curriculum to include teaching around Big Data analysis and visualization, machine learning, genomic and single cell analysis, and the use of R.
03. Established an Alumni Engagement Committee.
04. Surveyed broadly with student and supervisors in the PALM Graduate Studies Program and revised the format of the PALM Comprehensive exam to allow students to develop grant application ideas more closely related to their thesis project.
05. The PALM Student Association (PaSA) organized several professional development activities and social events for graduate students and post-doctoral fellows.

RESEARCH AND EDUCATIONAL HIGHLIGHTS

2023 Achievements:

Several BMLSc students honed their research skills in PATH 438 Directed Studies and 4th-year BMLSc students hosted a student-led panel discussion with 3rd-year students to share their experiences in finding their research supervisors. Trainees in the Graduate Program received several external awards including a Vanier Award, 4 CGS-Doctoral and 4 CGS-Master awards. Together, as of April 2024, the graduate students in the PALM Graduate Studies program have received over \$2.75 million in competitive awards/scholarships over the course of their graduate studies.

EQUITY, DIVERSITY AND INCLUSION (EDI) EFFORTS

The BMLSc Student Resources was updated with UBC's EDI resources. The BMLSc also expanded its outreach to prospective students in rural BC by offering an online info session in addition to the in-person one. The BMLSc implemented an expedited admission review for Indigenous applicants which resulted in two early admission offers for September 2024. Both the BMLSc and Graduate Studies Program are currently fairly diverse with a majority female and/or racialized students.

COMMUNICATION AND OUTREACH

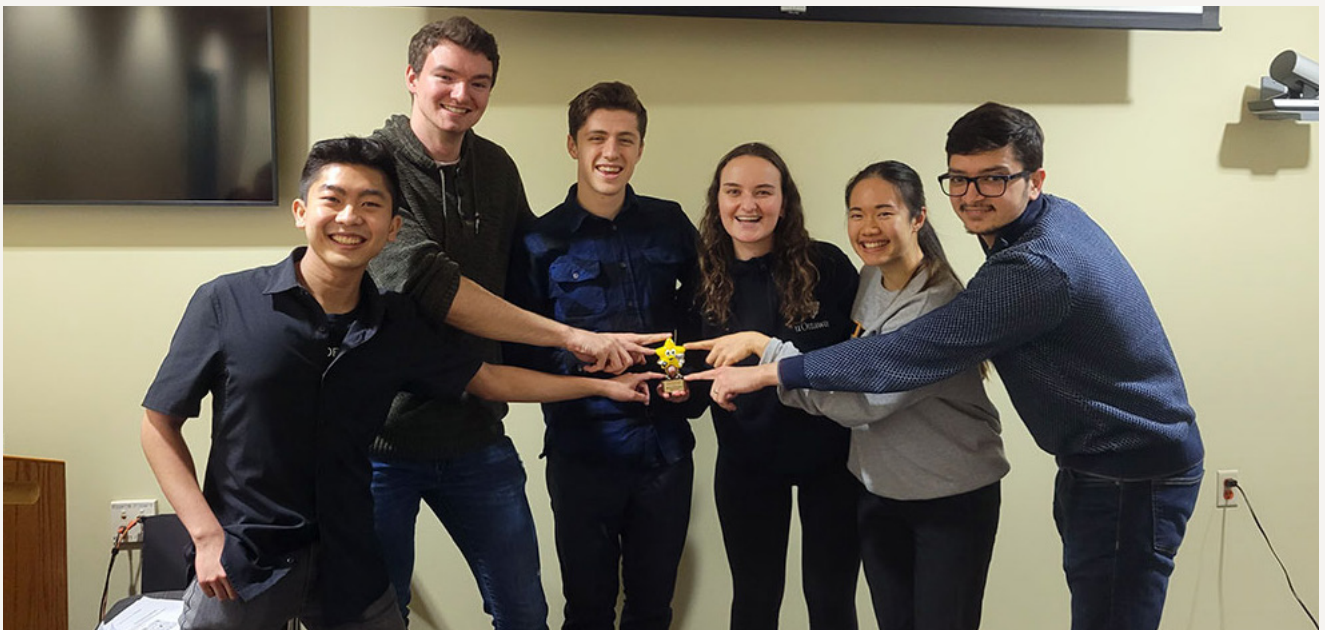
2023 Outreach and Engagement

Highlights:

The BMLSc Program held an alumni reunion attended by over 30 participants. The PALM Graduate Program Alumni Engagement Committee held its first-ever reunion of PALM Graduate Program Alumni on May 16th. BMLSc students were featured in both the FoM Back to School and International Women's Day features (<https://www.med.ubc.ca/news/back-to-school-2023>, <https://www.med.ubc.ca/news/international-womens-day-2024/>).

PALM graduate students were featured on several occasions, including on the UBC G+PS website (<https://www.grad.ubc.ca/campus-community/meet-our-students/povshed-na-tetiana>) and the Centre for Blood Research Newsletter (<https://cbr.ubc.ca/behind-the-science-improving-the-health-of-women-living-with-hiv/>).







VICE-CHAIR OF CLINICAL EDUCATION

Dr. Mike Nimmo

In keeping with the department's strategic plan, we have focused on three key items related to health human resource planning and education. Drs. Aleks Stefanovic, Titus Wong, Ghada Al Rawahi, and Annie Lin have been revamping the Certificate in Infection Prevention and Control into an online course that will help the health authorities prepare new Infection Prevention and Control Professionals. We anticipate the new course will be available in the fall of 2025. The department is working with the Faculty of Medicine to obtain government support and funding for both a Pathology Assistant Master's Program and a two-year fellowship program for clinical PhDs.

PATHOLOGY AND LABORATORY MEDICINE RESIDENCY TRAINING PROGRAMS

The Diagnostic and Molecular Pathology (DMP) program, formerly known as Anatomical Pathology after a Royal College discipline name change, had four PGY5 residents successfully complete their oral examinations. These residents have taken fellowship training at various sites: Dr. Ardalan Akbari – Women's and Perinatal Pathology at Brigham and Women's Hospital; Dr. Jamie Lee – Renal Pathology at Cedars-Sinai; Dr. Collin Pryma – Cardiovascular Pathology at Mayo Clinic; and Dr. Deepak Toor – General Surgical Pathology at Houston Methodist.



The DMP successfully matched all four spots through the CaRMS match cycle, including three residents from the UBC medical school ecosystem. In efforts to engage sites outside of Vancouver, the DMP program introduced an additional exam in 2023, which will be administered annually and will consist of examiners from across BC putting our current residents through a full mock Royal College oral examination. The DMP program has also condensed the clinical training for residents during their PGY1 year, allowing residents to become fully immersed in their pathology training six months sooner than in previous years. With this accelerated training timeline, the DMP program has also developed dedicated sub-specialty training blocks for final-year residents, where they can receive specialized training in an Area of Special Interest, which will be recognized by the PGME office.

1. Physical Space Changes:

The Department of Pathology and Laboratory Medicine training sites across Vancouver have seen a significant impact due to space redevelopments and reassignments that so

far are placing a great burden of stress on the residents. The most pressing change has been the DPLM design at Vancouver General Hospital which has resulted in a significant displacement of residents from the Diagnostic and Molecular Pathology, Hematopathology, and Neuropathology training programs. The residents have been moved away from the main laboratory area which has resulted in increased passage of patient material back and forth through public hospital areas, and increased time away from clinical and educational activities in order to check on cases being ready for review as well as following up on additional sections or special studies.

The residents have also lost space for food and beverage, resulting in residents not being able to work while they have a meal, again reducing the productivity and learning opportunities. Inter-resident education is very important to help grow the knowledge base of junior residents and develop communicator and collaborator skills for senior residents; these skills are hindered with the loss of teaching space such as a multi-head microscope where activities such as this typically occur. Lastly, the residents are no longer near to the staff pathologists which removes the 'shadowcurriculum' in pathology training, where informal discussions and teaching occurs when staff and residents pass by each other or have a spur-of-the-moment interesting case. There are major concerns for the residents being able to return to their previously occupied space in the lab after the redevelopment has completed, which has provided a significant impact on resident well-being currently, and likely has played a significant impact in resident recruitment

in the most recent match. The case material and staff pathologists are second to none across all three disciplines at VGH, but without a fully supportive physical space, the UBC residency programs will be limited in their ability to reach their full potential. In addition to the redevelopment at VGH, the DMP and HP programs are facing significant space constraints at BC Cancer Agency which has resulted in our residency program having to re-assess how many residents can access the case material and staff expertise at BCCA at any given time. Both programs use this site as a main teaching hub for molecular pathology, arguably one of the most important aspects of pathology practice in today's environment.

Additionally, BCCA provides DMP residents with opportunities to learn and excel in various fields not available at other sites, which is not only critical for developing skills for practice but also for successful completion of the Royal College examination. Although other sites are being explored to offset some of these changes at VGH and BCCA, including Surrey Memorial, Royal Columbian, Victoria, and other hospitals, they themselves are not in a position to take more than one resident, if at all, at any one time. A concerted effort to provide office space for resident trainees in all disciplines of pathology is crucial, and may have long lasting effects on UBC's ability to recruit and retain pathology residents, who can and want to provide equitable and accessible pathology services throughout BC.

2. Technological Changes in Training:

The residency programs at UBC are significantly behind the emerging, and in some cases standard of care, workflow of digital pathology. Although we provided residents



with examinations in order to help prepare for their examinations in digital pathology, residents across the field do not have access to routine diagnostic care using digital pathology which is becoming more and more a standard work practice in the world. Residents are not able to learn and practice in the field of Clinical Informatics, which comes together with digital pathology. For the UBC programs to attract the best and brightest residents, we will need infrastructure support to implement these workflow techniques and educational paradigms, which will in turn expand the skillset of residents as they move into clinical practice and improve the care of patients throughout BC. Currently, the DMP program is looking at providing their residents an educational course through the American Society for Clinical Pathology on pathology informatics, however the content is often out of scope for the Canadian laboratory landscape and is quite expensive. A homegrown solution is beginning to be planned but is still several years away from being prepared as a fully imbedded curriculum in the residency training program.

3. Resident Feedback

The residents within the DPLM programs are often top-caliber residents who are self-driven and seek out ample opportunities to further enhance their educational experience. The residents' have repeatedly voiced that, although they are able to self-source most of the few shortcomings that are present in the program currently, they are most concerned about the two points previous: the physical space and digital pathology access.

Support for research: Residents can partake in a wide variety of research; however, they are limited in terms of support to submit ethics applications and other research administration services. Staff often rely on residents to manage these aspects of pathology, but little administrative support is possible. The VGH

DPLM does provide some research support on a cost-recovery basis for technical needs, which the residents are able to access through funds from the program.

Acknowledgment: *Special thanks to Dr. John Bush, AP Residency Program Director, and Genevieve MacMillan for their significant contributions to this report.*



Diagnostic & Molecular Pathology Residents



Medical Microbiology Residents at Grad Dinner



Residency Grad Dinner

DIRECTOR OF COMMUNICATIONS

Dr. David Huntsman

Our department has continued to prioritize effective communication to enhance collaboration, education, and engagement within our community and beyond. This report highlights our key communication tools, capabilities, and goals.

COMMUNICATION TOOLS AND PLATFORMS

Our department leverages multiple communication tools to ensure information is effectively disseminated:

Bi-Weekly Bulletin: Our bi-weekly bulletin is essential for keeping our community informed about departmental activities, achievements, and upcoming events. You can access the bulletin archive [here](#).

Social Media Engagement: We actively use social media platforms to share our work and engage with a broader audience. Follow us on:

- [Twitter](#)
- [Instagram](#)
- [LinkedIn](#)

Annual Events: In 2023, we held our Annual Seasonal Celebration on January 18, providing a time for reflection and connection among our faculty, staff, and students. Additionally, our annual Pathology Day Con-



ference took place on June 1, featuring a series of presentations and discussions on the latest advancements in pathology. More information on Pathology Day 2023 can be found [here](#).

Website: Our department's website serves as a comprehensive resource for information on our programs, research, and events. Visit us at pathology.ubc.ca.

Annual Report / Pathology at a Glance: Every year, we produce the "Annual Report / Pathology at a Glance" to provide a comprehensive overview of our department's achievements and activities. The report for 2022 is available [here](#), offering detailed insights into our progress and milestones.

Weekly Grand Rounds: Our weekly Grand Rounds continued to be a cornerstone of our educational offerings, bringing together internal and external experts to present on a variety of topics.

On the following page, you will find highlights from 2023.



WEEKLY GRAND ROUNDS 2023

DEPARTMENT BUSINESS



Dr. Zu-hua Gao:
"Transform the Future of
Pathology and Laboratory
Medicine"



**Dr. Hélène Côté and Dr.
Michael Nimmo:** "Clinical/
Scientific Education aspect
of our Department Strategic
Plan"



Dr. Suzanne Vercauteren:
"Pathology and Laboratory
Medicine at BCHHR"Plan"



Dr. Cheryl Wellington:
"Vice Chair Research,
Department of Pathology
and Laboratory Medicine:
First Year Review"



**Dr. Michelle Wong and
Dr. Carolyn Shiau:** "Better
together: the people,
programmes, and services
of the lab in Fraser Health"



Dr. Gang Wang: "David
Hardwick Pathology
Learning Centre"Plan"



Dr. Lucy Perrone: "CMPT: A
Clinical Service and External
Quality Assessment Partner
for Laboratories Performing"



Dr. Agatha Jassem:
"Clinical Scientists in
Action"

RESEARCH



Dr. Ying Wang:
"Characterizing
atherosclerosis at the
molecular level to improve
treatment outcome of anti-
inflammatory therapies"



Dr. Citlali Márquez:
"Using the power of
serological multiplex
assays to track COVID-19"



Dr. Corree Laule:
"Characterizing human
brain and spinal cord
microstructure with
quantitative MRI and
histology"



Dr. Philipp Lange:
"Canada's path towards
proteome guided therapies
and advanced molecular
pathology in precision
oncology"



Dr. Aly Karsan: "The
Role of Noncoding Genes
in the Pathogenesis and
Vulnerabilities of Myeloid
Cancers"















Dr. Honglin Luo:
"Mastering Immune Chaos:
Strategic Interventions
for Viral Myocarditis
via Innate Pathway
Modulation"



Dr. Kevin Kuchinski:
"Hunting for bird flu in the
mud: genomic surveillance
of avian influenza viruses
using environmental
specimens from wetland
habitats"



Dr. Ly Vu: "Targeting RNA
modifications in Myeloid
Leukemia"

CLINICAL	 <p>Dr. Veronica Hirsch-Reinshagen and Dr. Mike Nimmo: "Scientific method and a book of spells: Bringing neurological and systemic autoantibody testing to BC"</p>	 <p>Dr. Susan Porter: "Changing Paradigms of Graduate Education in the 21st Century"</p>	 <p>Dr. Audi Setiadi: "Capturing the Immune System: Implementation of the Flow Cytometry Panels for Immunodeficiency at BC Children's Hospital"</p>	 <p>Dr. Deepu Alex: "Optimal histological assessment of tumor tissue for molecular testing and biomarker evaluation"</p>
	 <p>Dr. Wolfgang Kern: "From Data to Diagnosis: Machine Learning and AI enhance Hematologic Neoplasm Detection in the Pathology Lab"</p>	 <p>Dr. Mike Nimmo: ""High" Volume Autoimmune Testing in BC –An Overview Part 2"</p>	 <p>Dr. Muhammad Mamdani/ Dr. Anmol Verma: "T-CAIREM: Creating a Community for AI in Medicine"</p>	 <p>Dr. Guillaume Pare: "Use of Multi-omics to Gain Insights Into Health and Diseases"</p>
	 <p>Dr. Tyler Smith, Hematopathology (moderator); Dr. David Huntsman, Molecular and Genomic Pathology; Dr. Daniel Holmes, Medical Biochemistry; Dr. Marthe Charles, Medical Microbiology; Dr. Andrew Shih, Transfusion Medicine: "CCharacterizing atherosclerPanel Discussion – Laboratory Medicine and Private Industry"</p>	 <p>Dr. David Goldfarb, Medical Microbiologist, BCCH; Dr. Lien Hoang, Anatomic Pathologist, VGH; Dr. Veronica Hirsch-Reinshagen, Neuropathologist, VGH; Dr. Shazia Masud, Medical Microbiologist, Fraser Health; Dr. Danielle Meunier, Hematopathologist, Island Health; Dr. Tyler Smith, Hematopathologist, VGH (moderator) "Panel Discussion on Career Planning and Job Applications"</p>	 <p>Dr. Andre Mattman: "Practicing Pathology in a CODE RED for Humanity"</p>	 <p>Dr. Lucy Perrone: "So You Want to Run a Clinical Laboratory? Key Considerations and Opportunities for Aspiring Practitioners"</p>
	PALS			



DIRECTOR, EQUITY, DIVERSITY AND INCLUSION

Dr. Suzanne Vercauteren

The Department's Equity, Diversity, and Inclusion initiatives focus on two key areas: increasing Indigenous representation and improving the diversity of our academic faculty. We know from our Inclusion Action Survey, that the department is under represented by indigenous people. Two of our faculty members have taken initiatives to address this by creating opportunities for indigenous children and youth to obtain experience in science.

Corree Laule and Cheryl Niamath's seed2STEM summer science research program for Indigenous Youth was awarded the Faculty of Medicine's Strategic Initiative Fund as well as UBC's STEM funding and a private donation.

The seed2STEM summer science research program for Indigenous youth invites high school students from grades 9 to 12 to participate in paid, six-week summer research internships covering various STEM topics. In addition to earning minimum wage for working 25 hours per week, students engage in weekly research-focused learning modules, hear from guest speakers (including individuals living with spinal cord injuries, STEM professionals, and Indigenous community members), and visit local scientific and cultural sites on field trips.

This program started in 2018 with one student and expanded to 17 students that participated in 2023. We have also focused on the diversity of our academic faculty. Pathology and Laboratory Medicine has historically been under represented by female faculty members, however, this is starting to change. Two years ago, 30% of



the Assistant Professors, tenure track were female. Based on the recruitments in 2024/25 and that two clinical faculty member, Drs. Julia Nasso and Lien Hoang who are on a protected research time program aimed at moving towards academic appointments, 43% of the Assistant Professors are female. As well, the Department successfully supported Dr. Yasir Mohamud in obtaining the inaugural CIHR Research Excellence, Diversity and Independence (REDI) Early Career Transition Award that supports early career academics who have been under represented in academic careers. Pathology and Laboratory Medicine also submitted a nomination for a CRC Tier II for young academics that have a disability. We hope this diversity trend will continue while we keep striving to select the most suitable candidates.

The Pathology and Laboratory medicine award committee added an award for equity, diversity and inclusion to its awards. It recognizes the efforts of faculty members, learners, staff, postdoctoral scholars, and staff who contribute to an equitable, diverse, inclusive culture in the Department of Pathology and Laboratory Medicine at UBC. The first award will be presented at Pathology Day 2024.

02

ASSOCIATE
DEPARTMENT
HEADS



ASSOCIATE ACADEMIC DEPARTMENT HEAD FOR FRASER HEALTH

Dr. Michelle Wong



Fraser Health Laboratories have had another busy and productive year in 2023 with multiple region-wide projects ongoing across all disciplines. As the largest regional health authority in BC serving close to 2-million people with our 1300 laboratory staff, we continue to consider how we can support the ever-evolving clinical service delivery and training of more technical and medical learners while navigating staffing challenges and unprecedented growth.

DIGITAL TRANSFORMATION

Fraser Health has embarked on its digital transformation journey, moving from Meditech Client Server to Meditech Expanse at 3 of 12 hospitals (Eagle Ridge Hospital, Fraser Canyon Hospital, and Mission Memorial Hospital), with many more sites to make this transition over the coming years. This is being done in concert with numerous hospital site expansions at Burnaby Hospital, Royal Columbian Hospital, New Surrey Hospital (Cloverdale), and the recently announced expansion for Surrey Memorial Hospital. Over the next 10

years, this will add an additional 30% acute site bed capacity to the region and result in many opportunities for our team!

STRATEGIC GROWTH AND I-CARE MODEL

As we consider how best to prepare for this growth, the lab team is challenging each discipline to consider how we can leverage technology and collaborate to support our I-CARE strategic model (integration, consolidation, automation, reduction, and elimination of lab test volumes). This has led to multiple exciting projects that are either currently in progress, including:

Medical Biochemistry:

01. Deployment of Remisol Middleware 2.0 and new chemistry analyzers in preparation for installation of automated lines for Abbotsford Regional Hospital and Cancer Centre, Burnaby Hospital, Royal Columbian Hospital, and Surrey Memorial Hospital. Middleware allows us to provide remote technical support across lab sites. We are also leveraging expansion of auto-validation for specific tests – resulting in significant saving for technologist time and an ability to make urgent results available to the patient and provider in a timely manner.

Hematopathology:

02. Advancing technology through Digital Imaging Analyzers and CellaVision version 7, supporting review of blood films and leveraging AI within the platform's software to support assessment and allow for remote medical support.

Microbiology:

03. The renovation at the Surrey Memorial Hospital consolidated the micro laboratory for Fraser Health, expanding the capacity of the blood culture analyzer. Additionally, the facility transitioned from manual to molecular diagnostics for numerous pathogens.

Pre and Post Analysis:

04. Deployment of Positive Patient Identification (PPID) across all sites in Fraser Health, allowing for on-demand label printing by our lab assistant staff per-



forming phlebotomy and improved quality by reducing wrong-blood-in-tube errors.

Anatomic Pathology:

05. The regional department, in a joint collaboration with the Royal Columbian Hospital Foundation and breast pathologists at RCH, has successfully validated dual chromogenic in situ hybridization (DISH) testing for HER2. This advancement benefits breast cancer patients by providing more accurate diagnostic testing.

This will support the BC 10-year Cancer Action Plan with breast cancer patients having all diagnostic information available at time of first appointment with a specialist. More information can be found [here](#). The Anatomic Pathology team has also been working on building CoPath, which will be deployed simultaneously with Meditech Expanse as Fraser Health continues through its digital transformation.



ASSOCIATE ACADEMIC
DEPARTMENT HEAD FOR THE
ISLAND HEALTH

Dr. Julie Irving

Approximately 45 laboratory medicine physicians actively practice in Island Health, 29 (64%) of whom hold UBC clinical faculty appointments. Almost half are anatomical pathologists at the Royal Jubilee Hospital in Victoria, and of these, 42% are at the rank of clinical instructor (see Tables 1 and 2).



Table 1. Number of Laboratory Medicine physicians in Island Health with UBC Clinical Faculty appointment/total number staff.

	Anatomical Pathology	Hematopa- thology	Medical Microbiology	Biochem.	Forensic Path	Cytogenet.
South Island (Royal Jubilee and Victoria General Hospitals)	14/14	2/7 (*5 data not known)	4/5	1/2	1/1	1/1
Center Island (Nanaimo Regional General Hospital)	3/10	1/2	n/a	n/a	n/a	n/a
North Island (Comox Valley and Campbell River Hospitals)	1/2	1/1	n/a	n/a	n/a	n/a

Table 2. Total number (percentage) of Laboratory Medicine physicians in Island Health by clinical rank.

	Anatomical Pathology	Hematopa- thology	Medical Microbiology	Biochem.	Forensic Path	Cytogenet.
Clinical Instructor	11 (42%)	1	2 (40%)	0	0	1
Clinical Assistant	5 (19%)	1	0	1	1	0
Clinical Associate	2 (8%)	1	0	0	0	0
Clinical Professor	0	1	2 (40%)	0	0	0
Not clinical Faculty	8 (31%)	1 (*5 data not known)	1 (20%)	1 (not renewed since 2019)	0	0

Many of the above physicians participate in teaching of medical students (usually 3rd and 4th year students in the Island Medical Program) and residents (usually AP/GP/MM residents on elective rotation, as well as occasional Family Medicine residents), annually aggregating to many hundreds of teaching hours. Interdepartmental engagement is robust, with pathologist participation and presentation at regional journal clubs, surgical and medical rounds, and clinicopathologic conferences including BC Cancer tumor boards. Weekly intradepartmental Anatomical Pathology case rounds are also held at the Royal Jubilee Hospital.



**SPOTLIGHT ON UBC CLINICAL
FACULTY IN ISLAND HEALTH - DR.
ANTONIO SUBTIL-DEOLIVEIRA**

Dr. Antonio Subtil-DeOliveira joined the Division of Anatomical Pathology at the Royal Jubilee Hospital in Victoria in 2018. Dr. Subtil-DeOliveira is double trained and board certified in Dermatopathology (Mayo School of Graduate Medical Education)

and Hematopathology (Emory University). In addition to his high volume Anatomical Pathology practice servicing patients of Vancouver Island, particularly those with melanocytic neoplasms, cutaneous lymphomas, and inflammatory dermatoses, he has published 60 peer-reviewed articles, many in high impact journals, which in 2023 was highlighted by a comprehensive analysis of primary cutaneous T-cell lymphomas (Saleh JS, Subtil A, Hristoy AC. Human Pathol 2023;140:75-100). Dr. Subtil contributes significantly to the education of medical students and residents on elective rotation in Victoria. He is a sought-after keynote speaker on regional, national, and international stages, with over 100 invited lectures, most recently at the 43rd Annual Meeting of the Australasian Society of Dermatopathology in Melbourne and the 60th Annual Meeting of the American Society of Dermatopathology in Chicago, both held in the fall of 2023. Stay tuned for his continued global impact in 2024 as Dr. Subtil engages pathology audiences in Vancouver, Halifax, New Zealand, Australia, and his native Brazil.

**HIGHLIGHTS OF ADDITIONAL
RESEARCH ACCOMPLISHMENTS,
EDUCATIONAL ENDEAVORS, AND
CLINICAL IMPACT:**

Dr. Jennifer Duncan (Hematopathology, North Island Hospital - Comox Valley) and **Dr. Gwen Clarke** (Hematopathology, Royal Jubilee Hospital) had two abstracts accepted for work on implementing an immunohematology approach to managing patients treated with Anti-CD38, to be presented at the Canadian Society for Transfu-



sion Medicine (Saskatoon, May 2024) and the International Society for Blood Transfusion (Barcelona, June 2024). During the latter meeting, **Dr. Jennifer Duncan** will also be giving an invited presentation: *“Weathering Stormy Times in the Blood Bank – a Different Perspective on Island Life”*.

Teaching honorable mentions: **Dr. Kirsten Fleming and Dr. Tunde Adegbola** deserve special recognition for outstanding teaching efforts in Center Island, serving as preceptors to learners on elective rotation in Anatomical Pathology at Nanaimo Regional General Hospital. In 2023, a total of 6 medical students in their 4th year of the Island Medical Program each spent 2 weeks on rotation under their supervision, which is highly commendable given the exceptionally busy practice of community pathologists. In Victoria, the Gynecological Pathologist team continued their long-standing weekly 2-hour sessions given to medical students and Family Medicine residents during their rotation block in Obstetrics and Gynecology. In 2024, 5 pathology residents (from UBC, Calgary, and Saskatchewan) will pursue month-long elective rotations on Vancouver Island (1 in North Island – Campbell River Hospital and 4 in South Island – Royal Jubilee Hospital).

As leaders in the field, members of the Division of Medical Microbiology produced Annual Reports in Antimicrobial Stewardship as well as Infection Prevention and Control.

Dr. Davide Salina, among his many responsibilities as Division Lead for Anatomical Pathology, established telepathology services at Island Health sites. Specifically, the utilization of telepathology between Victoria General and Royal Jubilee Hospitals has been a significant milestone in the ability to share digital pathology images during intraoperative frozen section analysis to obtain subspecialty intradepartmental consultation, as well as sustain quality assurance practices (eg. histological confirmation by a second pathologist for all patients with a new/initial diagnosis of malignancy).

Dr. Allison Hall (Anatomical Pathology, RJH) is the Island Health pathology representative to the Provincial HPV Screening Clinical Care Working Group, established May 2023. The group is accountable to the Executive Director of Cancer Screening at BC Cancer, and has a mandate to share information with clinical stakeholders regarding the upcoming changes for cervix screening to HPV primary screening, obtain input from a variety of clinical experts to support the updating of program standards and clinical practice guidelines, and to ensure a fulsome communication plan for physicians in the province who will be interested in and/or affected by this policy change.

Dr. Julie Irving (Anatomical Pathology, RJH) gave a presentation to Island Health pathologists and gynecologists entitled

“A practical overview of ancillary biomarker and molecular testing in endometrial carcinoma” in February 2023. The recent introduction of reflex biomarker and molecular testing performed on tissue from all patients with newly diagnosed endometrial cancers, as recommended by the Provincial Gynecology Tumor Group at BC Cancer, is critical for accurate endometrial tumor classification and appropriate pa-

tient management.

As such, it is imperative that pathologists understand how to interpret and report biomarker studies (immunohistochemistry for p53, DNA mismatch repair proteins, and estrogen receptor), and are familiar with the ordering process for next generation sequencing (including POLE mutation status) currently performed in Vancouver.



Technologist, pathology assistant, and transcription staff, the backbone of Anatomical Pathology at the Royal Jubilee Hospital, showcase their team spirit during the annual Halloween tradition with the 2023 theme “1980s movies”



ASSOCIATE ACADEMIC
DEPARTMENT HEAD FOR THE
INTERIOR HEALTH AUTHORITY

Dr. Denis Bonin

The Interior Health Laboratory Program serves a population of over 800,000 people across a vast geographic area spanning 215,000 square kilometers and two time zones. The program employs 800 laboratory professionals who work in various capacities to ensure quality diagnostic services. There are 53 outpatient collection centers and 22 hospital sites within the Interior Health region, providing accessible and comprehensive laboratory services to meet the healthcare needs of the community. In 2023, the program achieved several significant milestones.



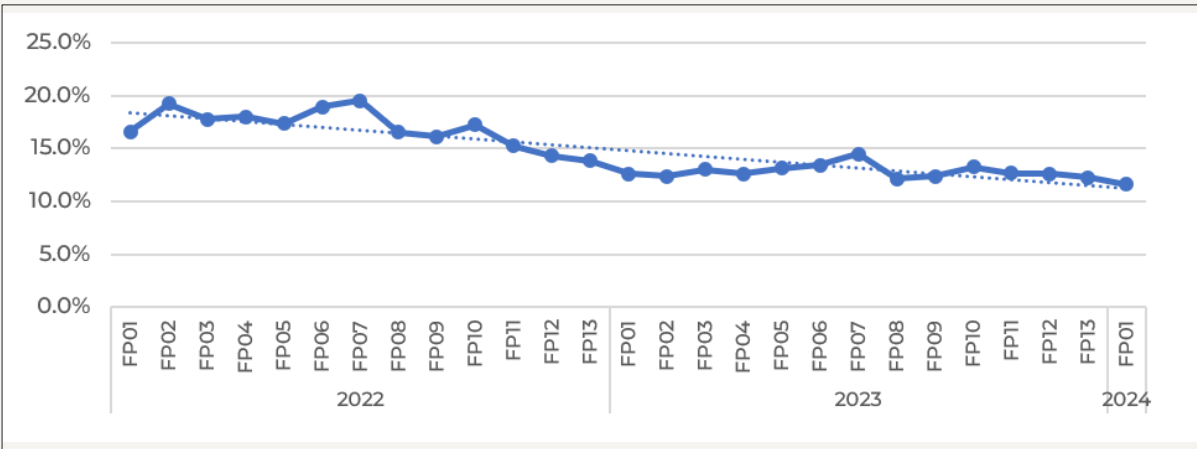
MAJOR INITIATIVES IN 2023

Completed chemistry instrumentation refresh project:

01. In 2023, IH completed a chemistry instrumentation refresh project that began in 2021. **53 new chemistry analyzers** were operationalized across 22 healthcare facilities.

Onboarded 119 new staff members:

02. Despite a high number of retirements, the **IH Laboratory Program reduced its technical staff vacancy rate** by 4.8%; from 17.4% (2022) to 12.6% (2023). In total, 119 new staff members (73 full time and 46 casual) were onboarded in 2023, including 38 MLTs, 76 MLAs and 5 CXLTs.



Royal Inland Hospital in Kamloops became the first fully electronic site in Interior Health:

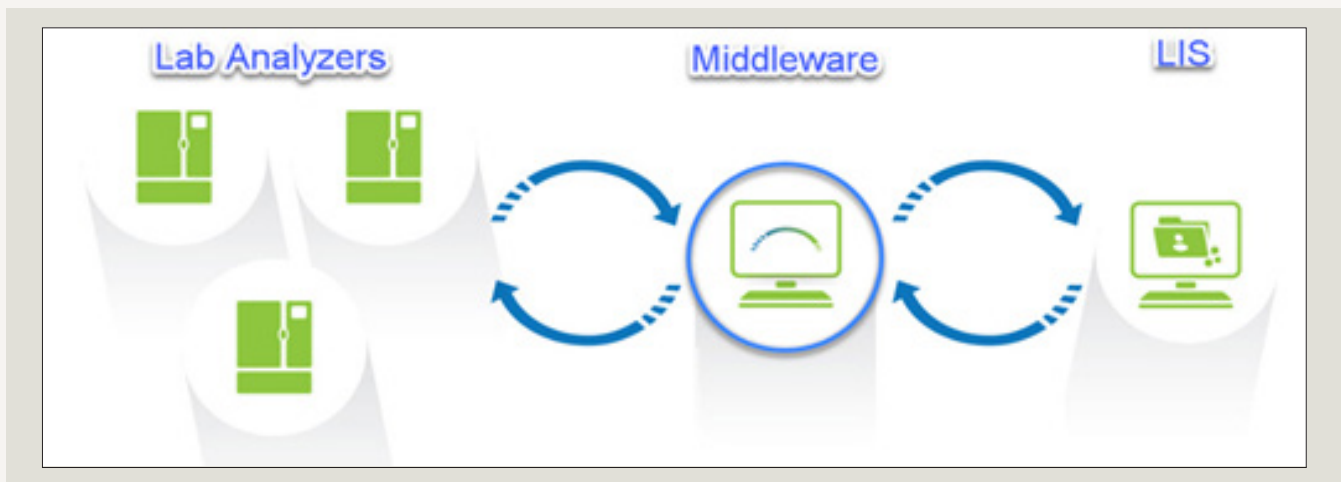
03. Physician order entry and clinical documentation are now fully electronic in all acute care areas at RIH.

Molecular Expansion in Microbiology:

04. Interior Health Medical Microbiology introduced **Group A Streptococcus molecular testing** for inpatient and emergency room throat specimens, resulting in a significant decrease in turn around time facilitating better patient care and promoting antimicrobial stewardship. Additionally, **molecular meningococcal testing** was implemented regionally, decreasing turn around time on this critical test to hours instead of the days required for reference laboratory testing.

Implementation of Middleware Regional Solution:

05. A middleware solution from Data Innovations is being implemented across all IH laboratories. The initial phase of Coagulation Middleware was partially completed in 2023. Plans are underway for implementing Hematology and Chemistry Middleware over the next two years. Once fully implemented, the middleware solution will increase productivity through automation of manual processes, decrease turn around times through autoverification of near normal results and enhance quality by facilitating regional oversight of QC data.



IH Climate and Sustainability Strategy:

06. In an effort to advance the integration of environmental sustainability into clinical operations, a Greening the Labs Opportunity Investigation was launched in June 2023. The project's focus is on reducing our Program's environmental impact in **four main areas: greenhouse gas emissions, energy use, water use, and waste stewardship**. Recommendations from the report are being actioned through a newly formed Laboratory Services Environmental Sustainability Focus Group.

Changes Implemented:

- Closing lab Biosafety cabinet sashes when not in use to reduce energy consumption (equal to three homes of power usage per day)



- Implementing outlet timers to power equipment off when not needed
- Using “sugar sheets” instead of conventional copy paper to lower the lab’s carbon footprint and save trees
- Implementing Choosing Wisely’s recommendations to minimize unnecessary blood work and reduce use of consumables

Physician Engagement:

07. Physicians and their dyad partners are working collaboratively to enhance our laboratory processes. **48% of IH laboratory MDs and PhDs have one or more laboratory leadership roles** including Site Laboratory Medical Directors (12), Site Department Heads (6) and Discipline Leads (9). Two medical microbiologists completed the NAVIG8 Physician Leadership program offered in Interior Health. Many more laboratory professionals are engaged in quality improvement projects and Discipline Working Groups. Our laboratory physicians are also serving as **IH physician leaders** including HAMAC Chair (Lisa Steele), RMAC Chair (Stephanie Nolan), Antimicrobial Stewardship Director (Edith Blondel-Hill) and IPAC Medical Director (Amir Hadzic). In addition, our laboratory professionals participate in provincial and national committees.

Academic Appointments:

08. In 2023, the percentage of laboratory professionals (MDs and PhDs) in IH with academic appointments **increased from 63% to 71%**. There were 8 new UBC appointments from IH: Kyra Berg (KGH), Helen Bibby (KGH), Lisa Borretta (KGH), Launny Lowden (EKRH), Lincoln Pac (EKRH), Laura Tapley (KGH), Valerie Taylor (KGH), Catalin Taraboanta (EKRH).

Academic Promotions:

09. Dr. Karina Rodriguez-Capote was promoted to Clinical Professor. Drs. Teralee Burton and Kristin Hauff were promoted to Clinical Assistant Professor.

Academic Contributions:

10. Our pathologists, medical microbiologists and clinical biochemists continue to be involved in teaching and research. For example, in 2023, Dr. David Gynspan co-authored 3 articles on the topic of placental pathology and participated in the formation of the Placenta Glycomics Research Program, a collaboration between IH Pathology, UBC Okanagan, BC Women’s and Children’s Hospital Department of Pathology, and Carleton University in Ottawa. The program unites UBC-O’s exceptional glycoscience team (Drs. Wes Zandberg and Kirk Bergstrom) with placental pathologists at IH and in Vancouver. The program also brings in the expertise of the Connor Lab at Carleton University (Dr Kristin Connor): a national leader in placentology and maternal nutrition. The program’s aim is to contribute to knowledge about maternal nutrition and metabolic complications of pregnancy such as maternal diabetes.

In another example, the IH clinical biochemists (Drs. Teralee Burton, Karina Rodriguez-Capote, Kristin Hauff and Dailin Li) collectively published 2 articles and an abstract; presented at provincial (BCSLs, BCCDC) and national (CSCC) conferences; provided international webinars (IFCC) served on provincial (DAP, BCACC, MBAC), national (CSCC, CACB) and international (IFCC, ADLM) committees; served as an examiner for the CACB

and on an editorial board (ADLM). Two of our biochemists contributed to the Choosing Wisely Canada's climate-conscious recommendations, Choosing Wisely and Climate Action.

The medical microbiology team published their verification of molecular vaginitis panel testing in 2023 after becoming the first laboratory in Canada to go live with this testing, after which many other groups followed suit. A team member presented the study to a large audience at the 2023 European Clinical Microbiology and Infectious Diseases conference in Copenhagen, Denmark. Multiple Microbiology group members presented at the BCSLS meeting in 2023. In addition to serving on numerous health authority based committees, microbiology group members also served on many provincial and national organizations (eg: UBC residency training committee, Provincial Infection Control Network, Canadian Nosocomial Infection Surveillance Program, BC Provincial Microbiology Advisor Committee, BC Provincial Antimicrobial Clinical Expert group) and one microbiologist served as an examiner for the Royal College Medical Microbiology exam board. Group members had numerous invitations to present grand rounds or at educational events for different physicians groups across the region, as well as to present at the provincial Infectious Diseases rounds.

Upcoming initiatives:

- **Implementation of the Beckman Coulter automation lines at KGH and RIH:** The implementation of the automation lines will increase productivity, increase capacity, reduce turn around times, and improve work safety. The Remisol builds for the Beckman automation lines are scheduled for KGH (summer 2024) and RIH (spring 2025)
- **Meditech Expanse 2.2 will be implemented at all IH sites** (Acute, Community, Primary Care, Mental Health, Long Term Care) in the fall of 2024
- **Expansion of Cellavision:** Cellavision (digital blood smear morphology) was implemented in Kamloops and Kelowna in 2021. Expansion into Vernon, Cranbrook and Trail is expected to be completed in 2024.



Markers to Diagnose Autopsy Confirmed Alzheimer's Disease

Shannon Pflueger², Imogene Scott², Ian Mackenzie^{1,2}, Veronica Hirsch-Reinsdörfer², Dajavad Mowafaghian Centre for Brain Health, Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada, 2 Dajavad Mowafaghian Centre for Brain Health, University of British Columbia, Vancouver, BC, Canada, 3-International Collaboration on Repair Discoveries, Vancouver, BC, Canada

Alzheimer's Disease

Alzheimer's Disease (AD) is the most common form of dementia. The pathology is often mixed.

AD is associated with medications targeting the pathology, but these will target the pathology.

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Study Participants:

Recruited from the UBC Hospital Clinic for Alzheimer's Disease and Related Disorders (CARD) with a clinical diagnosis of dementia.

Post-mortem neuropathological examination features included in this study analysis were: Alzheimer's disease, cerebral amyloid angiopathy, frontal temporal lobe dementia, Lewy body dementia, and tauopathies.

Sample Analysis:

N=96 plasma samples were analyzed on the Quanterix Simoa HD-X analyzer using commercial Neurology 4-plex E and p-tau-181 assays.

Cohort demographics:

Table 1. Demographic information for participants dichotomized by the presence of AD pathology. Further comparison between those with pure AD pathology and those with co-pathology. Comparison analyzed by Mann-Whitney test and Fisher's exact test.

	Full Cohort	Non-AD	AD	p-value	Fisher's	Co-path	p-value
N	96	38	58			22	40
Age (at death)	75 (54-82)	75 (54-82)	75 (54-82)			75 (54-82)	75 (54-82)
Male	51 (53%)	22 (58%)	29 (50%)	0.0002		7 (32%)	22 (55%)
Female	45 (47%)	16 (42%)	29 (50%)	0.0002		15 (68%)	18 (45%)

CARD Clinic Cohort & Sample Analysis

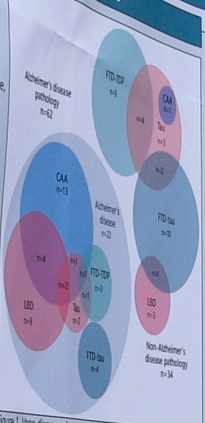


Figure 1. Venn diagram of common neuropathological features of CARD clinic patients. Overlap indicates the presence of co-pathology. Abbreviations: CAA=cerebral amyloid angiopathy, FTD-TDP=frontotemporal dementia, FTD-Tau=frontotemporal dementia, TDP=181 DNA-binding protein 43.

biomarkers be used as a tool to detect autopsy confirmed AD pathology? Impacted by the presence of co-pathology from other dementia subtypes?

Detection of AD Pathology

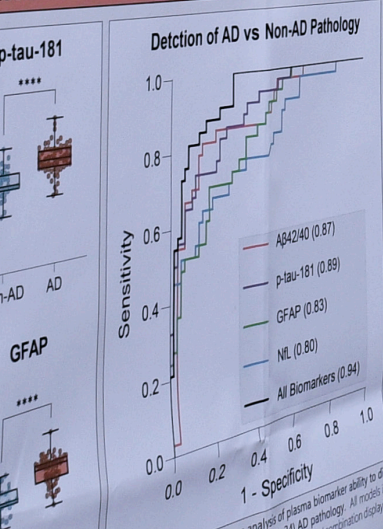


Figure 3. Receiver operating curve analysis of plasma biomarker ability to discriminate those with (N=62) and without (N=34) AD pathology. All models presented in grey box, all ****p < 0.0001.

Influence of Co-Pathology



Figure 4. Concentrations of plasma biomarkers separated by neuropathological findings of non-AD pure AD and AD with non-AD co-pathology. ****p < 0.0001. ****p < 0.0001. ****p < 0.0001. ****p < 0.0001.

low high diagnostic utility for the detection of AD pathology, regardless of the presence of co-pathology. Other biomarkers are needed. This will be an important finding for the development of therapies that may be affected by the presence of co-pathologies.



Pathday June 7, 2024
Jennifer Cooper

03

DEPARTMENT

FACT

SHEET

TRAINING AND ROTATION SUMMARY FOR MEDICAL STUDENTS AND RESIDENTS IN 2023

This section provides a comprehensive summary of the training and rotation activities within the Department of Pathology and Laboratory Medicine at UBC for the year 2023. It includes detailed information on the number of medical students, residents, clinical fellows, and teaching faculty across various hospital sites and specializations.

Total number of medical students trained at each site:

Hematopathology

Site	Students	Preceptors
BCCH	6 students	4 preceptors
VGH	6 students	7 preceptors
SPH	5 students	3 preceptors
RCH	3 students	8 preceptors

Neuro-pathology

Site	Students	Preceptors
VGH	7 students	5 preceptors

Microbiology

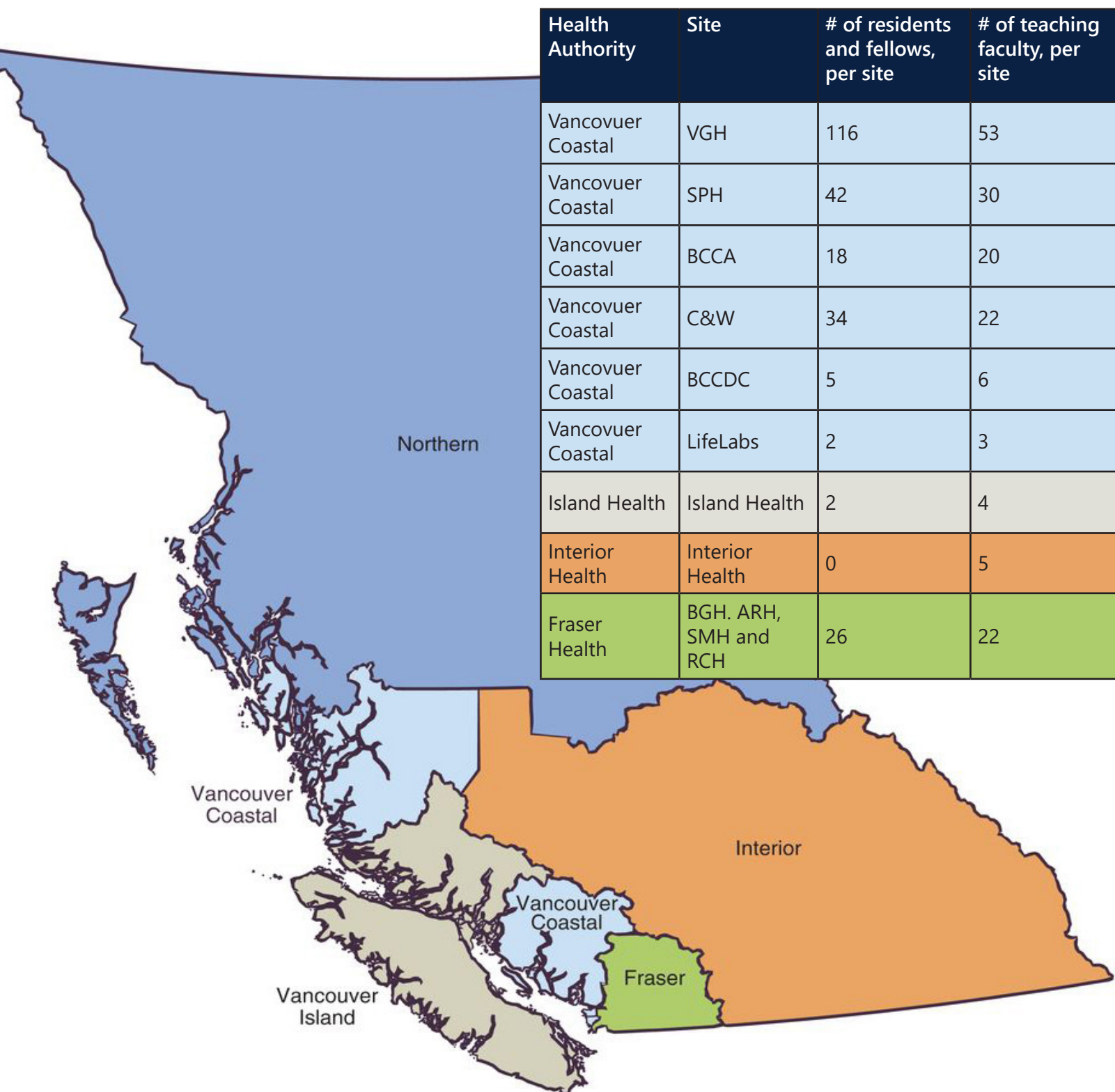
Site	Students	Preceptors
BCCH	2 students	4 preceptors
VGH	2 students	3 preceptors
SPH	9 students	4 preceptors
BCCDC	1 students	6 preceptors

DMP

Site	Students	Preceptors
BCCH	2 students	8 preceptors
VGH	21 students	20 preceptors
SPH	5 students	7 preceptors

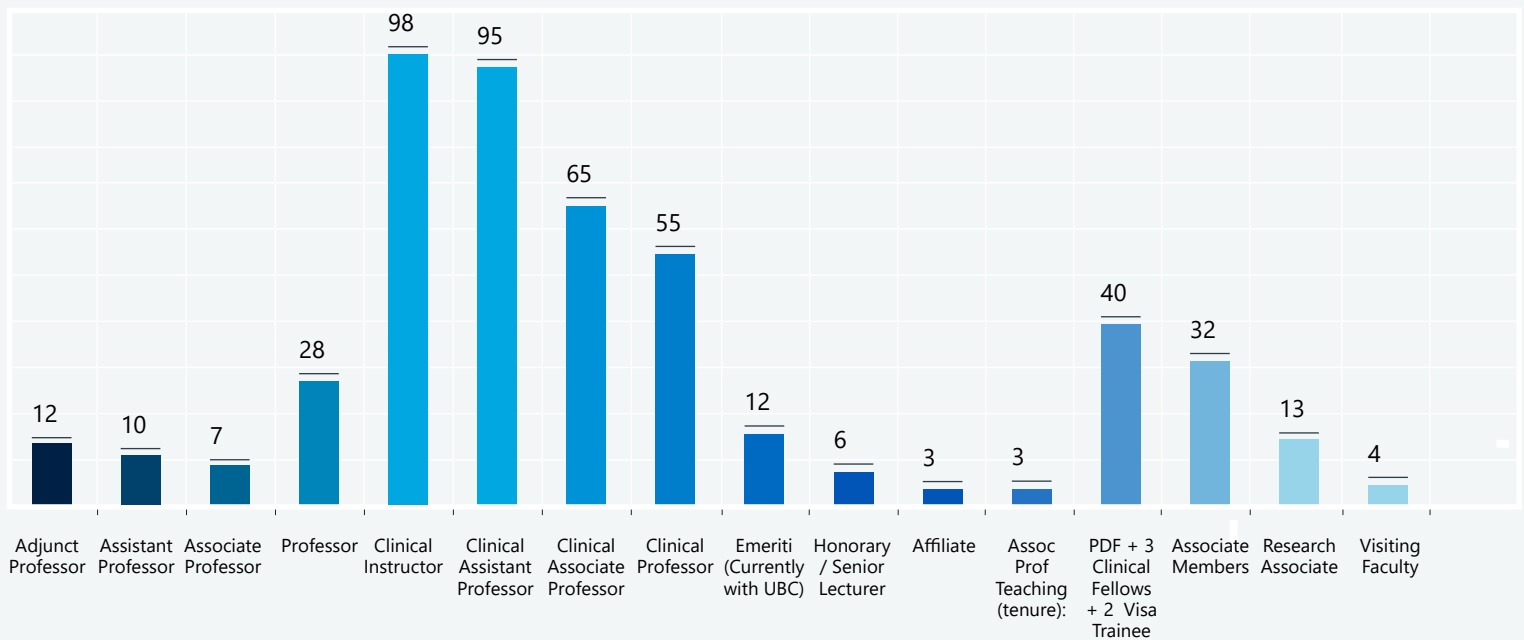
Number of Residents and Fellows Trained or Rotated by Site in 2023.

For a detailed view, please refer to the [full PDF report](#).



FACULTY BY RANK

TOTAL: 451 (+ 32 ASSOCIATE MEMBERS AND 4 VISITING)

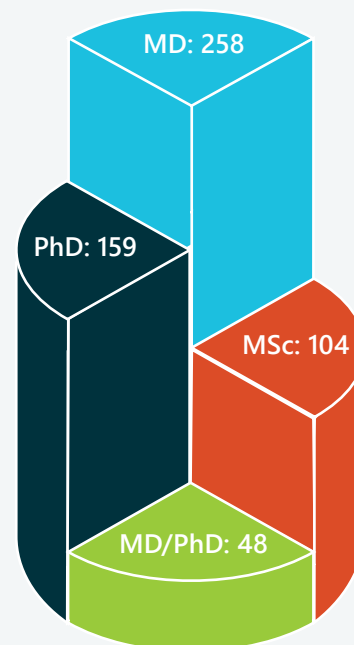


FACULTY BY DEGREE

EXCLUDING: PDF, RESEARCH ASSOCIATE, ASSOCIATE MEMBERS & VISITING MEMBERS

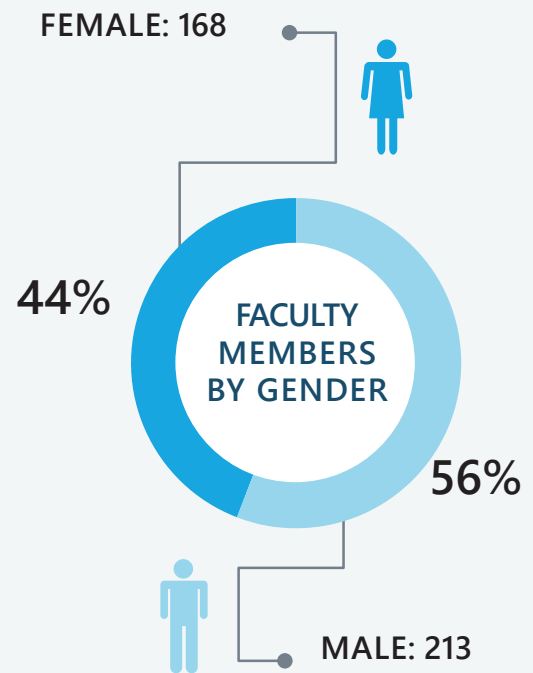
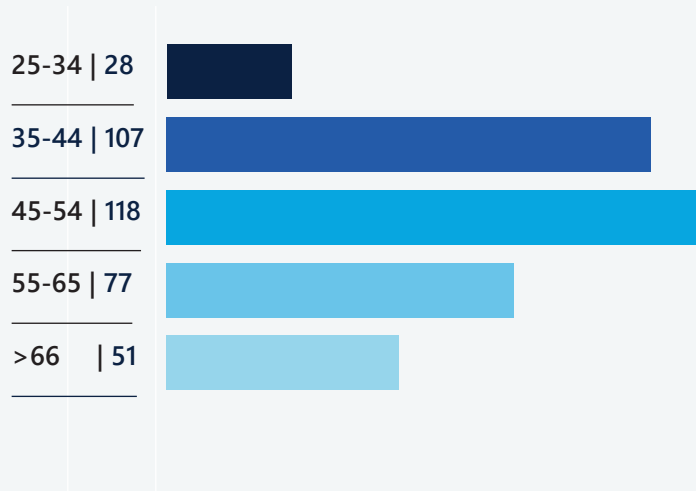
- **258 (68%)**
Doctor of Medicine (MD)
- **159 (42%)**
Doctor of Philosophy (PhD)
- **104 (28%)**
Master of Science (MSc)
- **48 (13)** Doctor of Medicine (MD) / Doctor of Philosophy (PhD)

11 (3%) Faculty Members with MD, MSc & PhD



FACULTY BY AGE GROUP

EXCLUDING ASSOCIATE MEMBERS,
PDF, RESEARCH ASSOCIATES AND EMERITUS



EMPLOYEE GROUPS

STAFF APPOINTMENTS

- 11 Secretarial/Clerical (CUPE 2950)
- 33 M&P – AAPS
- 54 Non Union Technicians and RA
- 79 Student Services Appointees

FACULTY APPOINTMENTS

- 48 Academic Faculty
- 313 Clinical Faculty
- 12 Emeriti (Currently with UBC)
- 25 Affiliate, Honorary, Adjunct & Visitors
- 53 PDF, Clin. Fellows & Research Associates

NEW APPOINTMENTS, RETIREMENTS, AND PROMOTIONS IN 2023

NEW CLINICAL FACULTY MEMBERS IN 2023

We are pleased to welcome the following new clinical faculty members who have joined the Department of Pathology and Laboratory Medicine in 2023. Their expertise and dedication will significantly contribute to our mission of excellence in education, research, and clinical service.

PROVINCIAL HEALTH SERVICES AUTHORITY

BC Cancer

- **Priya Johal** - Clinical Instructor
- **Jinesa Moodley** - Clinical Instructor

BC Children's and Women's

- **Laura Brett** - Clinical Instructor
- **Sam Chorlton** - Clinical Instructor
- **Jonathan Gubbay** - Clinical Associate Professor
- **Marsha Speevak** - Clinical Instructor
- **Stacey Hume** - Clinical Associate Professor

BC Centre for Disease Control

- **Sandrine Merette** - Clinical Assistant Professor

VANCOUVER COASTAL HEALTH

St. Paul's Hospital

- **Michael Payne** - Clinical Associate Professor

Vancouver General Hospital

- **Sidney Austin** - Clinical Instructor
- **Corrie Belanger** - Clinical Instructor
- **Heather Glassman** - Clinical Assistant Professor
- **Zeid Hamadeh** - Clinical Instructor
- **Julia Naso** - Clinical Assistant Professor
- **Dan Li** - Clinical Assistant Professor
- **Diandra Mark** - Clinical Instructor
- **Carl Ren** - Clinical Instructor
- **Karen Sherwood** - Clinical Assistant Professor
- **Billie Velapatino** - Clinical Instructor
- **Meng Wang** - Clinical Instructor

NORTHERN HEALTH

Mills Memorial

- **Bridget Fergie** - Clinical Instructor

FRASER HEALTH

Royal Columbian Hospital

- **Edwin Ho** - Clinical Instructor
- **Ariel Liu** - Clinical Instructor
- **Ashley Newbigging** - Clinical Instructor

Surrey Memorial Hospital

- **Wenqian Chen** - Clinical Instructor
- **Nissreen Mohammad** - Clinical Instructor
- **Sarisha Naidoo** - Clinical Assistant Professor

Burnaby Hospital

- **Lucy Bradley** - Clinical Instructor

INTERIOR HEALTH

East Kootenay Regional Hospital

- **Launny Lowden** - Clinical Instructor
- **Lincoln Pac** - Clinical Instructor
- **Catalin Taraboanta** - Clinical Assistant Professor

Kelowna General Hospital

- **Helen Bibby** - Clinical Instructor
- **Valerie Taylor** - Clinical Instructor
- **Kyra Berg** - Clinical Instructor
- **Lisa Borretta** - Clinical Instructor
- **Laura Tapley** - Clinical Instructor

ISLAND HEALTH

Royal Jubilee Hospital

- **Jenny Chu** - Clinical Instructor

Victoria General Hospital

- **Ramesh Saeedi** - Clinical Assistant Professor



NEW ACADEMIC FACULTY MEMBERS

- **Dr. Martial Guillaud**, Assistant Professor (Partner)
- **Dr. Thomas Sierocinski**, Adjunct Professor
- **Dr. Katey Enfield**, Assistant Professor

FACULTY PROMOTIONS

Promotion to Clinical Professor

- Dr. Christine Tyson
- Dr. Wei Xiong
- Dr. Hui-Min Yang
- Dr. Mari DeMarco
- Dr. Karina Rodriguez-Capote
- Dr. Pedro Sequeira Farinha

Promotion to Clinical Associate Professor

- Dr. Maziar Riazzy
- Dr. Audi Setiadi
- Dr. Nancy Matic
- Dr. Lisa Li
- Dr. Majid Moteabbed
- Dr. Lik Hang Lee

Promotion to Clinical Assistant Professor

- Dr. Claudine Desruisseaux
- Dr. Carlos Villamil
- Dr. Daniel Owen
- Dr. Kristin Hauff
- Dr. Teralee Burton
- Dr. Youness Elkhaldy

Promotion to Professor

- Dr. Kevin Bennewith

Promotion to Associate Professor

- Dr. Philipp Lange

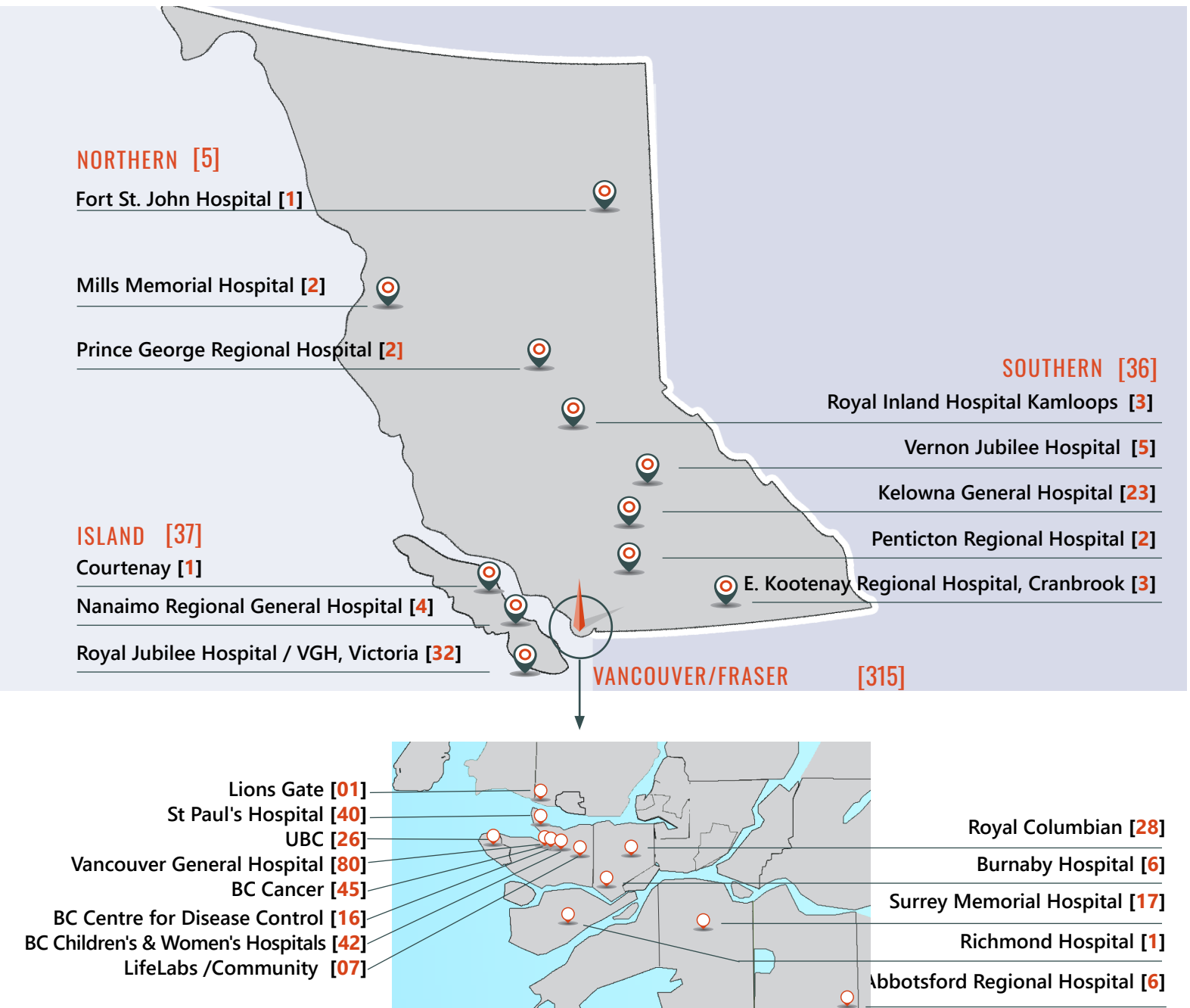
RETIRED FACULTY MEMBERS

We extend our heartfelt gratitude and best wishes to the following retired faculty members for their years of dedicated service and contributions to the department.

- **John Galbraith** - Clinical Associate Professor
- **Cheryl Wright** - Clinical Instructor
- **Dr. Dana Devine** - Professor Emerita
- **Dr. Victor Ling** - Professor Emeritus
- **Dr. Avi Ostry** - Clinical Associate Professor (deceased)

FACULTY BY MEDICAL PROGRAMS & SITE

TOTAL: 393 (EXCLUDING ASSOCIATE MEMBERS, RA AND PDF)



AFFILIATED CLINICAL ACADEMIC FACILITIES

2023/24

01

CLINICAL ACADEMIC CAMPUSES

BC Cancer

BC Children's Hospital

BC Women's Hospital & Health Centre

Kelowna General Hospital

Royal Columbian Hospital

Royal Jubilee Hospital

St. Paul's Hospital

Surrey Memorial Hospital

University Hospital of Northern B. C.

Vancouver General Hospital

UBC Hospital

Victoria General Hospital

02

UBC AFFILIATED RESEARCH CENTRES

Centre for Blood Research

Centre for Heart Lung Innovation

Djavad Mowafaghian Ctr for Brain Health

ICORD

BC Centre for Disease Control

Vancouver Prostate Centre

03

AFFILIATED REGIONAL CENTRES

Abbotsford Regional Hospital

Burnaby Hospital

Lions Gate Hospital

Fort St. John Hospital

Vernon General Hospital

Penticton General Hospital

Nanaimo Regional Hospital

Richmond Hospital

Terrace Mills Memorial Hospital

Vernon Jubilee Hospital

Royal Inland Hospital, Kamloops

04

UBC AFFILIATED RESEARCH INSTITUTES

BC Cancer Research Institute

BC Children's Hospital Research Institute

Life Sciences Institute

Providence Health Care Research Institute

Vancouver Coastal Health Research Institute

Women's Health Research Institute

EDUCATION PROGRAMS

Our academic programs continue to foster excellence in education and research, producing highly skilled professionals equipped to contribute significantly to their fields. The following statistics highlight the achievements and scope of our various programs:

BMLSc PROGRAM

Number of Students	29
Program Courses (PATH:15; non PATH: 3)	18
Program Credits	61
Instructors (Faculty, Technologists, Others)	96
Lecture Hours	720
Other Types of Instruction - Hours	537

GRADUATE STUDIES

Program of Study	Students
MSc	28
PhD	34
MD/PhD Program	1
Total	63
# of Supervisors	34

UNDERGRADUATE COURSES

Course	#Credits	#Students
ATH 375.001	3	42
PATH 375.002	3	76
PATH 417	3	27
PATH 437	3	1
PATH 438	3	5
Total	15	151

BMLSc MAJOR AWARDS 2023:

- BMLSc Graduates' Choice for Teaching Excellence Award:*
Dr. Sophia Park,
Dr. James Lan and
Dr. Narges Hadjesfandiari
- The Reid Memorial Cup:*
Dr. Narges Hadjesfandiari

GRADUATE STUDIES MAJOR AWARDS 2023:

- Vanier Canada Graduate Scholarship:*
Vriti Bhagat
- Canada Graduate Scholarships — Doctoral (CGS D):*
Loulou Cai
Jennifer Cooper
Fang Fang Li
Joyce Zhang
- Canada Graduate Scholarships — Master's (CGS M):*
Maria Elishaev
Rebecca Ho
Michael Lane
Eric Liu
- Four Year Doctoral Fellowship (4YF):*
Guadalein Tanunliong
Maria Elishaev

INFECTION PREVENTION AND CONTROL (IPC) CERTIFICATE

Course	#Credits	#Students
PATH 427	3	0
PATH 451	3	8
PATH 467	3	4
PATH 477	3	9
Total	9	21

RESIDENCY PROGRAM

Program of Study	Residents
Anatomical Pathology	23
General Pathology	0
Neuropathology	1
Hematopathology	4
Medical Microbiology	8
Medical Biochemistry	0
AFC-Transfusion Medicine	1
AFC-Pediatric & Perinatal Pathology	1

RESIDENCY MAJOR AWARDS 2023:

- *Melvyn Bernstein Award:*
Dr. Richard Crawford
- *Roberta Millar Award:*
Dr. Nancy Matic (Medmicro),
Dr. Peter Schutz (NeuroPath),
Dr. Krista Marcon (HemePath)

FELLOWSHIPS

Program of Study	Residents
Gynecological Pathology	1
Head & Neck Pathology	1
Bone & Soft Tissue Pathology	1
Gastrointestinal & Liver Pathology	1
Dermatopathology	1
Breast Pathology	1
Infection Prevention & Control (IPAC)	1
AFC-Pediatric & Perinatal Pathology	1
Antimicrobial Stewardship	1

390 students & trainees

This includes: 63 in Graduate Studies;
29 in BMLSc; 21 in IPC Certificates;
151 in Undergraduate Courses; 39 in
Residency Programs and 9 in
Fellowships

PATHOLOGY MEDICAL UNDERGRADUATE PROGRAMS

Specialty	# of students	#of weeks	VFMP Hospital
DMP - Diagnostic & Molecular Pathology	22	52	VGH, SPH, CWH
FP - Forensic Pathology	18	42	ARH, BH
HP -Hematopathology	15	24	CWH, VGH, RCH
MM - Medical Microbiology	15	29	SPH, VGH, CWH
LCG - Lab Cancer Genetics	2	4	VGH
NP - Neuropathology	7	18	VGH

CPC sessions (year 1 &2)
of Faculty Participating: 28
Instructional hours: 56

Fourth Year Electives
of Faculty Participating: 84
of sessions: 1126

RESEARCH METRICS OF OUR FACULTY 2023

This section highlights the significant research contributions of our faculty members, showcasing their impact through metrics such as citations, h-index, and i10-index, sourced from Google Scholar. Presented here are the top 10 faculty members from both our academic and clinical department members.

Academic

David Huntsman #1

Citations: 105,369 (All), 60,435 (Since 2019)
h-index: 158 (All), 102 (Since 2019)
i10-index: 464 (All), 410 (Since 2019)

Ian Mackenzie #4

Citations: 62,794 (All), 24,999 (Since 2019)
h-index: 106 (All), 67 (Since 2019)
i10-index: 244 (All), 198 (Since 2019)

Poul Sorensen #7

Citations: 28,036 (All), 11,826 (Since 2019)
h-index: 88 (All), 56 (Since 2019)
i10-index: 194 (All), 155 (Since 2019)

Cheryl Wellington #10

Citations: 19,842 (All), 6,972 (Since 2019)
h-index: 70 (All), 45 (Since 2019)
i10-index: 141 (All), 114 (Since 2019)

Samuel Aparicio #2

Citations: 78,731 (All), 37,862 (Since 2019)
h-index: 112 (All), 82 (Since 2019)
i10-index: 229 (All), 192 (Since 2019)

Andrew Churg #5

Citations: 36,659 (All), 8,960 (Since 2019)
h-index: 105 (All), 50 (Since 2019)
i10-index: 397 (All), 189 (Since 2019)

Christian Steidl #8

Citations: 23,253 (All), 11,818 (Since 2019)
h-index: 74 (All), 63 (Since 2019)
i10-index: 159 (All), 141 (Since 2019)

Torsten Nielsen #3

Citations: 62,544 (All), 25,908 (Since 2019)
h-index: 106 (All), 72 (Since 2019)
i10-index: 239 (All), 191 (Since 2019)

Wan L. Lam #6

Citations: 29,402 (All), 9,602 (Since 2019)
h-index: 87 (All), 51 (Since 2019)
i10-index: 259 (All), 171 (Since 2019)

Aly Karsan #9

Citations: 21,998 (All), 8,381 (Since 2019)
h-index: 69 (All), 38 (Since 2019)
i10-index: 174 (All), 119 (Since 2019)

Clinical

Linda Hoang #1

Citations: 6,271
h-index: 43
i10-index: 123

Andre Mattman #4

Citations: 4,209
h-index: 32
i10-index: 60

Marc Romney #7

Citations: 2446
h-index: 29
i10-index: 52

Gordon Ritchie #10

Citations: 1611
h-index: 21
i10-index: 32

Muhammad Morshed #2

Citations: 6,671
h-index: 39
i10-index: 103

Ed Pryzdial #5

Citations: 3,080
h-index: 30
i10-index: 50

Mari DeMarco #8

Citations: 3,076
h-index: 27
i10-index: 43

Daniel Holmes #3

Citations: 3,180
h-index: 33
i10-index: 76

David Goldfarb #6

Citations: 3830
h-index: 29
i10-index: 62

Richard Crawford #9

Citations: 1,635
h-index: 23
i10-index: 45



+\$41,231,444 **PI grants**

In 2023, our Principal Investigators received over \$41,231,444 in grant funding. This substantial support underscores the impactful and diverse research conducted by our faculty, furthering advancements in various scientific fields.



+620 **refereed publications**

In 2023, our faculty published over 610 refereed publications. This high number shows the wide range of our research and our dedication to advancing science and making important contributions in many areas.

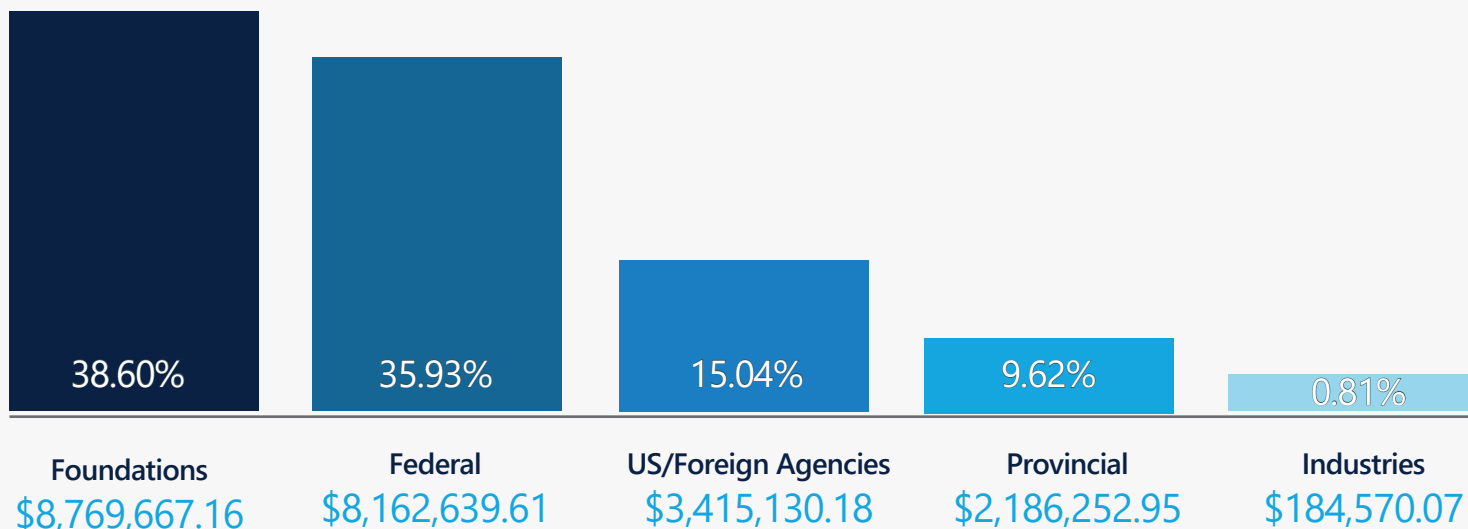
RESEARCH FUNDS



RESEARCH GRANT FUNDING SOURCES

\$22,718,259,⁹⁷

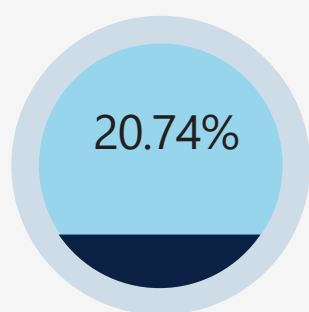
total



PERSONNEL AWARDS

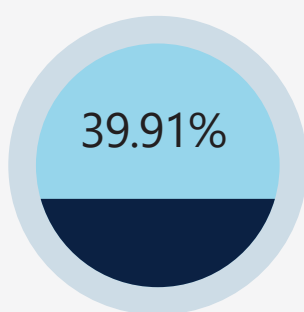
\$3,001,386⁸⁵

total



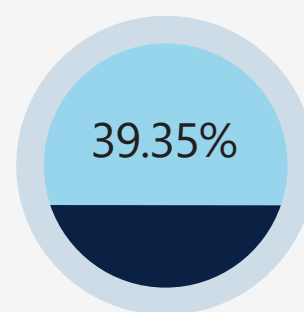
Investigatorships
\$622,500.00

(Salary awards from Chairs i.e CRC)



Postdoctoral Fellowships
\$1,197,719.85

(Salary awards for Postdoc Fellows from various granting agencies)



Chairs
\$1,181,167.00

(Salary awards for Faculty Members from various granting agencies)

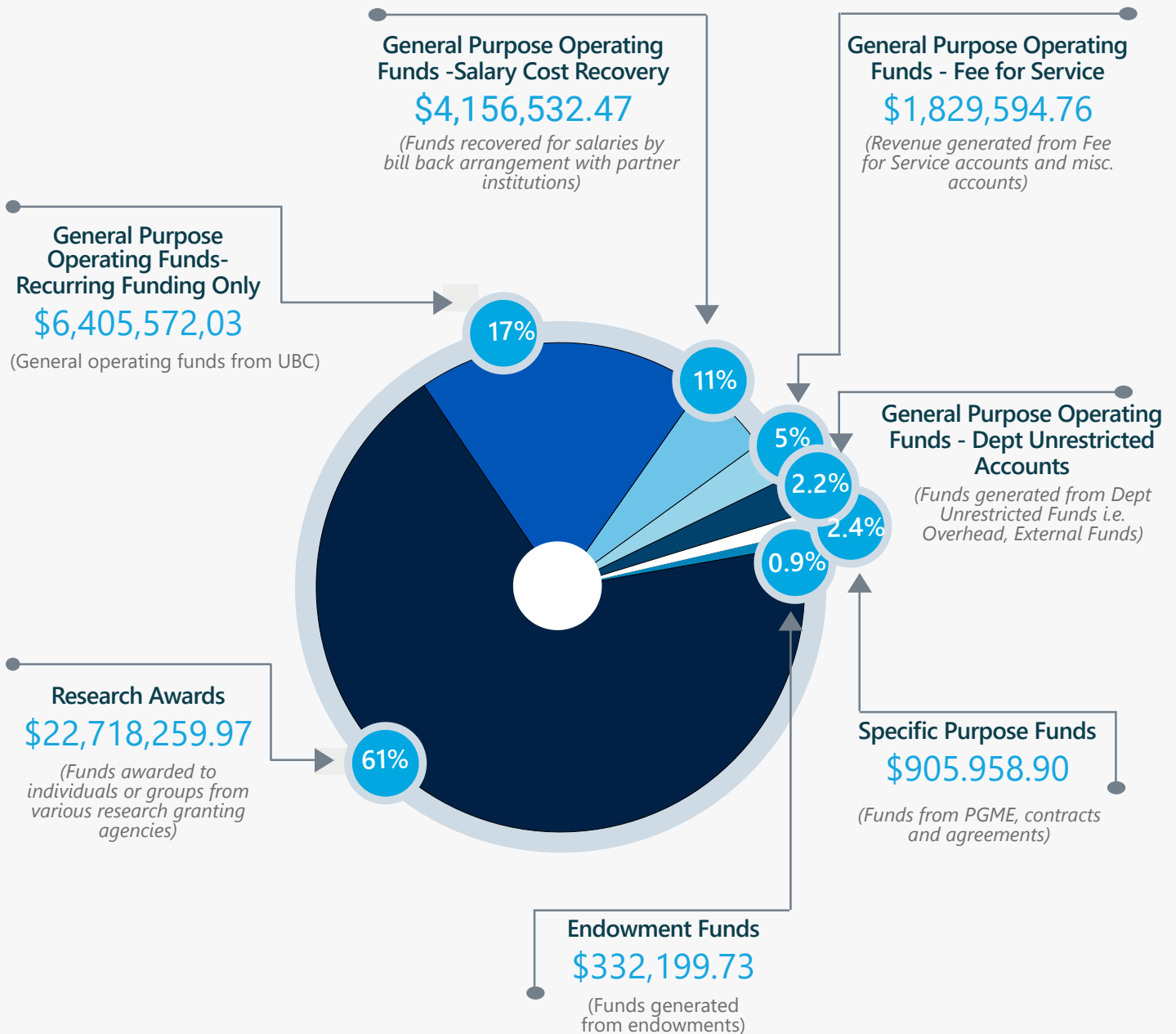
REVENUE & BUDGET



RESEARCH GRANT FUNDING SOURCES

\$37,183,078

total



AWARD RECIPIENTS 2023

EXTERNAL AWARDS 2023



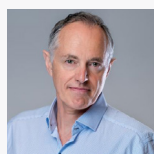
SAM APARICIO, Professor
*Cancer Society's Robert L. Noble Prize
Renewal of the Tier 1 Canada Research
Chair in Blood Cancers*



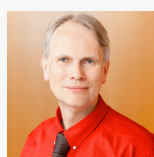
PETER WATSON, Professor
*International Society for Biological and
Environmental Repositories (ISBER),
Outstanding Achievement in Biobanking
Award 2023*



DAVID HUNTSMAN, Professor
*Memorial University, Doctorate of
Science honoris causa for being global
leader within the Canadian cancer
research community*
*Recognized with Medicine Leader Award
for 2023 ranked #911 in the world
ranking and #29 in Canada*
*Renewal of the Tier 1 Canada Research Chair
Chair in Molecular and Genomic Pathology*



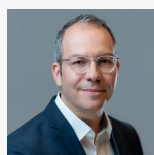
POUL SORENSEN, Professor
*Honored as an ambassador of the Technical
University of Munich*



TORSTEN NIELSEN, Professor
*Elected as a Fellow of the Canadian Academy
of Health Sciences, 2023*



YONGJIN PARK, Assistant Professor
*Named Canada Research Chair in Integra-
tive Causality Inference of Cancer Mecha-
nisms (Tier 2)*



DAVID SCHAEFFER, Associate Professor
*Appointed as the inaugural Pancreatic Cancer
Research Chair at Vancouver General Hospital
(VGH)*

UBC & FACULTY OF MEDICINE AWARDS 2023



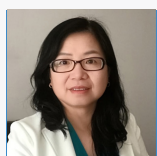
DAVID HUNTSMAN, Professor
*10th annual Dr. Chew Wei Memorial Prize in
Cancer Research, UBC*
*Excellence in Clinical or Applied Research,
Faculty of Medicine Distinguished
Achievement Award*



AMANDA BRADLEY, Associate Professor of
Teaching
*Excellence in Education, Faculty of Medicine
Distinguished Achievement Award*



ALY KARSAN Professor
*Excellence in Clinical or Applied Research,
Faculty of Medicine Distinguished
Achievement Award*

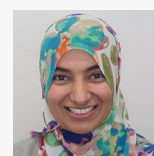


HONGLIN LUO, Professor
*Excellence in Basic Science Research, Faculty
of Medicine Distinguished Achievement
Award*

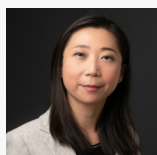
DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE AWARDS 2023



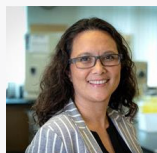
MUHAMMAD MORSHED, Clinical Professor
*Education: Undergraduate Education and
Graduate Education (VGH) Award*



GHADA AL-RAWAHI, Honorary Adjunct
Professor
*Education: Resident and Fellow Education
Award*



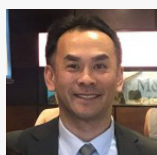
YING WANG, Assistant Professor
Research And Discovery: Faculty researchers
who are within 7 years of their faculty
appointment



LINDA HOANG, Clinical Professor
Clinical Service: Clinical Service in Academic
Settings/University Hospitals



MEL KRAIDEN, Professor
*David Hardwick Lifetime Achievement Award
(Golden Bow Tie Award)*



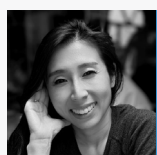
WILLSON JANG, Team Lead - Microbiology
& Virology Laboratory, Providence Health Care
*Staff Service Award: Technicians and
technologists*



HONOR CHEUNG
Trainee Award: MSc Student



SUEFAY LIU
*Trainee Award: Post-Doctoral Fellow, Fellow,
or Resident*



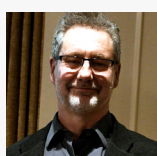
SOPHIA PARK, Clinical Associate Professor
*BMLSc Students Award: Teaching Excellence
Award*



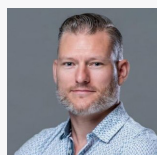
WENPENG (WILLIAM) WANG
*Philip E. Reid Memorial CUP Award for
Outstanding Contribution to the BMLSc
Program*



PETER SCHUTZ, Clinical Associate Professor
*Dr. Melvyn Bernstein Resident Teaching Award
(for non-AP staff) - NP*



RICHARD CRAWFORD, Clinical Professor
*Dr. Roberta Miller Resident Teaching Award
(for AP Staff)*



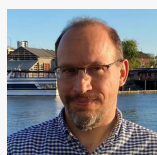
WILL LOCKWOOD, Associate Professor
Research And Discovery: All other Faculty



DAVID GRANVILLE, Professor
Most Valuable Player (MVP) Award



HELEENA MISTRY, Assistant to
Department Head
Staff Service Award: Administrative Staff



ANDRE MATTMAN, Clinical Professor
*Community Engagement and Philanthropy
Award*



AMIRHOSSEIN BAHREYNI
Trainee Award: PhD Student or Candidate



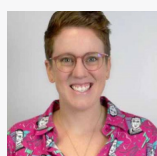
JAMES LAN, Assistant Professor
*BMLSc Students Award: Teaching Excellence
Award*



JENNIFER XENAKIS, Educational Services
Manager BMLSc
*BMLSc Students Award: Teaching Excellence
Award*



NANCY MATIC, Clinical Associate Professor
*Dr. Melvyn Bernstein Resident Teaching Award
(for non-AP staff) - MM*



KRISTA MARCON, Clinical Assistant
Professor
*Dr. Melvyn Bernstein Resident Teaching Award
(for non-AP staff) - HP*



04

HIGHLIGHTED
RESEARCH
AND TRAINING
SUBMISSIONS



Dr. Linda Hoang,
Affiliated Teaching Hospital Head,
BC Centre for Disease Control

RESEARCH AND TRAINING OVERVIEW AT THE UBC CDC

In 2023, the UBC CDC Faculty of Pathology and Laboratory Medicine led 12 major research projects as Principal Investigators or Co-Principal Investigators, with a combined funding of over \$11M. These projects cover diverse areas such as respiratory viruses, pathogen control, tuberculosis, COVID-19, and antimicrobial resistance. Additionally, we trained 38 students and residents. This included 5 summer undergraduate students, 27 residents, and 6 graduate students.

Trainees at UBC CDC (2023):

- **Total Trainees:** 38
- **Undergraduate Students:** 5 summer students
- **Residents:** 27 (from various disciplines)
- **Graduate Students:** 6 trained by UBC CDC Pathology and Laboratory Medicine Faculty
- **PHL Fellows:** The BCCDC Public Health Laboratory hosted medical microbiology, dermatology, and infectious diseases fellows (exact number not specified)

Curriculum Changes in 2023

- **General Role:** UBC CDC is primarily a research center and not involved in teaching or curriculum delivery.
- **New Addition:** The BCCDC PHL rotation for Medical Microbiology residents now includes a Pathogen Genomics rotation as an optional area of focus

Faculty and Staff Involvement in Teaching

- **Total Faculty Involved:** 15 Pathology faculty members
- **New Faculty Members:** Titus Wong, Jennifer Grant, Adriana Airo, Sandrine Merette
- **Retirement:** Paul Levett
- **Acknowledgment:** Recognition of the BCCDC PHL technical staff for their dedication and support in teaching and training medical residents and students

Challenges in Delivering Educational

1. SPACE

- **Issue:** Insufficient space for wet lab work and desk space due to an increased number of faculty and research grants
- **Mitigation:** Implemented hybrid work schedules for some staff
- **Impact:** Space limitation prevents further expansion of research programs, including taking on more graduate students

2. RESEARCH BANDWIDTH

- **Issue:** High clinical workload from the COVID-19 pandemic continues to impact research productivity

Student Feedback on Training Experience

- **Seminars and Networking:** Students express interest in BCCDC Work in Progress seminars and enjoyed networking events hosted by the student engagement committee
- **Breadth of Exposure:** Students commend the unique learning experience at BCCDC, highlighting the skilled expertise and specialized microbiology exposure available only at this reference laboratory setting
- **Unique Training Site:** BCCDC PHL is the only site providing training and exposure to public health and reference laboratory clinical practice, with opportunities to participate in related research and innovations
- **Challenges:** Students noted insufficient faculty contact time, crucial for unique training exposure at this site
- **Appreciation:** Trainees greatly appreciate the wet-lab mycology and parasitology didactic sessions provided by BCCDC PHL technologists as part of Path 722

Planned Developments for Student Training Programs (Next Academic Year)

- **Status:** No new developments or expansions planned

Notable Successes (2023)

- **PhD Defenses:** 2 PhD students successfully defended their theses
- **New PhDs:** Dr. Aidan Nikiforuk and Dr. Kevin Kuchinski

Research Activities Overview

Active Research Projects

- **SAFEGUARD:** Surveillance Alert for Fast Epidemiology Genomics and Unified Agile

Response to Disease against respiratory viruses using wastewater surveillance. (Genome Canada/Genome BC; \$3M)

- **UPCOAST-N:** Unified Pathogen Control OneHealth Approach Specifically Targeting Norovirus. (Genome BC; \$499k)
- **UPCOAST-V:** Unified Pathogen Control OneHealth Approach Specifically Targeting Vibrio. (Genome BC; \$498k)
- **PeptAID:** Antimicrobial peptides to replace antibiotics in farm veterinary practice. (Genome Canada; \$159k subaward)
- **PILOT TB:** Phylogenetic improvements using long-read Sequencing for understanding Transmission of m. tuberculosis. (BC Lung Association; \$50k)
- **Early Childhood Viral Infections:** Exploring the role of early childhood viral infection on the development of sleep disordered breathing and asthma. (CIHR; \$344k subaward)
- **BOLSTER-3:** Pathogen Research for establishing infrastructure to support threat response. (CFI; \$4.1M)
- **COVID-19 Infrastructure Project:** Linking Transmission Metadata to Viral Genotype and Serological Response. (CFI; \$653k)
- **PREVENT-COVID Study:** Prospective Evaluation of Immunity after COVID-19 vaccines. (PHAC; \$1.9M)
- **Healthcare Infection Metrics:** Establishing quality metrics for healthcare associated infection analysis. (UBC FoM; \$10k)
- **Lyme Disease Diagnosis Optimization:** (CIHR; \$200k)
- **MERMAID:** Metabolomics for Infectious Diseases. (Health Research BC; \$450k)

Subset of Notable active research projects in 2023 with UBC CDC Faculty of Pathology and Lab Medicine as co-investigators

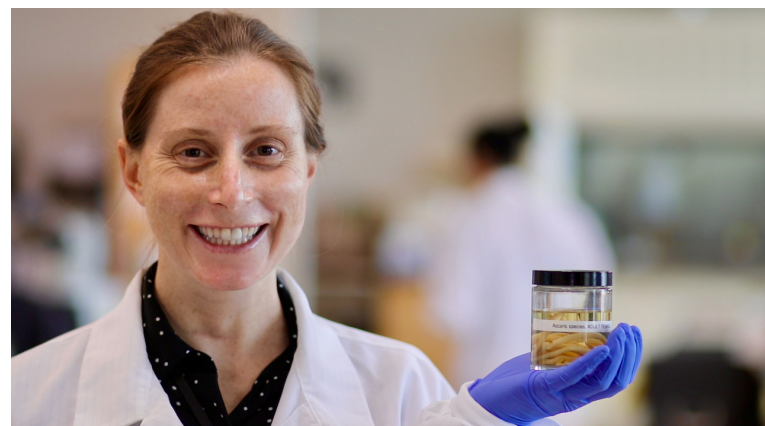
- **CAMP:** Mpox Canada Africa Mpox Partnership aimed at understanding the transmission and disease burden of this emerging pathogen (CIHR; \$2M)

- **Mpox Surveillance:** Optimizing Mpox surveillance strategies and preventing epidemic resurgence: a three-province mathematical modeling study (CIHR; \$500k)
- **COVID-19 Antenatal Serosurveillance:** (PHAC)
- **SHSN:** Sentinel Household Surveillance Network for household respiratory viruses serosurveillance (PHAC)
- **Biomass Smoke Exposure:** Biomass smoke exposure and COVID-19 interdisciplinary project (BC Lung Association; \$50k)
- **Community-Based Testing:** Drawing on COVID-19 testing innovations to inform scale-up of community-based testing for communicable diseases in BC (Health Canada; \$1.2M)

Student Involvement in Research

- **Guadalein Tanunliong (PhD Student):** Evaluating immune responses to different Coronaviruses and associated clinical outcomes in antenatal women
- **Brynn McMillan (PhD Student):** Evaluating immune responses to COVID-19 vaccines in community-dwelling elderly

- **Fang Fang Li (PhD Student):** Linking early-life viral exposures to outcomes, and investigating the use of serological testing in neurological disorders
- **Arnold Okpani (PhD Student):** Occupational health during the COVID pandemic.
- **Avani Bhangav (Co-op Student from UVic):** Establishing quality metrics for healthcare-associated infection analysis
- **Liam Bryne (Graduate Student):** Characterizing antimicrobial resistance in wastewater
- **Angel Yao (Undergraduate Student):** Investigating comprehensive testing approaches for tick identification
- **Kevin Kuchinski (Completed PhD in 2023):** Sequencing avian influenza genomes in mud from wild bird habitats to prevent outbreaks and prepare for pandemics
- **Aidan Nikiforuk (Completed PhD in 2023):** Understanding the role of ACE-II in SARS-CoV-2 transmission
- **Darcy Sutherland (PhD Student):** Unlocking antimicrobial peptides as novel therapeutics against multi-drug resistant bacteria





Dr. Gang Wang,
Affiliated Teaching Hospital Head,
BC Cancer

RESEARCH AND TRAINING OVERVIEW AT THE BC CANCER

In 2023, BC Cancer Pathology trained 53 trainees and conducted 72 research publications. The department received \$1.09M in new funding and initiated 8 new research projects.

Trainees at BCCA (2023)

- BC Cancer Pathology trained 53 trainees, primarily residents rotating through BCCA Pathology

Faculty and Staff Involvement in Teaching

- **Total Involved:** All of our pathologists and scientists, totaling 23, participated in trainees' teaching

Curriculum Changes in 2023

- No Significant Changes
- **Context:** Competency-Based Design (CBD) was implemented a couple of years prior

Planned Developments for Student Training Programs (Next Academic Year)

- **New Capacity:** Newly renovated office space will host 2 more residents or fellows in BC Cancer pathology
- **Additional Fellows:** 3 new clinical fellows starting this year
- **Challenge:** Overall capacity for trainees' rotation remains tight

Student Feedback on Training Experience

- **Feedback:** All feedback has been excellent
- **Reason:** Very dedicated and knowledgeable staff

Challenges in Delivering Educational Programs

- **Major Challenge:** Eviction by hospital administration, including the closing of 1 of 2 resident rooms
- **Impact:** Limits the number of trainees and prevents implementation of teaching programs
- **Resolution:** Informed UBC Pathology Residency Program to limit trainees to a maximum of 5, down from 7-8. Lack of space for a multiheaded microscope also affects resident training

Research Activities Overview

- **Total Publications:** 72
- **New Research Initiatives/REB Approved:** 8
- **Total New Grants Funded (as PI):** 11
- **Total New Funding Received (as PI):** \$5,243,441
- **Tumor Banks Led by BC Cancer Pathologists:** Lymphoma, Lung, GU

Student Involvement in Research

- All research projects involve trainees, including graduate students, medical students, residents, and fellow

SIGNIFICANT RESEARCH INITIATIVES IN 2023



Dr. Christian Steidl, Executive Director, Research at BC Cancer Research Centre; Research Director of Centre for Lymphoid Cancer; Head, Department of Lymphoid Cancer Research

BC CANCER LYMPHOMA GROUP

The following are two significant research initiatives submitted by the BC Cancer Lymphoma Group, led by Dr. Christian Steidl and Dr. David Scott. These projects exemplify the group's commitment to advancing lymphoma care through innovative research and clinical applications.

Project 1: Implementation of Digital Gene Expression Assay, LExA120 at BC Cancer: Since 2018, the Centre for Lymphoid Cancer (CLC) team at BC Cancer (BCC) has been leading a large-scale applied research project to address the most significant knowledge gap in lymphoma care: understanding the biology of relapsed lymphoid cancers. This pan-Canadian study is funded by Genome Canada, Genome BC, Canadian Institutes of Health Research, and the BC Cancer Foundation.

Key Contributions:

Development of Assays:

- **Development of Lymph2Cx:** A digital gene expression-based platform (20-gene assay) applied to FFPE biopsies to assign cell-of-origin (COO) in DLBCL.
- **Modification to Lymph3Cx:** Expanded the assay to include 58 genes to distinguish PMBCL from DLBCL subtypes, resulting in the Lymph3Cx assay.
- **DLBCL90 Assay:** Further modified the assay to identify clinically and biologically distinct patient groups with double hit or dark zone signatures, leading to the development of the 90-gene DLBCL90 assay.

- **LExA120 Assay:** Incorporated all subclassification features into one assay, named LExA120, which underwent cross-validation in BC and Ontario. Achieved BC College of Physicians and Surgeons Diagnostic Accreditation Program (DAP) laboratory accreditation in October 2023.

Clinical Impact: The LExA120 assay is now part of the routine pathology diagnostic work-up of aggressive B-cell lymphomas across the province, significantly advancing precision medicine and improving patient outcomes by providing accurate molecular subtyping.

Published Work:

- Mottok et al., Blood 2018
- Ennishi et al., J. Clin. Oncol, 2018

Project 2: Molecular Subgroups and Clonal Evolution in Relapsed/Refractory DLBCL in BC: This project investigates the biological and clinical heterogeneity of DLBCL, focusing on the molecular subtyping and clonal evolution in relapsed/refractory DLBCL (rrDLBCL) patients. The research team at the Centre for Lymphoid Cancer (CLC) performed a population-based study on over 1,100 patients diagnosed with DLBCL between 2005 and 2010 in British Columbia.

Key Contributions:

- **DZsig Identification:** Defined a germinal center-origin, aggressive B-cell lymphoma signature (DZsig) with lower 2-year overall survival outcomes.
- **Whole Genome/Exome Sequencing:** Performed sequencing on paired tumour biopsies from 73 patients, revealing significant insights into the mutational divergence and clonal evolution associated with relapse timing.
- **Clinical Management Recommendations:** Suggested that late relapses can be managed as genetically distinct diseases sensitive to immuno-chemotherapy, while refractory and early relapse diseases may require alternatives to chemotherapy.

Clinical Impact: This study emphasizes the need for refined molecular profiling to identify high-risk DLBCL subgroups that would benefit from more aggressive therapeutic regimens. It also provides a basis for tailored treatment strategies for rrDLBCL patients, potentially improving their outcomes.

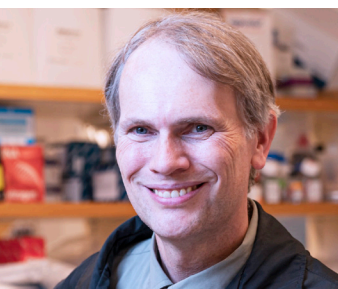
Published Work:

- Alduaij et al., Blood, 2023
- Hilton et al., JCO 2023



INTERNATIONAL KI67 IN BREAST CANCER WORKING GROUP

Introduction: Dr. Torsten O. Nielsen, Professor of Pathology & Laboratory Medicine and MD/PhD Program Director at UBC, leads a research team focused on standardizing the immunohistochemical assessment of the Ki67 biomarker. This biomarker is crucial for stratifying risk and guiding treatment in breast cancer. Since 2011, the team, which includes renowned experts from UBC and other prestigious institutions, has developed international guidelines and tools to ensure the biomarker's clinical and analytical validity.



Dr. Torsten O. Nielsen, Professor of Pathology & Laboratory Medicine MD/PhD Program Director, Faculty of Medicine, University of British Columbia

Project: Standardizing the Ki67 Biomarker for Breast Cancer. Since an initial meeting in 2011, a team of pathologists, oncologists, and biostatisticians has worked to standardize the immunohistochemical assessment and interpretation of the Ki67 biomarker. Their goal is to ensure it is used in both an analytically and clinically valid way to stratify risk and guide treatment in breast cancer. The leadership group includes Torsten Nielsen and Sam Leung from UBC, along with Mitch Dowsett (London, Royal Marsden), Dan Hayes (University of Michigan), Lisa McShane (US National Cancer Institute), and David Rimm (Yale). This work has resulted in international guidelines for staining and scoring this marker of cancer cell proliferation (Nielsen TO, Leung SC et al. J Natl Cancer Inst 2021 PMID: 33369635), and freely available software tools accessible to pathologists worldwide (<https://www.ki67inbreastcancerwg.org/>).

Key Contributions:

- International Guidelines: Published guidelines for staining and scoring Ki67 in the Journal of the National Cancer Institute.
- Software Tools: Developed tools accessible to pathologists globally ([Ki67 in Breast Cancer Working Group](https://www.ki67inbreastcancerwg.org/)).

Clinical Impact: Contributed to a clinical trial enabling women with low-risk breast tumors to avoid radiation therapy based on Ki67 analyses, published in The New England Journal of Medicine.

Published Work and Presentations:

- Nielsen TO, Leung SC et al. "International guidelines for staining and scoring the Ki67 biomarker." J Natl Cancer Inst. 2021.
- Omitting Radiotherapy after Breast-Conserving Surgery in Luminal A Breast Cancer. N Engl J Med. 2023 Aug 17;389:612-619.

Dr. Poul Sorensen, Professor, Department of Pathology and Laboratory Medicine, Faculty of Medicine, UBC; Director of the Academy of Translational Medicine (ATM)



BC CANCER SORENSEN LAB

As the Director of ATM, Dr. Poul Sorensen has continued to make groundbreaking contributions to pediatric oncology research. In 2023, his work has been instrumental in accelerating pediatric cancer therapeutics from bench to bedside, particularly addressing the urgent need for improved treatments for relapsed or metastatic childhood cancers.

Key Contributions and Clinical Impact:

Pediatric Oncology Research:

- Addressed low survival rates in childhood cancers with innovative research, as featured in Science in Vancouver.
- Led the discovery of tumor-associated surface proteins as potential immunotherapy targets in Ewing sarcoma and other high-risk childhood cancers.
- Senior author of the publication “A MYCN-independent mechanism mediating secretome reprogramming and metastasis in MYCN-amplified neuroblastoma”, which identified novel mechanisms of metastatic capacity in neuroblastoma, published in Science Advances in 2023.

Osteosarcoma Research:

- Awarded \$500,000 USD by the Osteosarcoma Institute for the project “Harnessing the osteosarcoma surfaceome for immunotherapy targets to block metastatic capacity.”
- Focuses on identifying new treatments for metastatic osteosarcoma, which significantly reduces survival rates.

Spatial Metabolome Hubble Project (Metabohub):

- Leads a targeted project within Metabohub with ATM Member Dr. Seth Parker.
- Investigates how tumor cells manage metabolic stress and its impact on CAR-T cell effectiveness, funded with \$2.4 million by the Terry Fox Foundation and the Lotte & John Hecht Memorial Foundation.

Collaborative Efforts:

- Announced collaboration with Massachusetts General Hospital through Derm-Biome Pharmaceuticals Inc., where Dr. Sorensen serves as CSO.
- Involved in Canada’s Immuno-Engineering and Biomanufacturing Hub.



VCH Medical Microbiology and Infection Prevention and Control

Dr. Marthe K. Charles,
Clinical Associate Professor,
Pathology and Laboratory
Medicine; Division Head
Medical Microbiology and
Infection Prevention and
Control, Regional Medical
Director of Infection
Prevention and control VCH

The medical microbiology laboratory has been under a tremendous amount of pressure in the last 4 years. VCH Medical Microbiology and Infection Prevention and Control rose to the occasion, providing fast and reliable results and clinical support when the province needed it the most. Meanwhile, major innovations are needed to prepare for human resource shortages, future pandemics, demographic changes, and changes in the population of care. Below are the actions taken to prepare for those changes.

Project 1: Self-disinfecting Surfaces: Copper in Action: The VCH Medical Microbiology laboratory led a collaborative one-year cross-Canadian partnership between infection control researchers, transit authorities, and private industry to assess the antimicrobial efficacy and durability of three different copper products on high-touch surfaces. In-situ testing demonstrated significant reductions in bacterial colony counts and adenosine triphosphate (ATP) readings on copper surfaces compared to controls. After 200 simulated cleaning events, a norovirus surrogate demonstrated a 99% reduction and a COVID-19 surrogate had a 90-99% reduction on all copper surfaces compared to controls. This groundbreaking study, fully funded by Teck as part of its Copper & Health program, was the first of its kind in North America. The project results led to national and international recognition, with three major publications and a white paper requested by the American Public Transport Association.

Published Work:

- Williams TC, Asselin E, Mazzulli T, Woznow T, Hamzeh H, Nahkaie D, Waisman D, Stojkova B, Dixon R, Bryce E, Charles M. One-year trial evaluating the durability and antimicrobial efficacy of copper in public transportation systems. Sci Rep. 2024 Mar 21;14(1):6765. doi: 10.1038/s41598-024-56225-9. PMID: 38514805; PMCID: PMC10958017.

- Williams TC, Woznow T, Velapatino B, Asselin E, Nakhaie D, Bryce EA, Charles M. In vitro comparison of methods for sampling copper-based antimicrobial surfaces. *Microbiol Spectr*. 2023 Dec 12;11(6):e0244123. doi: 10.1128/spectrum.02441-23. Epub 2023 Oct 17. Erratum in: *Microbiol Spectr*. 2024 Mar 19;:e0031524. PMID: 37847020; PMCID: PMC10714924.
- Charles MK, Williams TC, Nakhaie D, Woznow T, Velapatino B, Lorenzo-Leal AC, Bach H, Bryce EA, Asselin E. In vitro assessment of antibacterial and antiviral activity of three copper products after 200 rounds of simulated use. *Biometals*. 2023 Dec 22. doi: 10.1007/s10534-023-00572-z. Epub ahead of print. Erratum in: *Biometals*. 2024 Feb 14;: PMID: 38133868.

Project 2: Rapid Noninvasive Environmental Screening of Human Pathogens: The VCH Medical Microbiology team advanced scientific knowledge in canine biological scent detection through the Canines For Care (C4C) team. Collaborating with Health Canada, they developed rigorous methodology to train dogs to detect COVID-19. The trained canines showed 100% sensitivity and 93% specificity in identifying COVID-19 in a laboratory setting. They successfully transferred these skills to a clinical setting in a long-term care facility. This research, in collaboration with BC Cancer Research, identified unique volatile organic compounds (VOCs) predictive of positive COVID-19 samples, demonstrating excellent concordance between canines and GC-MS analysis. This significant research adds to the limited studies comparing dog olfaction to GC-MS, enhancing the science of canine biodetection.

Published Work:

- Charles M, Eckbo E, Zurberg T, Woznow T, Aksu L, Gómez Navas L, Wang Y, Bryce E. In search of COVID-19: The ability of biodetection canines to detect COVID-19 odours from clinical samples. *J Assoc Med Microbiol Infect Dis Can*. 2022 Nov 29;7(4):343-349. doi: 10.3138/jammi-2022-0017. PMID: 37397821; PMCID: PMC10312219.
- Charles M, Eckbo E, Zurberg T, Woznow T, Aksu L, Gómez Navas L, Wang Y, Robert O'Neill, BA3, Esther Thompson, BSc, RPN Bryce E. Deployment of canine scent detection for the screening of COVID-19 on pillowcases of residents in a long-term care setting – a pilot study. 2023 Fall, *Canadian Journal of Infection Control* 38 (43), 128-133.
- Charles M, Ruszkiewicz D, Eckbo E, Zurber T, Aksu L, Gomez Navas L, Myers R. The science behind the nose: correlating volatile organic compound characterization with canine biodetection of COVID-19 *ERJ Open Research* Jan 2024, 000072024; DOI: 10.1183/23120541.00007-2024.

Project 3: Automation and Artificial Intelligence in the Microbiology Laboratory: Drawing from its experience with frontline automation (Tarzan®, WASP®, Copan™) since 2008, the VCH Medical Microbiology laboratory has enhanced its capabilities by adding 6 “smart incubators” to the robot. This major installation is the second high volume total laboratory automation in a UBC affiliated centralized laboratory after the one from Dr. Pamela Kibsey in Interior Health Authority (2014). Facing a human resource crisis, the automation of mundane tasks and the integration of artificial intelligence will enable the microbiology laboratory to support community care growth and handle increased volume. The VCH Microbiology laboratory serves 12 healthcare centers and outpatients, processing over 500,000 samples

annually from across the province, including Bella Bella. This total laboratory automation includes North American premiere features like the Radian® for fast automated susceptibility testing and the Colibri® for routine susceptibility and identification testing. This innovation combines automation and AI to improve result times, quality, and operational efficiency.

The new WHO TB strategy aims for an 80% reduction in new TB cases by 2030, with diagnostics playing a central role. Vancouver Coastal is considered low incidence for TB, with 92% of reviewed slides negative for Mycobacterial infection. Technologists spend a minimum of 10 minutes confirming a negative slide. The VCH Medical Microbiology Laboratory has advanced routine microbiology by using automated digital microscopy paired with AI. They demonstrated that automated digital microscopy combined with DNN-trained software can effectively screen and separate positive from negative AFB-smears. In a study of 286 slides, the concordance, positive, and negative agreements between manual and digital microscopy were 95.5%, 96.2%, and 95.2%, respectively. Published in a peer-reviewed journal, these findings support further research and operational efficiency in identifying Mycobacterial infections, contributing to the WHO goal to end TB.



Published Work:

- Desruisseaux C, Broderick C, Lavergne V, Sy K, Garcia D, Barot G, Locher K, Porter C, Caza, Charles MK. 2024. Retrospective validation of MetaSystems' deep-learning-based digital microscopy platform with assistance compared to manual fluorescence microscopy for detection of mycobacteria. J Clin Microbiol 62:e01069-23.

**Dr. Cheryl L Wellington, Professor,
Department of Pathology and Laboratory
Medicine, Faculty of Medicine, UBC**



DMCBH WELLINGTON LAB

Research and Educational Highlights:

- Held 23 active research grants totaling over \$30 million in aggregate funding.
- Awarded two new grants in 2023:
 1. National Institutes of Health: \$6.2 million USD for analytical validation of blood tests for traumatic brain injury (2023-2027).
 2. USA Department of Defence: \$2.5 million USD for improving diagnosis of brain injury caused by intimate partner violence (2024-2028).
- In the process of establishing a Fluid Biomarker Core Facility supported by CFI.
- Published 10 new papers in 2023, with 4 additional papers under review.
- Supervised 11 trainees and 7 staff, graduated 3 BSc students, and taught in the Pathology and Neuroscience graduate programs.

Publications:

- Roles of peripheral lipoproteins and cholesteryl ester transfer protein in the vascular contributions to cognitive impairment and dementia. Poliakova T, Wellington CL. Mol Neurodegener. 2023.
- Age-specific reference intervals for plasma biomarkers of neurodegeneration and neurotrauma in a Canadian population. Cooper JG, et al. Clin Biochem. 2023.
- Pediatric reference intervals for serum neurofilament light and glial fibrillary acidic protein using the CALIPER cohort. Stukas S, et al. Clin Chem Lab Med. 2023.
- Use of Biostatistical Models to Manage Replicate Error in Concussion Biomarker Research. Tabor JB, et al. JAMA Netw Open. 2023.
- Using metabolomics to predict severe traumatic brain injury outcome (GOSE) at 3 and 12 months. Banoei MM, et al. Crit Care. 2023.
- Neuroinflammation and the immune system in hypoxic ischaemic brain injury pathophysiology after cardiac arrest. Sekhon MS, et al. J Physiol. 2023.
- Altered Tau Kinase Activity in rTg4510 Mice after a Single Interfaced CHIMERA Traumatic Brain Injury. Cheng WH, et al. Int J Mol Sci. 2023.

- The Neurovasculome: Key Roles in Brain Health and Cognitive Impairment. Iadecola C, et al. Stroke. 2023.
- Characterizing Factors Influencing Baseline Plasma Biomarkers for Sport-Related Concussion in Adolescents. Tabor JB, et al. J Neurotrauma. 2023.
- Association of CSF and Serum Neurofilament Light and Glial Fibrillary Acidic Protein, Injury Severity, and Outcome in Spinal Cord Injury. Stukas S, et al. Neurology. 2023.



Equity, Diversity, and Inclusion (EDI) Efforts:

- Committed to EDI best practices to address systemic barriers and biases
- Recruited trainees and staff using non-gendered, inclusive language
- Ensured team diversity through targeted recruitment efforts
- Provided EDI and unconscious bias training to lab members
- Supported career progression through accommodations and career leaves

Communication and Outreach:

- Delivered 27 invited research presentations in 2023
- Conducted Departmental Rounds in Dec 2023
- Held a Fluid Biomarker Open House in June 2023
- Featured at various events including the UBC Emeriti Tea and CLEAR Research Day
- Hosted two donor visits and initiated discussions on fluid biomarkers with Northern Health

Dr. James Lan, Assistant Professor, Dept of Pathology and Laboratory Medicine, UBC | Medical Director of the Vancouver Immunology Laboratory and an active transplant nephrologist at VGH



VGH IMMUNOLOGY LABORATORY

Dr. James Lan serves as the current co-Chair of the National HLA Advisory Committee, overseeing the development and implementation of transplant testing technologies and procedures in Canada. His research focuses on the application of precision medicine to improve access, equity, and outcomes in kidney transplantation.

Introduction: The VGH Immunology Laboratory provides high-complexity testing to serve all solid organ and hematopoietic stem cell transplant programs in British Columbia. In 2023, the VGH Immunology Laboratory was the first in Canada to validate the use of nanopore-sequencing technology to perform real-time, granular assessment of donor-recipient HLA compatibility to guide the selection of immunosuppression for kidney transplant recipients. The Immunology Laboratory continues to be a leader nationally and internationally in the development and clinical translation of precision technologies in transplantation medicine.

Key Contributions and Clinical Impact:

Unified Metric for Allo-Sensitization:

- Developed a unified metric to combine the effects of HLA and ABO allo-sensitization.
- Demonstrated reduction in inequity in access to transplantation for candidates from ethnic minority groups.
- Published in the American Journal of Transplantation and presented at various international conferences including the American Transplant Congress, Canadian Society of Transplantation, American Society of Histocompatibility and Immunogenetics, and meetings in Singapore, Saudi Arabia, and Ukraine.

Funding and Research: Received funding from the Canadian Donation and Transplantation Research Program to accelerate ABO-incompatible transplantation in Canada, addressing difficult-to-match candidates on the waiting list.

CanPREVENT AMR Program:

- Co-leads the CanPREVENT AMR program with Drs. Keown and Sherwood, funded by Genome Canada (\$12,000,000).
- Focuses on reducing premature kidney transplant loss due to antibody-mediated rejection through precision medicine technologies.
- Successfully initiated a national Nanopore-based sequencing infrastructure across all 14 Canadian Transplant Immunology Laboratories for rapid, real-time DNA sequencing.

UBC Precision Medicine in Transplantation Research Excellence Cluster:

- Part of a cluster that includes partnerships with institutions in Australia, Germany, and Austria.
- Hosted a 2-day Precision-Tx symposium in December 2022, attracting international experts and Transplant Immunology Laboratories for rapid, real-time DNA sequencing.

For a detailed list of my published work, please see the Publication Section, page # 99.

Dr. Zeid Hamadeh, Clinical Instructor,
Dept of Pathology & Laboratory
Medicine UBC; Lab Scientist, Genome
Analyst, Cytogenomics, Vancouver
Coastal Health

CLINICAL IMPLEMENTATION OF OPTICAL GENOME MAPPING AS A FRONT-LINE DIAGNOSTIC TEST FOR HEMATOLOGICAL NEOPLASMS



The Cytogenomics Lab at Vancouver General Hospital has experienced a pivotal year marked by the successful validation and clinical launch of Optical Genome Mapping (OGM) in November 2023 for testing of acute leukemias.

Introduction: Since November 2023, the Cytogenomics Lab has profiled 61 patients using OGM, achieving a 97% quality control success rate. Clinically significant findings were demonstrated in 49% of cases, influencing treatment decisions.

Validation and Launch: The validation and clinical launch of OGM were presented at numerous national and international conferences, including the 2023 Canadian College of Medical Geneticists (CCMG) annual scientific conference.

Clinical Impact:

- Patients Profiled: 61
- Quality Control Success Rate: 97%
- Clinically Significant Findings: 49% (30/61).

“OGM has influenced treatment discussion and decision on a significant number of patients.”

Future Plans: The lab plans to expand OGM testing to include myelodysplastic syndrome, relapsed acute leukemias, and chronic lymphocytic leukemia.

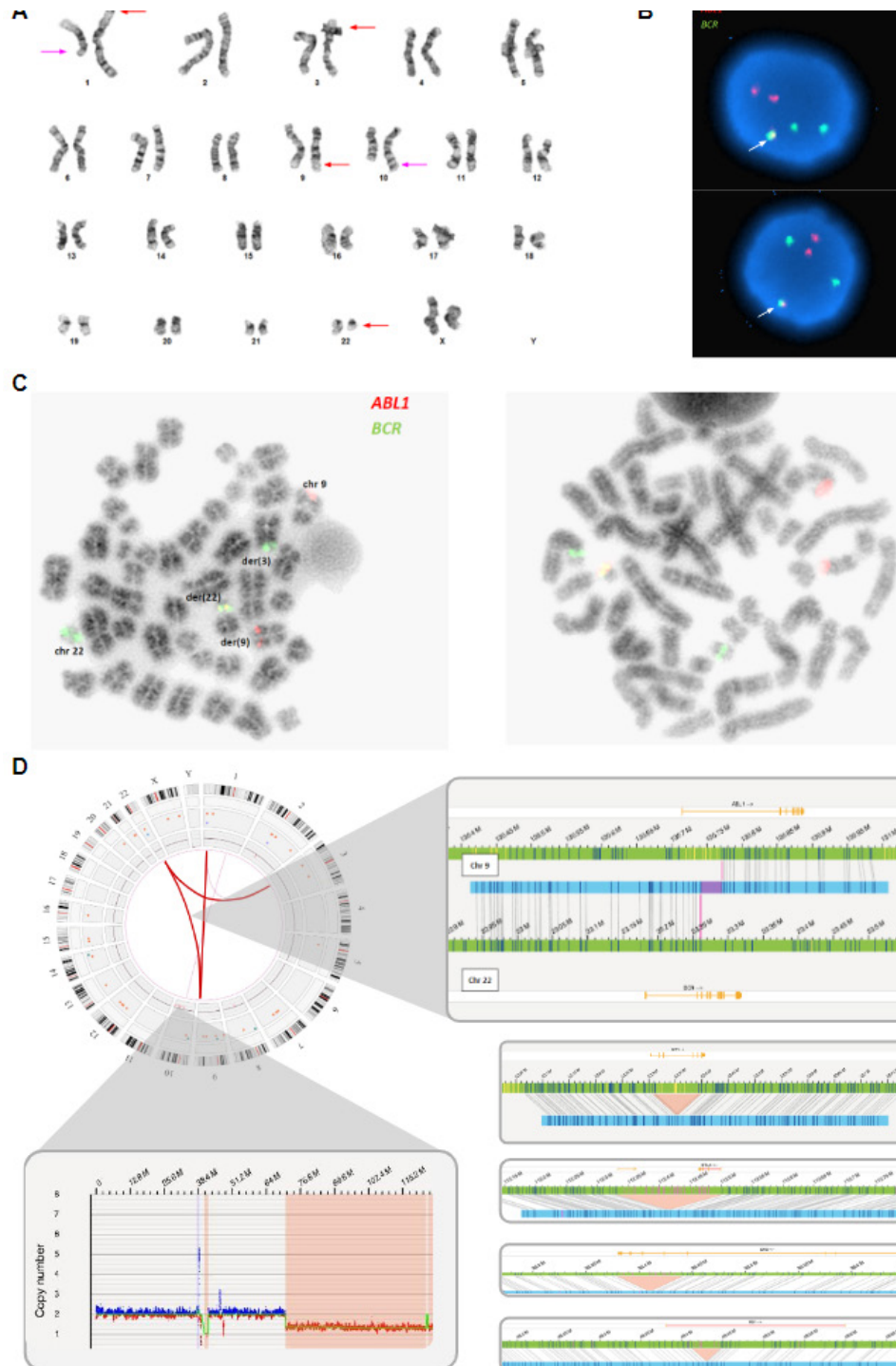
Presented results at:

- 2023 Canadian College of Medical Geneticists (CCMG) annual scientific conference
- 2023 Cancer Genomics Consortium (CGC) conference
- 2023 American Society of Hematology (ASH) conference
- 2024 American College of Medical Geneticists (ACMG) conference

Abstracts have also been accepted for presentation at the 2024 CCMG and 2024 CGC annual meetings, and are under consideration for the 2024 European Society of Human Genetics (ESHG) annual meeting. Furthermore, we are preparing a scientific manuscript based on our exceptional validation data.

Conclusion: OGM is revolutionizing genome diagnostics, uncovering significant alterations previously missed by lower resolution analyses.

Figure #1 Optical genome mapping (OGM) resolves a complex case of acute myeloid leukemia (AML) with higher resolution and accuracy compared with karyotype and FISH. **A** Karyotype analysis shows a complex karyotype with a four-way translocation between chromosomes 1, 3, 9 and 22 and an unbalanced rearrangement between chromosomes 1 and 10. **B** Interphase and **C** Metaphase FISH using a BCR/ABL1 probe set confirmed the presence of the *BCR::ABL1* fusion and revealed one fusion signal on the derivative chromosome 22, one *ABL1* signal on the long-arm of both the normal and derivative chromosome 9, and one *BCR* signal on the normal chromosome 22 and derivative chromosome 3, consistent with the observed four-way translocation. **D** OGM detected the presence of a 4-way translocation positive for the *BCR::ABL1* fusion, an unbalanced rearrangement between chromosomes 1 and 10 that involved a large terminal deletion of chromosome 10 and several prognostically relevant small intragenic deletions, including *IKZF1*.



Dr. David Goldfarb, Clinical Associate Professor, Pathology and Laboratory Medicine, UBC; Medical Microbiologist, BC Children's Hospital

SALINE GARGLE SAMPLE COLLECTION FOR COVID-19 TESTING IN BOTSWANA



Project: Saline Gargle Sample Collection for COVID-19 Testing in Botswana:

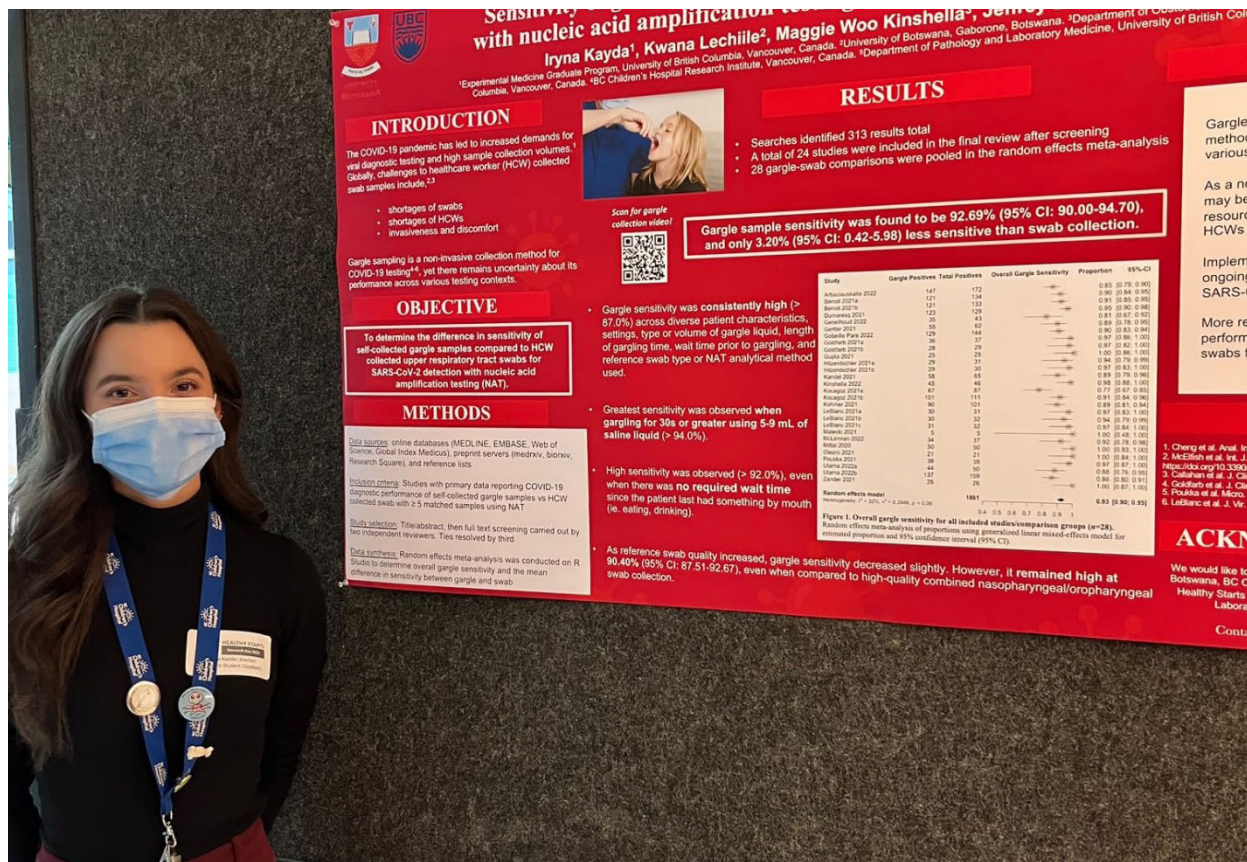
First pioneered by BC Children's Hospital researchers, saline mouth rinse gargle (SG) collection has been implemented in Canada and globally as an alternative to nasopharyngeal (NP) swabs for COVID-19 testing. SG samples can be self-collected, reducing the need for trained health workers and the amount of personal protective equipment and flocked swabs needed, with near equivalent diagnostic validity. While SG samples have the potential to support resource-limited health settings, innovative sample methods are infrequently clinically validated in low- and middle-income countries. Botswana, as a resource-limited health setting, stands to benefit from the scale-up of this method to address a gap in COVID-19 testing.

Key Contributions: Through the leadership of Dr. David Goldfarb at the Department of Pathology and Laboratory Medicine at BC Children's, in collaboration with the Institute of Global Health, the University of Botswana, and the Botswana-Harvard Partnership, data on the performance of SG collection for COVID-19 testing was systematically compiled. This effort led to the clinical validation of SG sample collection methods for COVID-19 testing in Botswana.

Clinical Impact: The project not only validated SG sample collection within a resource-limited health setting but also supported research by Botswanan investigators into direct PCR molecular testing of SG samples to streamline laboratory workflows, and Next-Generation Sequencing of SG samples for COVID-19 variants. Furthermore, it facilitated capacity building for trainees in Canada and Botswana, resulting in Masters degrees from UBC and the University of Botswana.



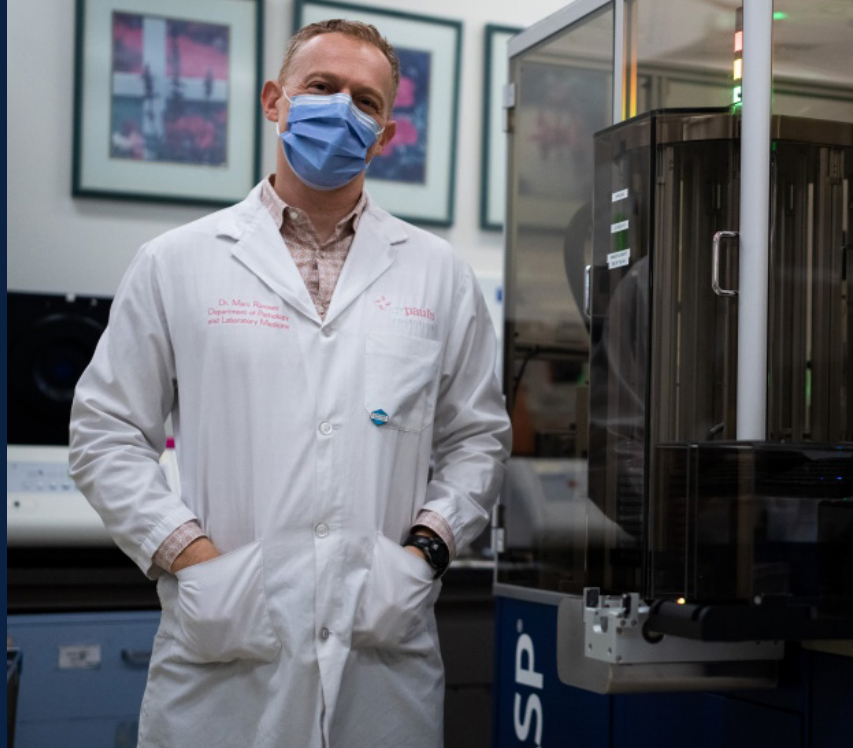
Kwana Lechille led the clinical validation study in Botswana for her MPhil in Medical Sciences at the University of Botswana. She is anticipating to graduate in 2024.



Ryana Kayda led the systematic review on the sensitivity of gargle sample collection compared to swabs for SARS-CoV2 detection. She graduated with an MSc in Experimental Medicine from UBC in Nov 2023.

Dr. Marc Romney, Clinical Professor,
Pathology and Laboratory Medicine,
UBC; Medical Microbiologist St. Paul's
Hospital

INSTALLATION OF AI-ASSISTED LABORATORY SYSTEM AT ST. PAUL'S HOSPITAL



Project: Installation of AI-Assisted Robotics at St. Paul's Hospital:

Dr. Marc Romney, Head of Medical Microbiology and Virology, introduced the new AI-assisted machine designed to enhance the microbiology laboratory at St. Paul's Hospital in Vancouver. This significant investment of \$1 million has led to the installation of an advanced automated AI-based system for setting up bacterial cultures. The new system employs artificial intelligence and sophisticated robotics to manage repetitive tasks, thereby allowing human staff to focus on more complex and critical work.

Key Contributions: The AI-based lab system, known as the WASPLab (Walk-Away Specimen Processor), features two robots, affectionately named Tarzan and Jane. These robots utilize artificial intelligence to process up to 70 percent of the hospital's microbiology samples. They perform tasks such as unscrewing specimen tubes and streaking samples onto bacterial culture plates. This automation of clinical microbiology marks a significant advancement, being the first of its kind in Western Canada; moreover, it significantly streamlines the workflow within the lab.

Clinical Impact: St. Paul's Hospital processes over 145,000 microbiological samples each year from British Columbia and Yukon. The introduction of the WASPLab system has significantly improved efficiency by automating routine and manual tasks. This innovation has provided the laboratory staff with greater flexibility, enabling them to concentrate on more intricate analyses. While the system occasionally requires human oversight for error correction, the overall impact has been highly positive, with increased productivity and reduced turnaround times for sample processing.

Partnerships and Future Developments: The development and customization of the WASPLab were achieved through close collaboration with Copan, an Italy-based manufacturer of laboratory automation and innovation. This project was generously funded by a donor and the St. Paul's Hospital Foundation, demonstrating a successful partnership that has paved the way for future advancements in laboratory automation. Plans are already in place to implement a second WASPLab in a state-of-the-art laboratory at the new St. Paul's Hospital, set to open in 2027.

Dr. Jay Kizhakkedathu, Professor at the Centre for Blood Research, Department of Pathology and Laboratory Medicine and Department of Chemistry at the University of British Columbia

INNOVATIVE TREATMENT TARGETS BLOOD CLOTS WITHOUT INCREASED BLEEDING RISK



Project: Innovative Treatment Targets Blood Clots Without Increased Bleeding Risk:

Dr. Jayachandran Kizhakkedathu, a professor and Canada Research Chair at UBC's Department of Pathology and Laboratory Medicine and the UBC Centre for Blood Research, led the development of MPI 8. His innovative approach targets polyphosphate, a molecule involved in blood clotting that accelerates the process but is not essential for it. This strategy differs from existing blood thinners that target enzymes essential for blood clotting and carry a significant risk of bleeding. The expertise of Dr. Kizhakkedathu and his team at UBC's Centre for Blood Research was crucial in creating a compound that can bind to polyphosphate and inhibit its action, effectively reducing the risk of bleeding while preventing blood clots.

Clinical Impact: The development of MPI 8 represents a major breakthrough in the field of blood clot prevention and treatment. By targeting a specific molecule involved in clot formation without disrupting the natural clotting process, MPI 8 has proven to be safer and more effective in animal models. This discovery holds enormous potential to improve human lives by reducing the risk of bleeding associated with current blood thinners. Initial preclinical studies in mice demonstrated MPI 8's remarkable effectiveness in preventing blood clots without increasing bleeding risk and showed no signs of toxicity, even at high doses.

Published Work:

- This research was published in Nature Communications: La, C.C., Smith, S.A., Vappala, S. et al. Smart thrombosis inhibitors without bleeding side effects via charge tunable ligand design. Nat Commun 14, 2177 (2023). <https://doi.org/10.1038/s41467-023-37709-0>

Dr. Lucy Perrone, Donald B. Rix Professor of Laboratory Quality Chair, CMPT Director, Program Office for LQM, Associate Professor, Dept of Pathology & Laboratory Medicine

ACCOMPLISHMENTS SUMMARY: LABORATORY QUALITY PROGRAMS INCLUDING CMPT 2023

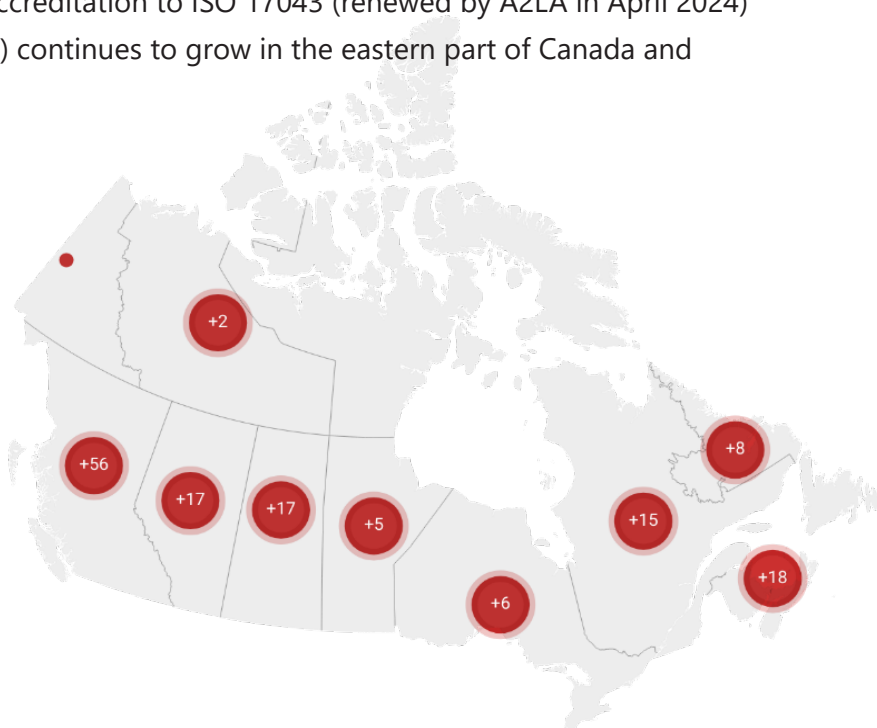


The University of British Columbia thanks the Rix Family Foundation for playing an integral part in advancing our understanding of how we can improve the quality of laboratory services worldwide. British Columbia's medical community is thankful for Dr. Rix's unwavering commitment to medical mentorship, the well-being of British Columbians and the advances he made in laboratory quality assurance. UBC and Dr. Lucy Perrone, the inaugural Donald B. Rix Professor in Laboratory Quality at UBC, are pleased to present this update.

Global Initiatives:

CMPT:

- Number of EQA schemes in microbiology expanded to 19 programs now. These are now officially included in the new scope of accreditation to ISO 17043 (renewed by A2LA in April 2024)
- EQA Enrollment (see map blow) continues to grow in the eastern part of Canada and internationally to:
 - Georgetown, Guyana
 - Ljubljana, Slovenia
 - Coventry, UK
 - Uppsala, Sweden
 - Olympia, WA, USA
 - St. David's Island, Bermuda





- Dr Perrone visited The Medical Research Council Unit of The Gambia at the London School of Hygiene & Tropical Medicine in Banjul The Gambia in June 2023 and will return to Banjul this June to plan for their development as an EQA provider in West Africa.
- New CMPT contracts are expect in 2024 for Burundi, the Gambia and Oman.
- 17 students from Ethiopia completed CMPT's continuing professional development course in microbiology.
- International EQA training restarted. CMPT is hosting 2 trainees from Oman CPHL in August 2024.

POLQM:

- 72 students enrolled in LQM certificate - 27 from The Gambia, 14 from outside of Canada representing 10 countries. (In other words, 31 students from Canada, 41 students from outside of Canada representing 11 countries.)
- Launched new micro-certificate in Antimicrobial Susceptibility Testing and Interpretation. 27 students enrolled in AST&I Micro certificate- 9 from outside of Canada representing 7 countries.
- Lab Quality Conference- In June 2023, POLQM hosted a hybrid-format laboratory quality conference featuring more than 20 speakers and 140 delegates attending in person or by video link. This year's theme was "Ensuring Quality in a Changing Diagnostic Landscape" and attracted international participants. Dr. Perrone secured sponsorship from Providence Health Care, a health and wellness resource for families, patients and residents from all parts of British Columbia, and LifeLabs, which performs laboratory tests to help diagnose, treat, monitor and prevent diseases for millions of Canadians.





International projects and impact:

1. Bangladesh:

In 2023 Dr. Perrone served as a Senior Advisor to the Ministry of Health and Family Welfare in Bangladesh to write the National Public Health Laboratory Strategy for Infectious Diseases 2024-30. This work includes extensive stakeholder engagement and communication, conducting a comprehensive situation and SWOT analysis, revising the national strategy and supporting the development of a budgeted operational plan with Ministerial validation and national laboratory implementation of the strategy.

Project Outputs: National Public Health Laboratory Strategy for Infectious Diseases. Ministry of Health and Family Welfare, Bangladesh. (2024). English.

2. The Gambia - Development of The National Essential Diagnostics List:

Access to quality, affordable, and appropriate health products is indispensable to advance universal health coverage, address health emergencies, and promote healthier populations. WHO published The First Model List of Essential in Vitro Diagnostics (EDL) in May 2018, in order to provide a new tool for governments to prioritize in vitro diagnostics for national decision making. The model EDL is intended to serve as a reference resource that countries can adapt to their context to develop or update their own national essential diagnostic lists (NEDLs). A NEDL has the potential to positively impact public and private health care delivery through highlighting which diagnostics should have been prioritized for funding, through the standardization of test methodologies and allocation of tests across the tiered health system, and the alignment of stakeholder perspectives on the importance of diagnostics.

To help accelerate NEDL development, Dr. Perrone supported the Foundation for Innovative New Diagnostics (FIND), the WHO and several international organizations to develop and implement tools that support countries in their development of NEDLs.

Project Outputs: First National Essential Diagnostics List (2024). Ministry of Health, The Gambia. (2024). English.

THE INFECTION PREVENTION AND CONTROL (IPAC) CERTIFICATE



The Infection Prevention and Control (IPAC) Certificate Program:

The Infection Prevention and Control (IPAC) Certificate has received a three-year endorsement from IPAC Canada, a national association dedicated to promoting best practices and advancing knowledge in infection prevention and control. Additionally, the Ministry of Health has allocated funding for the UBC IPAC certificate program to support and encourage infection prevention and control education of healthcare workers within B.C. Since 2021, we have reimbursed 27 eligible students covering tuition and textbook expenses.

The IPAC Certificate is currently undergoing revision and will be consolidated into a 25-week online program. This comprehensive program, led by Drs. Aleksandra Stefanovic, Elisa Lloyd-Smith, Ghada Al-Rawahi, and Titus Wong, is being developed in collaboration with Extended Learning and is generously supported by the Ministry of Health.



05

APPENDIX:
FUNDING AND
PUBLICATIONS FOR
2023

FACULTY GRANTS AND RESEARCH FUNDING 2023

Source: Faculty Activity Database (FAD)

These grants are led by our faculty members who are serving as the principal investigators. This table shows only grants received in 2023, not ongoing grants from previous years.

Principal Investigator Grants

Aparicio, Samuel	2023 - 2025	Mark Foundation	The Origins of CIN: Deconstructing compound copy-structural mutational process phenotypes of cancers at single gene and genome resolution	\$250,000 USD
Aparicio, Samuel	2023 - 2025	National Institutes of Health	New York Genome Characterization Center: Somatic Mosaicism across Human Tissues	\$1,500,000
Aparicio, Samuel	2023 - 2028	Canadian Institutes of Health Research (CIHR)	Mechanisms and targeting of repair deficient cancers with G-quadruplex small molecule ligands	\$1,048,050
Aparicio, Samuel	2023 - 2028	CIHR	Decoding the impact of single cell mutational processes in triple negative breast cancer and high grade serous ovarian cancer	\$1,040,400
Aparicio, Samuel	2023 - 2024	Breast Cancer Research Foundation	Developing predictive biomarkers for genome targeting agents in TNBC, to single cell resolution	\$301,185
Aparicio, Samuel	2023 - Present	Royal Society	Wolfson Visiting Fellowships	\$139,512
Aparicio, Samuel	2023 - 2024	CIHR	Decoding the impact of single cell mutational processes in triple negative breast cancer and high grade serous ovarian cancer	\$100,000
Aparicio, Samuel	2023 - 2024	Canadian Cancer Society	2022 Robert L. Noble Prize	\$20,000
Aparicio, Samuel	2023 - 2025	MacMillan Family Foundation	Bulk and single cell base oxidation chemistry for detecting modified cytosine bases	0
Aparicio, Samuel	2023 - 2025	MacMillan Family Foundation	Copy number alterations and epigenetic rewiring in single cells that affect the activity and efficacy of genome-targeting drugs	0
Bally, Marcel	2023 - 2026	Nanomedicines Innovation Network (NMIN)	Nano-Medicines for treatment of a H1N1 Flu model and of potential use in the treatment of other models of airway infection models	\$200,000
Bally, Marcel	2023 - 2024	University of Victoria	Nanotherapeutics Clusters	\$100,000
Bally, Marcel	2023 - 2025	NanoMedicines Innovation Network (NMIN)	Irinosome High C: a novel liposomal formulation of Irinotecan for treatment of cancers	\$50,000
Bally, Marcel	2023 - 2025	NanoMedicines Innovation Network (NMIN)	PharmaCore: Strategic Plan and Vision	\$48,000

Bally, Marcel	2023 - 2025	NanoMedicines Innovation Network (NMIN)	PharmaCore: Business Planning and NMIN Legacy Implementation Strategy Development	\$48,000
Bally, Marcel	2023 - 2025	NanoMedicines Innovation Network (NMIN)	MicroRNA-inhibitor delivered in lipid nanoparticles to reduce lung injury in mouse models of acute respiratory distress syndrome	\$18,245
Bashashati, Ali	2023 - 2029	NSERC Collaborative Research and Training Experience (CREATE) program	MULTi-Scale multi-modal Image & omics Computing for health (MUSIC)	1,650,000
Bashashati, Ali	2023 - 2029	Canadian Institute for Health Research (CIHR)	Artificial intelligence-driven computational pathology platform for bladder Cancer subtyping (REACT)	1,055,000
Bennewith, Kevin	2023 - 2026	BC Cancer Foundation	Basic/translational research to improve radiotherapy efficacy for localized and metastatic cancer	\$266,667/yr
Bennewith, Kevin	2023 - 2026	Canadian Cancer Society Challenge Grant	Repurposing the angiotensin II receptor blocker telmisartan to promote anti-tumour immune responses	\$170,000
Bennewith, Kevin	2023 - 2023	BC Cancer Foundation Innovation Support Fund	Scintica InvivoO2 500 sterile hypoxia chamber	\$76,500
Chen, Michael	2023 - Present	Vancouver Island Health Authority Catalyst Grant	Rapid Pathogen Identification Using Lipidomics in Ventilated Patients with Pneumonia	\$100,000
DeMarco, Mari	2023 - Present	Alzheimer Society & CIHR	CCNA " Knowledge Translation Exchange Program	\$10,000
Dubland, Joshua (Project Co-Lead with Wang, Ying)	2023 - 2024	UBC Precision Health Catalyst Grant	Who will benefit from colchicine to reduce heart attacks?-Characterizing the inflammation baseline status of patients with coronary atherosclerosis	\$50,000
Gao, Zu-Hua	2023 - Present	Canadian Cancer Society Team Grant	Hydrogel-based adhesive artificial mucosa: a paradigm-shifting platform for postsurgical wound repair, local precision therapy and prevention of cancers of the esophagus and stomach.	\$1,500,000
Gao, Zu-Hua	2023 - 2025	Canada Foundation for Innovation / John R. Evans Leaders Fund	Hydrogel-based adhesive artificial mucosa (HAAM); a novel versatile platform for cancer therapy and prevention	\$317,551
Geltink, Ramon	2023 - 2028	The Canadian Institutes of Health Research	Glucose restriction-mediated changes to mitochondria as a driver of anti-tumour CD8+ T cell function.	\$983,026
Geltink, Ramon	2023 - 2024	Michael Cuccione Foundation	Reverse-engineering CAR-T cells for better solid tumour infiltration	\$152,000
Geltink, Ramon	2023 - 2025	Canucks for Kids Diabetes Laboratories / BC Children's Hospital Foundation	Beta cell triosephosphate isomerase (TPI) as a novel therapeutic target in diabetes	\$70,000
Goldfarb, David	2023 - 2024	BC Ministry of Health Innovation Pathway Program	Evaluation and Implementation of Self-Collected Sample Types for COVID-19, RSV, and Influenza	\$50,000

Hirsch-Reinshagen, Veronica	2023 - 2027	CIHR	Neuropathology of cognitive impairment in chronic schizophrenia	\$604,352
Hirsch-Reinshagen, Veronica	2023 - 2027	CIHR	Neuropathology of cognitive impairment in chronic schizophrenia	\$151,088
Huntsman, David	2023 - 2027	Department of Defense	The Ovarian Cancer Observatory: Prevention, Impact, and Learning from Opportunistic Salpingectomy	\$880,000
Karsan, Aly	2023 - Present	Canada Foundation for Innovation	Overcoming therapy resistance in leukemia	\$1,987,890
Hoang, Linda	2023 - 2024	CIHR Global Health Research Pilot Project	Globally Emerging Food and Waterborne Parasitic Diseases BC Centre for Disease Control, Canada and National Institute of Hygiene and Epidemiology, Vietnam	\$96,594
Karsan, Aly	2023 - 2026	Terry Fox Research Institute	Single cell sequencing to interrogate the evolving clonal structure of leukemia from diagnosis to relapse	\$198,000
Kizhakkedathu, Jayachandran	2023 - 2029	NSERC-CREATE	Charging into the Future (CITF): Training in Polyelectrolyte Biosystems for Tomorrow's Health Challenges	\$1,650,000
Kizhakkedathu, Jayachandran	2023 - 2026	CIHR	Localized immuno-cloaking organ engineering approach to prevent transplant rejection without immunosuppressants	\$803,250
Lam, Wan	2023 - 2027	Terry Fox Research Institute (TFRI)	The Terry Fox New Frontiers Program Project in The Environment and Lung Cancer	\$2,400,000
Lan, James	2023 - 2024	CDTRP - Canadian Donation and Transplantation Research Programme - Research Innovation Grant Competition	Accelerating the Translation of a Novel Luminex Anti-ABO Antibody Detection Technology to Expand the Use of ABO-Incompatible Transplantation in Canada	\$30,000
Lockwood, William	2023 - 2027	Terry Fox Research Institute - New Frontiers Program Project Grants	Environment and Lung Cancer	\$2,400,000
Lockwood, William	2023 - 2025	Cancer Research Society	ILK as a mediator of drug tolerant persister cell survival and target for combination therapy in EGFR mutant lung adenocarcinoma	\$125,000
Lockwood, William	2023 - 2024	Canadian Institutes for Health Research - Project Grant Priority Award in Cancer Research	SNF2 Histone Linker PHD RING Helicase as a novel tumor suppressor gene and risk factor in lung adenocarcinoma development	\$100,000
Luo, Honglin	2023 - 2028	CIHR (Project grant)	Innate inflammatory mechanisms of viral myocarditis: Role of the cytosolic DNA-sensing pathway	\$910,350
McGinnis, Eric	2023 - Present	UBC Faculty of Medicine	Rapid targeted gene sequencing and high-resolution optical genome mapping to optimize selection of targeted therapies in acute myeloid leukemia	\$50,000

McGinnis, Eric	2023 - 2025	Blood Efficiency Accelerator Program Award 2022 Agency: Canadian Blood Services	Demonstration of genetic blood group transition in patients undergoing ABO-mismatched hematopoietic stem cell transplantation by peripheral blood quantitative polymerase chain reaction targeting the ABO locus	\$30,000
Minchinton, Andrew	2023 - 2025	Pancreas Centre BC	Hypoxia in Pancreatic Cancers: Turning a Liability into a Therapeutic Benefit	\$100,000
Minchinton, Andrew	2023 - 2023	BCCF Innovation Support Fund	Mass Spectrometry detector of HPLC	\$90,000
Nielsen, Torsten	2023 - 2028	CIHR	Translating Epigenomics into Clinical Care for Synovial Sarcoma	\$949,000
Nielsen, Torsten	2023 - 2024	CIHR - Project Grant - Priority Announcement: Pediatric Cancer Research	Epigenomics into Clinical Care for Synovial Sarcoma	\$100,000
Park, Yongjin	2023 - Present	Canada Research Chair Tier-2	Integrative Causality Inference of Cancer Mechanisms	\$600,000
Quandt, Jacqueline	2023 - 2024	Djavad Mowafaghian Centre for Brain Health Kickstart Grant	Validating ZDHHC9 as a therapeutic target for Multiple Sclerosis	\$40,000
Quandt, Jacqueline	2023 - Present	VGH and UBC Hospital Foundation	VGH & UBC Hospital Foundation's Most Urgent Needs Fund	\$29,000
Quandt, Jacqueline	2023 - 2024	UBC FOM Development Office - Philanthropic Support	Trainee support - biomarker development award	\$10,000
Rakic, Bojana	2023 - Present	BC Children's Hospital Department of Pathology & Laboratory Medicine	Pilot project to evaluate point of care testing in MSUD patients	\$2,500
Schaeffer, David	2023 - 2030	VGH and UBC Hospital Foundation and Vancouver Coastal Health Research Institute (VCHRI)	Pancreatic Cancer Research Chair at Vancouver General Hospital	\$3,000,000
Sorensen, Poul	2023 - 2024	Rutledge Foundation	Targeting the IL1RAP surface protein for immunotherapy in Ewing sarcoma	USD\$ 70,250 out of USD\$ 100,000
Sorensen, Poul	2023 - 2025	Osteosarcoma Institute	Harnessing the osteosarcoma surfaceome for immunotherapy targets to block metastatic capacity	USD\$ 500,000
Sorensen, Poul	2023 - 2024	St.Baldrick's Foundation - PCDT	Circumventing Ewing Sarcoma Antigen Heterogeneity by IL1RAP and B7-H3 Dual-Targeting Bispecific Antibody Drug Conjugates	USD\$ 50,000 out of USD\$ 100,000
Sorensen, Poul	2023 - 2027	Team Jack Foundation	Deciphering eEF2K biological functions for therapeutic targeting of pediatric medulloblastoma	\$USD 290,000
Sorensen, Poul	2023 - 2027	Terry Fox Research Institute (TFRI)	The Spatial Metabolome Hubble Project to Decipher Tumor-Driven Immunosuppression (MetaboHUB)	\$337,050 out of \$2,000,000
Steidl, Christian	2023 - 2025	Cancer Research Society	Functional characterization of TMEM30A loss-of-function mutations in DLBCL	\$125,000
Setiadi, Audi	2023-2026	BCCH Pathology & Laboratory Medicine Seed Grant	Pilot Project for the Evaluation of Automated Plasma Cytokine Analysis for CAR-T cell associated Cytokine Release Syndrome	\$10,000

Takei , Fumio	2023 - 2028	Canada Institute of Health Research	Innate lymphoid cells in hepatitis and liver fibrosis	\$1,065,000
Venturutti, Leandro	2023 - 2028	Canadian Cancer Society (CCS)	Predicting and targeting extranodal presentation in aggressive B-cell lymphomas.	\$550,000
Venturutti, Leandro	2023 - 2023	Canadian Foundation for Innovation (CFI) & B.C. Knowledge Development Fund (BCKDF)	Delineating aggressive B-cell lymphomas heterogeneity and pathogenic trajectories to optimize cell-based immunotherapies	\$500,000
Venturutti, Leandro	2023 - 2023	BC Cancer Foundation (BCCF)	Data Analysis Computers for Core Facility	\$12,150
Verchere, Bruce	2023 - 2025	Stem Cell Network	Genetic engineering of hESC-derived insulin-producing cells to improve graft outcomes in type 1 diabetes	\$600,000
Verchere, Bruce	2023 - 2024	CIHR (Bridge Grant)	Genetic and acquired defects in islet prohormone processing	\$100,000
Verchere, Bruce	2023 - 2025	Diabetes Canada	Islet prohormone processing and beta cell dysfunction in type 1 diabetes	\$100,000
Verchere, Bruce	2023 - 2025	Stem Cell Network	Genetic manipulation of hES-derived insulin producing cells to improve graft outcomes	\$94,500
Wang , Ying	2023 - 2024	UBC Precision Health Catalyst Grant	Who will benefit from colchicine to reduce heart attacks?-Characterizing the inflammation baseline status of patients with coronary atherosclerosis	\$50,000
Wang, Gang	2023 - 2025	Canadian Cancer Society	Toward an immunohistochemical model for molecular subtyping and predicting of treatment response in bladder cancer.	\$125,000
Wang, Gang	2023 - 2024	AstraZeneca	Institutional review for prostate cancer oncopanel testing in BC Cancer	\$50,000
Wang, Gang	2023 - 2024	University of British Columbia	Innovative deep-learning based program for cervical cancer screening	\$50,000
Wang, Gang	2023 - 2024	University of British Columbia	A deep-learning based automatic bladder cancer screening pipeline.	\$25,000
Wellington, Cheryl	2023 - 2027	National Institutes of Health (NIH) (USA)	Analytical characterization and validation of blood-biomarkers for monitoring TBI evolution	6,240,133 (US)
Wellington, Cheryl	2023 - 2027	Canadian Institutes of Health Research (CIHR)	Using translational biomarkers to define whether plane of motion and complexity of head kinematics modifies biomarker and neuropathological responses to concussion in mice and humans	1,293,201 (CAD)
Wellington, Cheryl	2023 -	2023 DMCBH Alzheimer Disease Research Grant	The role of Inflammatory bowel disease in the development of Alzheimer disease	
Xiong, Wei	2023 - 2023	PHC's inaugural Planetary Health Funding Award	Their groundbreaking research project will delve into the examination of greenhouse emissions from digital pathology in comparison to traditional glass-slide pathology	\$3,000

Yip, Stephen	2023 - 2026	Michael Smith Health Research BC	2022 Health Professional- Investigator Program - "Accelerating Comprehensive Diagnosis of Glioma patients in BC – the long and short of it"	\$450,000
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These grants highlight collaborative research efforts where our faculty members are serving as co-principal investigators, demonstrating their contributions to joint research initiatives.

Co-Principal Investigator Grants

PI	CO-PI	Date	Agency	Title	Amaoun
Joan Brugge	Aparicio S , Livingston D, Venkitaraman A, Dillon D, Santagata S, Gambhir S	2023 - 2023	Gray Foundation	Development of strategies to track and prevent breast cancer development in BRCA mutation carriers	\$205,000 USD
Ramon Klein Geltink	Kevin Bennewith (10%), Francis Lynn, Yongjin Park	2023 - 2028	Canadian Institutes of Health Research	Glucose restriction-mediated changes to mitochondria as a driver of anti-tumour CD8+ T cell function	\$196,605/yr (10%)
Elizabeth King	Helene Cote , Melanie Murray, Chanson Brumme, Stacey Tkachuk	2023 - 2024	CIHR	Effects of age on antiretroviral concentrations and adverse drug reactions for women with HIV	\$100,000
Elizabeth King	Helene Cote , Melanie Murray, Chanson Brumme, Mark Hull, Stacy Tkachuk, Alice Tseng, Shelly Tognazzini	2023 - 2027	CIHR project grant - Community Based Research	REDOSE-Women: ReEvaluating antiretroviral Drug Concentrations and Side Effects in older women	\$499,027
Michael Anglasio	Helene Cote , Ali Bedaiwy Mohamed, Paul Young, Gillian Hanley, Basile Tessier-Cloutier, A Lee , A Talhouk	2023 - 2024	CIHR	Cancer-driver events in normal endometrium: impact on healthy aging and reproduction	\$100,000
John Best	DeMarco ML	2023 - Present	CIHR - Catalyst Grant	Cognitive aging in middle and older-aged Canadians: Consideration of genetic risk, modifiable factors, and biological sex	\$68,970
Jessica Liauw	Jennifer Hutcheon, David Grynsan	2023 - Present	BCCHR Catalyst grant (Co-Applicant)	Placental Growth Factor to Reduce Urgent Maternal and Neonatal Transport in BC: A pilot study	\$39,920
B. Shagdan, B. Kwon	A Macnab, M Sekhon, A Purang, E Sayre, G Dumont, B Molavi, V Hirsch-Reinshagen , B Gribbons	2023 - 2026	US Department of Defence	Advanced Physiologic Monitoring at the Site of Spinal Cord Injury	\$567,000
Mark Cembrowski	V Hirsch-Reinshagen , N Yachie, M Fatehi, G Redekop, J Maguire	2023 - 2025	New Frontiers in Research Fund	The cell-type-specific basis of epilepsy and treatment in the living human brain	\$125,000

A. Lukey	G. Hanley, D. Huntsman , M. Woo, G. Stuart, A. Leonova, K. Rufin, J. Zhang	2023 - 2024	4th Annual Gynecologic Cancer Initiative Trainee Research Day	Canadian Institutes of Health Planning and Dissemination Grant - Institute Community Support	\$10,000
Mel Krajden	Linda Hoang, Catherine Hogan, Agatha Jassem , James Johnston, Muhammad Morshed, Natalie Prystajewsky , Inna Sekirov , Mayank Singal, Danuta Skowronski	2023 - 2027	CFI Biosciences Research Infrastructure Fund	BOLSTER-3-Pathogen Research: Building Operational Laboratory Strength to enhance Risk 3 pathogen research	\$4,148,345
Michael Irvine, Mathieu Maheu-Giroux, Sharmistha Mishra, Hind Sbihi	G. Cadieux, O. Gatalo, A. Jassem , M. Kwag, A. Nikiforuk, R. Shahin, L. Wang, J. Cox, M. Gilbert, M. Klein, N. Lachowsky, S. Patel, M. Singal, F. Xiu, A. Dumont Blais, J. Grennan, J. Knight, C. Mangat, N. Prystajewsky, D. Tan, A. Zygmunt, J. Flores, J. Hopkins, N. Knox, C. Navarro, B. Sander, C. Wagner	2023 - 2025	CIHR - Mpox (monkeypox) and zoonotic threats	Optimizing Mpox surveillance strategies and preventing epidemic resurgence: a three-province mathematical modelling study	\$500,000
Sarah Henderson	Agatha Jassem , Hind Sbihi	2023 - 2024	BC Lung Association - Lung Health Research Grants Competition	Biomass smoke exposure and COVID-19: Advancing the evidence with a novel test-negative case-crossover design	\$50,000
L. Evgin	S. Gorski, R. Holt, G. Morin, M. Sadar, I. Tai, A. Karsan	2023 - 2024	BC Cancer Foundation (Innovation support fund)	Spectramax Id3 plate reader	\$1,987,890
Withers SG	Kizhakkedathu J	2023 - 2025	Health Research BC	Automatic Washing Protocols for the Development of Universal Blood	150 000
J. Pizzorno	G. Krystal , N. McKinney, & S. Yanick	2023 - Present	Lopker Family Foundation	Testing natural compounds for their ability to reverse cancer cell-induced upregulation of Glycolysis	\$107,060
Keown, P	Lan, J , Liwski, R, Sherwood, K , Sapir-Pichhadze, R, Bryan, S, Paraskevas, S, Wagner, E, Gill, J, Ferre, E, Lun, E	2023 - 2027	Genome Canada: Genomics Applications Partnership Program	A National prospective epitope-compatibility matching program for Canadian renal transplant patients	\$5,823,737
Leonard Foster	Honglin Luo (Co-lead), Gabriela Cohen Freue, Brett Finlay, Michael Gold, Eric Jan, Christopher Overall, Sheila Teves, Stuart Turvey	2023 - Present	Canada Foundation for Innovation	Transformative and Disruptive Systems Immunology	\$7,140,211

Myers R, Hung R	MacAulay C , Rajapakshe R, Liu G, Campbell K, Tammemagi M, McInnis M, Meza R, Martel S, Lam S, Peacock S, Leipsic J, Shaipanch T	2023 - 2028	CCS - Breakthrough Team Grant	Improving Detection of Early Lung Cancer in a diverse population (IDEAL)	\$5,400,000
Yvonne Bombard	Dr. J. Carroll Dr. J. Lerner-Ellis Dr. T. Nelson Dr. J. Richer Dr. K. Schrader Dr. E. Seto Prof. K. Thorpe	2023 - Present	CIHR	The Genetics Update: Designing and evaluating a patient platform to deliver updated genomic results	\$170,000
Robin Urquhart	Wan Lam is a co-applicant	2023 - 2028	Canadian Cancer Society - Breakthrough Grant	Changing the narrative of lung cancer to improve prevention for non-smokers	\$5,197,879
Ramon Klein Geltink (BCCHR/UBC)	Francis Lynn (BCCHR/UBC), Yongjin Park (BCCRC/UBC), Kevin Bennewith (BCCRC/UBC)	2023 - Present	CIHR	Glucose restriction-mediated metabolic adaptation as a driver of CD8+ T cell function	\$1,240,000
Samuel Aparicio	Yongjin Park	2023 - Present	CIHR	Decoding the impact of single cell mutational processes in TNBC/HGSOC	\$1,450,000
Kelly L. Brown, PhD, Assistant Professor, Dept. of Pediatrics, Faculty of Medicine, The University of BC	Drs. Cherry Mammen (BCCH), Dr. David Cabral (BCCH), Kim Morshita (BCCH), Maziar Riazzy	2023 - Present	CHIR	Evaluating the utility of adult-defined prognostic biomarkers: Are they appropriate in childhood onset primary chronic vasculitis?	\$290,700
S Lippman (PI)	M Rosin , D Laronde (Vancouver Site Leads)	2023 - 2026	NIH/NCI	CP-CTNet M4OC-Prevent: Metformin for oral cancer prevention. Continuation of Trial.	\$199,553 USD
Sam Aparicio	Cescon, Andrew Roth	2023 - 2028	Canadian Institutes of Health Research	Decoding the impact of single cell mutational processes on the drug fitness landscape of genomically unstable cancers Your Role: Co-applicant	\$1,450,000
Darrel Tan, Rosemary Audu, Robert Kozak	Shannon Russell , Natalie Prystajecky , Agatha Jassem , John Tyson, James Zlosnik, Inna Sekirov	2023 - 2025	CIHR	Canada-Africa Monkeypox Partnership (CAMP): Characterizing transmission dynamics and evaluating medical countermeasures to inform the clinical and public health response to MPX	\$3,000,000

S. Gallinger	J. Knox, D. Renouf, G. Zogopoulos, DF. Schaeffer (co-applicant)	2023 - 2028	Canadian Cancer Society (CCS)	Casper-PANC: Canadian strategy for personalized management of pancreatic cancer	\$7,500,000
Mel Krajden	Linda Hoang, Catherine Hogan, Agatha Jassem, James Johnston, Muhammad Morshed, Natalie Prystajecy, Mayank Singal, Danuta Skowronski, Inna Sekirov - Co-Applicant	2023 - 2027	CFI Biosciences Research Infrastructure Fund	BOLSTER-3-Pathogen Research: Building Operational Laboratory Strength To Enhance Risk 3 Pathogen Research	\$4,148,345
Eric McGinnis	Stubbins R, Spence T, Sherwood K , Hamadeh Z, Shopsowitz K, Yip S	2023 - 2024	UBC Precision Health Catalyst Grant 2023	Rapid targeted gene sequencing and high- resolution optical genome mapping to optimize selection of targeted therapies in acute myeloid leukemia	\$50,000
James Lan	John Gill, Michael Mengel, Sherwood K , et al.	2023 - 2023	Canadian Institute of Health Research (CIHR)	A Randomized, Multicenter Canadian Trial to Evaluate the Clinical Utility of Donor-Derived Cell Free DNA Testing for Renal Allograft Injury	\$945
James Lan	West L, Halpin A, Liwski R, Gunaratham L, Gangji A, Bissonette ML, Sherwood K , Keown P	2023 - 2025	CDTRP â€œCanadian Donation and Transplantation Research Programme â€œInnovation Grant Competition 2023	Accelerating the Translation of a Novel Luminex Anti-ABO Antibody Detection Technology to Expand the Use of ABO-incompatible Transplantation in Canada	\$30,000
John Gill	James Lan, Rita Suri, Sherwood K et al.	2023 - 2023	Canadian Institute of Health Research (CIHR)	A prospective interventional study to prevent allosensitization in patients who have failed a first kidney transplant	\$705,000
Kirk Schultz	Karen Sherwood, Gregor Reid, Chinten Lim, Ramon Klein Geltink, Paul Schaeffer, Poul Sorensen, Kevin Hay	2023 - 2028	Michael Cuccione Foundation	Shaping the Future of immune Therapies - CAR-T	\$10.5 Million
Paul Keown	Liwski, R, Sherwood, K , Lan, J, Sapir-Pichhadze, R, Bryan, S, Paraskevas, S, Wagner, E, Gill, J, Ferre, E, Lun, E	2023 - 2023	Genome Canada	A National prospective epitope-compatibility matching program for Canadian renal transplant patients	\$5,591,000
Tom Blydt-Hansen	Wishart D, Eibensteiner F, Cohen G, Sherwood K, Wang L, Bissonnette ML	2023 - 2025	National Kidney Foundation of Canada	Multiomic characterization of chronic, active T cell- mediated rejection in pediatric kidney transplant recipients	\$120,000
S Aparcio	P Sorensen, A Sweet-Cordero, A Roth	2023 - 2025	United States Department of Defense	Decoding and targeting genomic instability in pediatric osteosarcoma	USD\$ 440,000
R. Kridel	C. Steidl	2023 - 2025	Leukemia and Lymphoma Society of Canada	Stromal cell interactions in Hodgkin lymphoma	\$200,000

Mohamed Ali Bedaiwy	Savitha Balachandran, Sabina Dobrer, KS Joseph, Sarka Lisonkova, Jefferson Terry , Paul Yong	2023-2024	CIHR Catalyst Grant	Prediction of Pregnancy Outcomes Using Point-of-Care First Trimester Biomarkers in a Recurrent Pregnancy Loss Population	\$111,386
N. Bradley	Turley, Elona	2023 - Present	Kaye Fund Competition, UHF	Northern Alberta Viscoelastic-Informed Guidance in Acute Trauma: Evaluation (NAVIGATE)	\$104,491
Julie MacFarlane	Hilary Vallance	2023	BC Ministry of Health Innovation Pathway Program	First tier Non-Invasive Prenatal Screening	\$50,000
L. Rideout	B. Verchere , D. Luciani, J. Johnson, P. Thompson (Manitoba)	2023 - 2028	CIHR-JDRF Team Grants: Precision Medicine in Type 1 Diabetes	Leveraging biological sex and genetics for beta cell-directed precision medicine in type 1 diabetes	\$750,000
Russ Algar	Xiaoxiao Li, Gang Wang	2023 - 2025	Government of Canada	Cell-Based Medical Diagnostic Testing on a Smartphone for Low-Resource Communities	\$250,000
Anna McGuire	Stephen Yip , Stephen Lam, Janice Leung, Renelle Myers, Will Lockwood	2023 - 2024	Lung Cancer Canada	A Pilot Study on the Relationship between Genomic Alterations, Exposure to Air Pollution and Accelerated Lung Age in Never-Smokers with Lung Cancer	\$50,000
Gelareh Zadeh	Federico Gaiti, Sheila Mansouri (Collaborator - Stephen Yip)	2023 - 2028	Canadian Cancer Society	Establishing a non-invasive approach to accurately diagnose and assess brain tumours	\$4,515,770
Intan Schrader, Steve Jones, Peter Lansdorp	Stephen Yip (Co-applicant)	2023 - 2026	Genome Canada	Genomic Applications Partnership Program: "Parentâ€™ofâ€™Originâ€™Aware genomic analysis"	\$2,000,000
Jennifer Chan & Marshall Pitz	Stephen Yip , Namita Sinha, Sidney Croul, Adrienne Weeks, Jeremy Roy	2023 - 2026	The Terry Fox Research Institute	The Pan-Canadian Lower-grade Glioma (MOH-PCLG) project: Enabling biomarker-driven treatment options for relapsed IDH-mutant gliomas	\$897,000
Michael Underhill	Stephen Yip , Lesley Hill, Kelly McNagny	2023 - 2028	CIHR	Fate and function of MPs within the MB tumour microenvironment (Project grant â€™ CPT)	\$1,100,000
Raphael Charest-Morin	Stephen Yip , Nicolas Dea, Chetan Bettegowda	2023 - 2025	New Frontiers in Research Fund (Government of Canada)	Personalized medicine for primary bone tumors of the spine	\$248,810

REFEREED PUBLICATIONS 2023

Source: Faculty Activity Database (FAD)

Agoumi, Mehdi	Metastatic neuroendocrine tumor masquerading as orbital cysticercosis. Wirth MA, Khan HM, Sabiq F, Agoumi M, Neufeld A. <i>Neuroradiol J.</i> 2023 Apr;36(2):229-231. doi: 10.1177/19714009221124305. Epub 2022 Aug 31. PMID: 36044662 Free PMC article.
Al Rawahi, Ghada	Gadkar VJ, Goldfarb DM, Al-Rawahi GN, Srigley JA, Smailus DE, Coope RJN, Pleasance S, Watson N, Chen T, Lam S, Hoang L, Tilley PAG. Extraction-free clinical detection of SARS-CoV-2 virus from saline gargle samples using Hamilton STARlet liquid handler. <i>Sci Rep.</i> 2023 Mar 14;13(1):4241. doi: 10.1038/s41598-023-30993-2. PMID: 36918604; PMCID: PMC10013237.
Aparicio, Samuel	Lee E, Chern K, Nissen M, Wang X; IMAXT Consortium; Huang C, Gandhi AK, Bouchard-Côté A, Weng AP, Roth A. SpatialSort: a Bayesian model for clustering and cell population annotation of spatial proteomics data. <i>Bioinformatics.</i> 2023 Jun 30;39(39 Suppl 1):i131-i139. doi: 10.1093/bioinformatics/btad242. PMID: 37387130; PMCID: PMC10311307.
Aparicio, Samuel	Ceglia N, Sethna Z, Freeman S, Uhlitz F, Bojilova V, Rusk N, Burman B, Chow A, Salehi S, Kabeer F, Aparicio S, Greenbaum B, Shah S & McPherson A. Identification of transcriptional programs using dense vector representations defined by mutual information with GeneVector. <i>Nat Commun.</i> 2023 July 20; 14, 4400 (2023). https://doi.org/10.1038/s41467-023-39985-2
Aparicio, Samuel	Nguyen HL, Geukens T, Maetens M, Aparicio S, Bassez A, Borg A, Brock J, Broeks A, Caldas C, Cardoso F, De Schepper M, Delorenzi M, Drukker CA, Glas AM, Green AR, Isnaldi E, Eyfjörð J, Khout H, Knappskog S, Krishnamurthy S, Lakhani SR, Langerod A, Martens JWM, McCart Reed AE, Murphy L, Naulaerts S, Nik-Zainal S, Nevelsteen I, Neven P, Piccart M, Poncet C, Punie K, Purdie C, Rakha EA, Richardson A, Rutgers E, Vincent-Salomon A, Simpson PT, Schmidt MK, Sotiriou C, Span PN, Tan KTB, Thompson A, Tommasi S, Van Baelen K, Van de Vijver M, Van Laere S, Van't Veer L, Viale G, Viari A, Vos H, Witteveen AT, Wildiers H, Floris G, Garg AD, Smeets A, Lambrechts D, Biganzoli E, Richard F, Desmedt C. Obesity-associated changes in molecular biology of primary breast cancer. <i>Nat Commun.</i> 2023 Jul 21;14(1):4418. doi: 10.1038/s41467-023-39996-z. PMID: 37479706; PMCID: PMC10361985.
Aparicio, Samuel	Cui Y, Yang G, Goodwin D, O’Flanagan C, Sinha A, Zhang C, Kitko K, Park D, Aparicio S, IMAXT Consortium, Boyden E; Expansion microscopy using a single anchor molecule for high-yield multiplexed imaging of proteins and RNAs. <i>PLOS ONE</i> 18(9): e0291506. 2023 September 23. https://doi.org/10.1371/journal.pone.0291506
Aparicio, Samuel	Zhang H, Delaidelli A, Javed S, Turgu B, Morrison T, Hughes C, Yang X, Pachva M, Lizardo M, Singh G, Hoffman J, Huang Y, Patel K, Shraim R, Kung S, Morin G, Aparicio S, Martinez D, Maris D, Bosse K, Williams K, Sorensen P; A MYCN-independent mechanism mediating secretome reprogramming and metastasis in MYCN-amplified neuroblastoma. <i>Sci. Adv.</i> 9:eadg6693(2023). 2023, August 23. DOI:10.1126/sciadv.adg6693
Aparicio, Samuel	Cannell IG, Sawicka K, Pearsall I, Wild SA, Deighton L, Pearsall SM, Lerda G, Joud F, Khan S, Bruna A, Simpson KL, Mulvey CM, Nugent F, Qosaj F, Bressan D; CRUK IMAXT Grand Challenge Team; Dive C, Caldas C, Hannon GJ. FOXC2 promotes vasculogenic mimicry and resistance to anti-angiogenic therapy. <i>Cell Rep.</i> 2023 Aug 29;42(8):112791. doi: 10.1016/j.celrep.2023.112791. Epub 2023 Jul 26. PMID: 37499655.
Aparicio, Samuel	Takemon Y, LeBlanc VG, Song J, Chan SY, Lee SD, Trinh DL, Ahmad ST, Brothers WR, Corbett RD, Gagliardi A, Moradian A, Cairncross JG, Yip S, Aparicio SAJR, Chan JA, Hughes CS, Morin GB, Gorski SM, Chittaranjan S, Marra MA. Multi-Omic Analysis of CIC's Functional Networks Reveals Novel Interaction Partners and a Potential Role in Mitotic Fidelity. <i>Cancers (Basel).</i> 2023 May 17;15(10):2805. doi: 10.3390/cancers15102805. PMID: 37345142; PMCID: PMC10216487.
Aparicio, Samuel	Jun SH, Toosi H, Mold J, Engblom C, Chen X, O'Flanagan C, Hagemann-Jensen M, Sandberg R, Aparicio S, Hartman J, Roth A, Lagergren J. Reconstructing clonal tree for phylo-phenotypic characterization of cancer using single-cell transcriptomics. <i>Nat Commun.</i> 2023 Feb 22;14(1):982. doi: 10.1038/s41467-023-36202-y. PMID: 36813776; PMCID: PMC9946941.
Aparicio, Samuel	Zaikova E, Cheng B, Cerda V, Kong E, Lai D, Lum A, Bates C, den Brok W, Kono T, Bourque S, Chan A, Feng X, Fenton D, Gurjal A, Levasseur N, Lohrisch C, Roberts S, Shenkier T, Simmons C, Taylor S, Villa D, Miller R, Aguirre-Hernandez R, Aparicio S, Gelmon K; Detection of circulating plasma tumour mutations in early stage triple negative breast cancer as an adjunct to pathological complete response assessment. <i>medRxiv</i> 2023.05.31.23290797; 2023, June 4. doi: https://doi.org/10.1101/2023.05.31.23290797
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