Department of
PATHOLOGY

DALHOUSIE UNIVERSITY

2024 Annual Report

Expanding Our Impact and Horizons

MESSAGE FROM THE DEPARTMENT HEAD

Expanding our impact and horizons

In 2024, the Department of Pathology marked substantial progress in our efforts to re-develop our infrastructure to meet the requirements of the future. We are looking 30 to 50 years ahead, gauging the needs of a population that is growing larger, older and more diverse. At the same time, we are mindful that medical testing is advancing rapidly, requiring flexibility and foresight in our efforts to plan for the future.

In the here and now, I am pleased to report that the MacKenzie Building's seventh floor ventilation system is being renovated. This will dramatically improve air quality and will allow this building to remain in commission for many more years. In the shorter term, we are strategically relocating the MacKenzie Building laboratories that perform urgent tests required for inpatient care to the new building being constructed at the Halifax Infirmary site on Robie Street. This move will improve the speed and efficiency of this vitally important testing.

We have expanded our blood collection capacity at Dartmouth General Hospital by enlarging blood collection areas and extending hours of operation to include weekends. The newly implemented drive-through blood collection service is proving to be very popular with patients and an efficient means of collecting samples. Through these efforts at Dartmouth General and other sites, we have increased blood collection appointments in the Central Zone by nearly 20 per cent this year.

We continued to work with colleagues across Nova Scotia to prepare for the 2025 launch of the One Person One Record medical record system. We have done a lot of groundwork to ensure the smooth integration of this new system with the equipment in our laboratories, so test results can be uploaded straight into patients' medical records. We are excited to see this project come to life, as it will streamline test-ordering processes and aid collaborative care in the province.

In another large-scale collaborative effort, we are developing a system for evaluating, training and licensing international medical lab technology graduates who want to come and work in Canada. This will help us solve our ongoing human resources shortage in this specialized field.

Our faculty members are very involved in preparations for the opening of Dalhousie Medicine Cape Breton later this year. They are working with pathologists at the Cape Breton Regional Hospital to review the undergraduate curriculum to ensure medical students at the new campus receive the same learning experience as their counterparts in Halifax and Saint John. The addition of Cape Breton to our teaching sites will open up another community rotation opportunity for residents as well. Community rotations are a very important aspect of residency training, as you will see inside this report.

In terms of advanced specialty programs, we are introducing a graduate program (MSc/PhD) in Human Genetics and Genomics, as well as a clinical training program in Genetics and Genomic Diagnostics. These training programs will support the ongoing success of the new IWK Maritime Centre for Precision Medicine, featured in this report.

I would like to extend my sincere gratitude to Dr. Graham Dellaire for his many years of outstanding service as our research director. His determination and resourcefulness most recently allowed us to establish the HistoCORE facility. At the same time, I am delighted to welcome Dr. Shashi Gujar into the role of research director. You will learn more about his international vision for research later in this report. I look forward to seeing our global collaborations expand under his remarkable leadership.

It is bittersweet to bid farewell to Dr. Joanne Murphy and Dr. David Haldane. Both are retiring after decades of service to the department. We are grateful for their many contributions and wish them well as they embark on this next stage of their lives.

Finally, I am delighted to welcome Dr. Richard Wood to the Division of Hematopathology, Dr. Elizabeth Sims to the Division of Microbiology and Dr. Sean Rasmussen and Dr. Nicole Delaney to the Division of Anatomical Pathology. Dr. Delaney has joined us from Alberta, while the rest of the new faculty members are graduates of our own residency programs. It is gratifying to see how they have grown during their time with us and to watch them flourish in their new faculty positions.

I am looking forward to our continued progress in 2025. I am always impressed by the willingness, ingenuity and capability of our faculty, staff and learners, as they embrace new challenges and opportunities with enthusiasm and skill.

Dr. Irene Sadek
Head, Department of Pathology

CLINICAL WORKLOAD

17,754,909 TESTS

1,356,188 BLOOD COLLECTIONS

PEOPLE

116 PRIMARY FACULTY
13 CROSS APPOINTED FACULTY
6 ADJUNCT FACULTY

752 NSHA TECHNICAL STAFF
148 IWK TECHNICAL STAFF
236 NEW BRUNSWICK TECHNICAL STAFF

RESIDENTS

35 RESIDENTS & FELLOWS

14 DIAGNOSTIC & MOLECULAR
9 DIAGNOSTIC & CLINICAL
7 HEMATO-PATHOLOGY
5 MEDICAL MICROBIOLOGY

GRADUATE STUDENTS

37 GRADUATE STUDENTS & POSTDOCTORAL FELLOWS

15 MSc
12 PhD
10 PDF

RESEARCH STATISTICS

242 PUBLICATIONS

$9,023,362 GRANT CAPTURE

Dr. Ola Kajetanowicz and her mentor, Dr. Meghana Toal, in Saint John

EDUCATION FEATURE

Pathology residents gain **confidence and independence** through community rotations

RESIDENTS IN THE DEPARTMENT OF PATHOLOGY periodically pack up their bags and head to a hospital outside Halifax for a new learning experience. In so doing, they gain insight into the diverse nature of community pathology practice, expanded opportunities for self-directed learning and inspiration about where they want to work and how they want to practice when their residency is finished.

"Dalhousie Medical School has a mandate from the Nova Scotia government to increase learning opportunities outside HRM, for both medical students AND residents," says Dr. Erica Schollenberg, program director for residency training in Diagnostic and Molecular Pathology (previously known as Anatomical Pathology). "Every resident is required to complete at least ten per cent of their training blocks in other Maritime centres, amounting to roughly seven months of their residency."

Doing four-to-eight week rotations at smaller hospitals in Truro, Moncton, Saint John, Fredericton, Charlottetown—and soon, in Sydney, Cape Breton—shows residents a new view of pathology practice that is not available to them working in a tertiary centre like the QEII Health Sciences Centre.

"In community practice, residents see cases where people have not presented with symptoms previously anywhere else, so they are the ones to make the initial diagnosis," notes Dr. Cheng Wang, program director for resident training in Diagnostic and Clinical Pathology (formerly known as General Pathology). "In tertiary centres, patients have already been worked up and diagnosed, and now pathologists and residents are looking to refine the diagnosis. It's a very different perspective and set of skills required."

As a senior resident in Diagnostic and Molecular Pathology, Dr. Ola Kajetanowicz has completed three community rotations: in Truro, N.S., in second year; in Charlottetown, P.E.I. in third year; and in Saint John, N.B., in fifth year.

"It has been a great way to consolidate my learning in my final year," says Dr. Kajetanowicz of her recent experience in Saint John. "You see such a wide breadth and variety of cases come across your desk in a community setting, compared to the more specialized and sub-specialized workloads you see in Halifax, and you get to work really independently when you're a senior resident. It's been an incredible review of all my learning to date and has really helped boost my confidence heading into final exams and my future role as a staff pathologist."

"You see such a wide breadth and variety of cases come across your desk in a community setting, compared to the more specialized and sub-specialized workloads you see in Halifax."

DR. OLA KAJETANOWICZ

Her community rotations have been such positive experiences for her during her residency training, Dr. Kajetanowicz is moving forward with plans to work in a community setting in Nova Scotia after she graduates.

"I feel really well prepared to enter community practice and I know I will enjoy it," she says. "I'm glad I've had so many opportunities to see what it's like to work as a pathologist at a smaller centre."

According to Dr. Meghana Toal, a staff pathologist at the Saint John Regional Hospital and assistant professor in the Department of Pathology, having residents coming from Halifax on rotation helps keep her and her colleagues in Saint John up to date with the latest developments in the fast-evolving world of pathology.

Diagnostic and Molecular Pathology resident, Dr. Ola Kajetanowicz

Dr. Yu Chen and Marilyn Garcia, who work with residents in Fredericton

"It's very much a two-way street," says Dr. Toal, who supervises about three residents a year. "The residents are learning how we conduct our investigations here, while we are picking up all of the updates from them."

As a Dalhousie graduate herself, who also did rotations around the Maritimes during her residency, Dr. Toal says that having residents do community rotations strengthens ties among pathologists across the region, fostering collegiality and collaboration.

"Pathologists in Halifax who did community rotations understand how our practice is different in smaller centres in terms of equipment and the kinds of cases we see, and of course we understand how the system works in Halifax because we trained there too," explains Dr. Toal. "And more of us know each other personally, having worked together on rotation, which makes it much easier to pick up the phone to consult on a challenging case."

Dr. Alexandra Pettit and medical lab technologist Lauren Emms in Fredericton

Community rotations offer residents a breadth of experience and degree of independence that is hard to come by in a larger centre. This is partly because there is less specialization, and also because there are fewer learners on site at any given time.

"We only have one learner at a time in Fredericton," notes Dr. Alexandra Pettit, a Dal graduate who is now a staff pathologist at the Everett Chalmers Hospital and assistant professor in the Department of Pathology. "As a result, that learner has access to a wide array of learning opportunities and can tailor their experience precisely to fill in the gaps in their EPAs, the entrustable professional activities they must master as they progress through their training."

Residents on rotation in Fredericton have unique access to all of the pathologists and lab staff at the hospital, and opportunities to gross patient tissues (study them with the naked eye), examine cancer cells from all tumour sites under the microscope, and perform autopsies/prepare the report of findings for the coroner, who determines the manner of death. This differs from Nova Scotia, where a medical examiner conducts the autopsy and determines both the cause and manner of death.

Dr. Derek Minney is another Dalhousie pathology graduate who found his professional home in a smaller town after doing a rotation in Truro during his residency. "Doing a rural placement in Truro helped me get the job here after I graduated," he says. "Team dynamics and personality fit are that much more important in a smaller centre. After working here on rotation, the team knew me and I knew them, which gave me confidence that I would like it here."

Dr. Heidi Paulin, P.E.I. Pathology & Laboratory Medicine

Residents in Truro gain exposure to both a high volume and wide variety of cases. "We examine everything but brain tissues here," Dr. Minney notes. "We see some very unusual cases as well, and get to work through our caseload on our own schedule. It's a very flexible style of practice here, which is great when you have a family."

> *"It is important to stay humble and be involved in training the next generation of pathologists. There is a growing need for pathologists in the region and it is a privilege to be part of building that capacity."*
>
> **DR. HEIDI PAULIN**

The Queen Elizabeth Hospital in P.E.I. hosts one or two pathology residents a year, who have the opportunity to work closely with a team of seven pathologists, a hematopathologist, medical microbiologist and two clinical chemists, utilizing a recently installed suite of new equipment.

"We cover the entire island and work very closely with our clinical colleagues in surgery, obstetrics and gynecology, cardiology and other specialties," says Dr. Heidi Paulin, a Dalhousie graduate and head of Pathology and Laboratory Medicine for P.E.I. "Residents are exposed to a wide range of cases, including a lot of cancers and forensic cases. We see interesting and unusual things every day."

For Dr. Paulin, supervising residents is not only stimulating for her and her colleagues: it's a way to give back. "The opportunity to train residents is exciting for us," she says. "It is important to stay humble and be involved in training the next generation of pathologists. There is a growing need for pathologists in the region and it is a privilege to be part of building that capacity."

For their part, residents are grateful to have such a dedicated group of teaching faculty in the distributed learning centres. "Our residents consistently report excellent learning experiences in community settings," says Dr. Cheng Wang. "They benefit tremendously from these rotations, which ultimately translate to better care for people all across the Maritimes."

Dr. Jo-Ann Brock, Lee Anne Boutilier and Dr. Victor Martinez

CLINICAL FEATURE

Precision medicine takes centre stage at IWK Health

IN AN ERA WHEN NEW TECHNOLOGIES AND TREATMENTS ARE EMERGING EVERY DAY, IWK Health is making sure health care in the Maritimes stays ahead of the leading edge by embracing precision medicine.

In 2024, IWK Health put forward a proposal to the Nova Scotia Department of Health and Wellness to fund a new IWK Maritime Centre for Precision Medicine, as its key transformation initiative for the year. The government responded to this compelling proposal by providing the funds for the human resources, equipment and facility development required to launch such a paradigm-shifting initiative.

“Drug therapies are increasingly being developed to target specific genetic changes,” explains Lee Anne Boutilier, director of the IWK Maritime Centre for Precision Medicine. “But unless you have the analytical capabilities to find these genetic variations in your patients, you cannot provide the treatments. This initiative provides us with a forward-facing strategy that will empower us to offer new, targeted treatments as they become available.”

The new precision medicine centre builds upon years of effort to expand genetic testing and analytical capacities at IWK Health, led by Dr. Jo-Ann Brock, chief of the Division of Pathology and Laboratory Medicine and a professor in Dalhousie Medical School’s Department of Pathology.

“Thanks to Genome Canada’s ‘All for One’ initiative and many local funders, we have built significant whole-genome and whole-exome sequencing capabilities in the IWK’s Clinical Genomics Lab over the past few years,” says Dr. Brock. “This puts us in a strong position to build on this foundation in order to provide increasingly effective customized treatment options for our patients in the future.”

Lee Anne Boutilier, Dr. Jo-Ann Brock and Dr. Victor Martinez

Even though this effort is based at the IWK, it is not for children and women only. Rather, it is providing precision medicine services to people of all ages and sexes across the Maritimes.

“Medical genetics and inherited diseases have been managed at the family level at the IWK for years,” notes Dr. Brock. “So this genomics-based work dovetails well with our established expertise in these related areas.”

Precision medicine offers better treatment results, with fewer-to-no toxic side effects, compared to traditional “one-size-fits-all” medicine. This is a particularly powerful advantage in the realm of cancer treatment, and applies also to eye diseases, heart problems, inflammatory and autoimmune diseases and many other inherited conditions—including those that will now be identifiable with newborn testing, with life-saving results for infants and important implications for their families.

“We are developing truly data-driven health care,” says Dr. Victor Martinez, a clinical genomics specialist and assistant professor in the Department of Pathology who leads data analytics for precision medicine at the IWK. “This work allows us to connect the dots between patient clinical history, the results of standard medical tests and genomic testing and analysis. When these dots are connected, we can match each patient with the treatments most likely to succeed based on their unique genetic profile.”

> *“This work allows us to connect the dots between patient clinical history, the results of standard medical tests and genomic testing and analysis. When these dots are connected, we can match each patient with the treatments most likely to succeed based on their unique genetic profile.”*
>
> **DR. VICTOR MARTINEZ**

Since funding began in June, the new centre has hired genome analysts, clinical laboratory associates, medical laboratory technologists and a variety of other roles, to support the rapidly growing and changing service. Some of the funds were used to purchase a high-throughput genomic sequencing system, the Illumina NovaSeqXPlus, and some will be used to conduct feasibility studies and potential designs for a new physical location for the IWK Maritime Centre for Precision Medicine as this area of medicine grows in importance and impact.

Dr. Brock, Dr. Martinez and Ms. Boutilier are ensuring smooth and timely access to precision medicine by facilitating educational activities for physicians in a wide range of specialties about specific genetic testing and treatment algorithms and how to apply these to patient care to get the best results.

"In addition to 'mainstreaming' genetic testing to physicians who are not medical geneticists, we are providing them with access to genetic counsellors if they have any questions about ordering tests, reporting results, and next steps," says Ms. Boutlilier. "We have already piloted these processes with cardiologists and are preparing to roll them out to other subspecialties."

Beyond clinical care, the new IWK Maritime Centre for Precision Medicine is preparing to offer fellowship training in the areas of genetics and genome diagnostics. Drs. Brock and Martinez are also involved in nationwide research collaborations, sharing data with their counterparts across Canada to speed up the rate of discovery and the application of new discoveries to patient care.

There are even commercial implications to this new initiative. "We are building collaborations locally with Dalhousie spin-off companies focused on developing AI applications for health care," explains Dr. Martinez. "AI tools are essential for analyzing millions, even billions, of genomic data points, and connecting them to the rest of the patient's data in ways that yield meaningful results. Custom-designing these tools in collaboration with local spin-off companies is a win-win-win for the Maritimes."

As the technology develops, Dr. Martinez predicts that in the near future, it will even be possible to test potential treatments in "digital patients": essentially, computer models of individual patients that will let doctors know precisely how effective a particular treatment is likely to be and whether or not it will be toxic to that patient.

"It's very exciting to see how our past efforts have paved the way to this important new capability," says Dr. Brock. "From here we will continue to build our capacity to deliver precision medicine to patients across the Maritimes."

Teresa McMillen, Dr. B.S. Unnikrishnan and Anurag Banerjee

RESEARCH FEATURE

Exponential potential: global cancer research collaborations **lead the way to cures**

FOR DECADES, SCIENTISTS AND DOCTORS HAVE AVOIDED THE WORD "CURE" in their discussions of cancer treatments, knowing "remission" was all they could promise. But now, says Dr. Shashi Gujar, a cancer researcher and professor in the Department of Pathology, they are beginning to whisper the word with real hope in their hearts.

"Cancer immunotherapies introduced within the last two decades are proving so successful in eradicating cancer for the long-term, that we can now consider the possibility of real cures for many patients, even for such previously deadly cancers as melanoma," says Dr. Gujar. "The main issue we are working on now is making these treatments more effective for older patients."

As Dr. Gujar explains, the Achilles' heel of cancer immunotherapy is that immune function declines with age, leading to an increased incidence of cancer in the elderly. Older people represent by far the largest proportion of the cancer patient population, yet their immune systems are less responsive to therapies designed to stimulate their immunity.

Dr. Gujar and his colleagues around the world are determined to bridge this gap by finding ways to rejuvenate the immune function of older people, so they can benefit more from this new generation of cancer therapies.

"There is so much complexity and so many areas of expertise required to address the many multi-faceted questions; there is no way we will ever get all the answers from one lab," he says. "That is why we are working with colleagues all across Canada and in India, Japan, Taiwan, South Korea, the United Kingdom, France, Germany, Denmark and the United States. As we learned through COVID, when you bring people together to share all of their knowledge, advances happen quickly."

Since establishing his lab at Dalhousie Medical School in 2016, Dr. Gujar has assembled a global network of investigators and labs, all working together on this effort. A big part of the collaboration involves PhD and postdoctoral trainees, who connect with labs in other countries to learn from the locals and share their expertise.

"We have trained more than 60 learners in my lab so far, many of them from India," says Dr. Gujar, citing DUCI3, Dalhousie University's Cancer Immunotherapy Initiative in India, which involves 16 research institutes and biotech companies across India in a concerted effort to train the world's next generation of cancer researchers and bring forth proven and patentable innovations in cancer immunotherapy.

"Dr. Gujar's research in cancer immunotherapy, particularly in rejuvenating immune function in older patients, aligns perfectly with my interests and goals in the field of oncology," says Dr. Vishnu Vijay Vijayan, one of Dr. Gujar's postdoctoral fellows from India. "The collaborative nature of the lab, with its global network of researchers, promises a dynamic environment where I can learn cutting-edge techniques and contribute meaningfully to the science of cancer treatment."

> *"It speaks to the scientific excellence of Dalhousie's cancer research that we are able to play a leadership role in a global collaboration of this magnitude."*
>
> **DR. SHASHI GUJAR**

Trainees have the benefit of travelling to other labs within the collaboration to gain specific skills, expand their horizons, and perhaps find a permanent faculty position upon completion of their training.

Dr. B.S. Unnikrishnan (PDF, India), Anurag Banerjee (MSc candidate, India), Dr. Shashi Gujar (PI, Canada), Teresa McMillen (PhD candidate, USA), Ibrahim Ahmed (Bioinformatician, Sudan)

"It speaks to the scientific excellence of Dalhousie's cancer research that we are able to play a leadership role in a global collaboration of this magnitude," notes Dr. Gujar. "And it speaks to the quality of our trainees that they are now working in labs at Stanford and Harvard and in India, as well as biotech companies across Canada."

Major investments from the Canadian government, in combination with extensive local contributions, have primed Dalhousie for its key role in global cancer immunotherapy research.

"We are now home to cutting-edge facilities in the areas of genomics, proteomics, metabolomics and immunometabolomics," Dr. Gujar explains. "This is allowing us to map what is happening in the aging immune system at the molecular level, so we can identify targets for therapy."

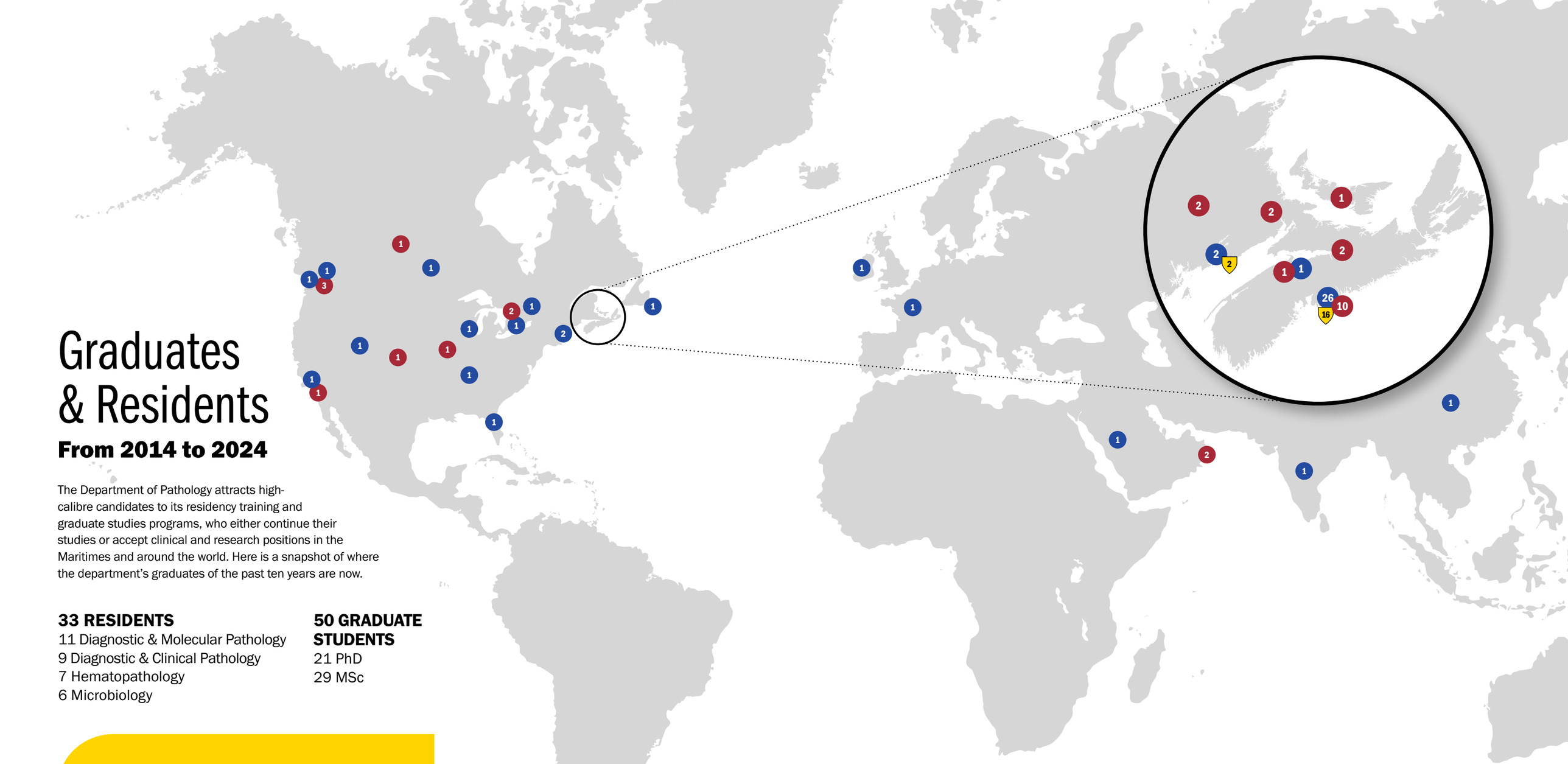
Dr. Gujar and his team are collaborating with Japan's Dr. Tasuku Honjo who, along with Dr. James Allison, won the Nobel Prize in 2018 for their discovery of checkpoint inhibitors. These are proteins that put the brakes on the immune response, thereby allowing cancers to proliferate. This discovery paved the way for cancer immunotherapies that work by disabling these brakes, allowing the immune system to detect and eliminate cancer cells.

"These immunotherapies are being used against almost all kinds of cancer now," Dr. Gujar says. "While they are extremely successful for many cancers, such as breast, lung, skin and gastrointestinal cancers, they are not effective against all cancers and they are not as effective for people over the age of 60."

He and his team are working hard to find agents that could make the treatments more effective for more cancers, especially for older people and people with compromised immune systems. They have found that strategic supplementation offers great promise for rejuvenating immune function and are testing several nutrients and formulations to see which ones work the best in which conditions.

"We are now in the era of precision, personalized medicine," says Dr. Gujar, noting that his work dovetails with other work underway in the Department of Pathology and Faculty of Medicine to advance the technology required to analyze massive amounts of molecular data about individual patients. "Ultimately, we will be able to target treatment not just for the type of cancer, but for the genetic and metabolic profile of the patient, as well as their blood type, age and other factors affecting treatment outcomes."

With large global teams working on this initiative together, sharing their knowledge and resources, progress in this direction is rapid. "The potential of our collaboration is exponential," Dr. Gujar says. "We are determined to solve the problem of cancer for all of humankind."



Graduates & Residents

From 2014 to 2024

The Department of Pathology attracts high-calibre candidates to its residency training and graduate studies programs, who either continue their studies or accept clinical and research positions in the Maritimes and around the world. Here is a snapshot of where the department's graduates of the past ten years are now.

33 RESIDENTS
11 Diagnostic & Molecular Pathology
9 Diagnostic & Clinical Pathology
7 Hematopathology
6 Microbiology

50 GRADUATE STUDENTS
21 PhD
29 MSc

Where are they now?

- **Resident** now working as a pathologist
- **Grad student** now working or continuing studies
- *continuing studies at Dalhousie*

Other Stats

18 GRAD STUDENTS CONTINUING STUDIES AT DALHOUSIE
9 MD program (7 in Halifax, 2 in Saint John)
3 Residency training
6 PhD or PDF

14 EMPLOYED IN ACADEMIC, HEALTH CARE AND GOVERNMENT INSTITUTIONS

7 EMPLOYED IN INDUSTRY

DALHOUSIE UNIVERSITY

Department of Pathology
DIVISION REPORTS

Anatomical Pathology

Clinical Focus in 2024

In 2024, the Division of Anatomical Pathology concentrated on improving the turnaround time for surgical pathology specimens, and addressing the annual increase in both in-house and consultation cases. To manage this growth, the division hired two new pathologists, and actively filled locum positions to maintain service quality.

The division expanded its digital pathology capabilities by signing a contract with CaloPix®, an advanced image-management system. This partnership enabled the initiation of limited digital pathology sign-outs, streamlining workflow and improving diagnostic efficiency.

Significant improvements were made in the immunohistochemistry lab, with increased biomarker coverage enhancing diagnostic precision. Additionally, long-awaited repairs to the ventilation system in the Anatomical Pathology Lab commenced, necessitating the temporary relocation of the gross room to the first-floor morgue in December.

Education Advancements

The division welcomed its first gastrointestinal/liver fellow, Dr. Cornelia Thoeni, under the guidance of fellowship director, Dr. Ashley Stueck. In terms of leadership transitions, Dr. Erica Schollenberg stepped into the role of director of the Diagnostic and Molecular Pathology program, taking over from Dr. Gillian Bethune.

Responsibilities of PGY5 transition-to-practice residents were expanded, involving them in supervising autopsy training for PGY1 and PGY2 residents and organizing in-house examinations. As part of Dalhousie Medical School's curriculum renewal, Drs. Rasmussen, Pasternak, Geldenhuys, Croul, Bullock and Arnason reviewed and updated pathology content in multiple first and second-year medical tutorials.

Several division members, including Drs. Castonguay, Sapp, Stueck, Barnes and Dakin Hache, contributed as speakers at the annual Canadian Association of Pathologists-Association Canadienne Pathology Resident Review Course, sharing their expertise with the broader pathology community.

Research Developments

Dr. Gillian Bethune assumed the role of Biobank director, succeeding Dr. Sidney Croul. The Biobank now has nearly 3,000 consenting patients, who have contributed samples from various organs and systems, and continues to receive funding from the Terry Fox Research Institute.

Under the leadership of Dr. Zhaolin Xu, the QEII Lung Tumour Bank has grown to 8,000 cases, making it the largest lung tumour bank in Canada. Dr. Xu's current research focuses on liquid biopsy and whole-genome sequencing, with multiple funded projects and recent publications advancing the field.

Additional Highlights of 2024

Dr. Mike Carter chaired the organizing committee for the inaugural Atlantic Precision Medicine Conference, held in Halifax in November 2024, fostering collaboration and knowledge exchange in the field.

Dr. Ashley Stueck served as president of the International Liver Pathology Study Group, hosting a meeting in Halifax in September focused on inherited and genetic liver diseases in adults. This meeting attracted pathologists from around the world.

Awards and Recognition

- Dr. Mathieu Castonguay received the Resident's Choice Teaching Award for the second time, recognizing his exceptional contributions to resident education.
- Dr. Cheng Wang, head of the Cytopathology section and director of the Diagnostic and Clinical Pathology Program, was honoured with the David T. Janigan Teaching Award, acknowledging his significant impact on pathology education.

Microbiology

Clinical Focus of 2024

In 2024, the Division of Microbiology conducted 830,658 tests. The laboratory has seen an increase in specimens in most sections, resulting in a 25 per cent increase in laboratory volumes compared to pre-COVID years. The division implemented machine learning to enhance its total laboratory automation system, maximizing the benefits of automation to address ongoing human resource challenges and increase test volumes. Notably, it introduced machine learning auto-release for negative urine and throat-culture specimens, becoming the first laboratory worldwide to adopt this process, which division members presented at international conferences. This success has also improved the turnaround time for these specimens. As the division catches up with recruitment and training, remodeling specimen-processing procedures will further maximize the benefits of this automation.

The division also implemented molecular detection of bacterial pathogens in stool samples, reducing turnaround times and further streamlining bacteriology operations in the face of human resource challenges.

With support from the Nova Scotia Department of Health and Wellness, the division expanded its pathogen genome-sequencing activities beyond SARS-CoV-2 to include influenza viruses and invasive group A streptococcus. It secured funding to further extend sequencing to bacterial causes of gastroenteritis, supporting national outbreak investigations through PulseNet.

Education Advancements

The Division of Microbiology continues to play a vital role in teaching at all levels, from undergraduate to graduate programs at Dalhousie University, and in training the next generation of medical laboratory technologists and laboratory assistants.

Research Developments

Division of Microbiology members continue to lead productive research programs, in collaboration with colleagues across Canada and around the world. They advanced their explorations of diverse topics, ranging from emerging infections and tick-borne infections to antimicrobial resistance and stewardship.

Division members published 16 studies in such esteemed peer-reviewed journals as *Canadian Pharmacists Journal*, *PLOS One*, *Scientific Reports, Microbiology Spectrum* and *Gastroenterology* in 2024. These included comprehensive studies of infectious diseases such as Lyme disease, varicella, influenza, respiratory syncytial virus (RSV) and Clostridioides difficile (C. difficile), providing valuable insights into their epidemiology, screening, diagnosis and prevention. Notably, the division explored the effects of pharmacist prescriptive authority on Lyme disease prophylaxis, assessed population immunity to varicella in Canada, and evaluated clinical outcomes of influenza and RSV co-infections. Additionally, they investigated the safety and efficacy of microbiome therapeutics in preventing recurrent C. difficile infections. These studies underscore the division's commitment to advancing microbiology research and mitigating the impact of infectious diseases on public health.

Additional Highlights of 2024

At the end of December, Dr. David Haldane retired from the Department of Pathology, after more than 38 years of clinical service. Dr. Haldane is an outstanding microbiologist who has made many important contributions to the Division of Microbiology, the Division of Infectious Diseases and public health in Nova Scotia and beyond. He has been instrumental in molding the careers of division members and microbiologists across the country. While bidding a fond farewell to Dr. Haldane, the division enthusiastically welcomed Dr. Elizabeth Simms, who completed her residency training with the division in 2024.

Awards and Recognition

» Dr. Ross Davidson received the Faculty of Medicine Award of Excellence in Teaching (PhD Faculty), in recognition of his dedication to mentoring and teaching learners at all levels. Dr.Davidson's profound impact on medical education at Dalhousie reflects his commitment to excellence and student success.

Clinical Chemistry

Clinical Focus of 2024

In 2024, the Division of Clinical Chemistry prioritized enhancing the quality and efficiency of analytical and clinical services by strengthening collaborations with clinical teams, particularly in gastroenterology, hematology and nephrology. These partnerships led to several advancements. The division launched a FIB-4 scoring pilot to facilitate the early identification of patients at risk for liver cirrhosis, thereby improving proactive care in at-risk populations. They optimized inflammatory bowel disease management by streamlining patient pathways through the appropriate use of fecal calprotectin testing. The division explored targeted approaches to address iron deficiency anemia in perioperative patients, aiming to improve preoperative readiness and outcomes. They enhanced the clinical utility and reporting of key multiple myeloma diagnostic tests, including serum protein electrophoresis, immunofixation electrophoresis and serum free light chains. Additionally, the division facilitated broader access to innovative tests, such as cystatin-C and sIL2R to improve diagnostic accuracy and patient outcomes.

Education Advancements

The Division of Clinical Chemistry maintained a strong focus on both didactic and clinical teaching in 2024, continuing to support the development of future professionals, including residents in general pathology and endocrinology. They also hosted three observers exploring careers in clinical chemistry and facilitated electives for six medical students (Med 1 through Med 4) as part of their pathology rotations. Division members mentored two summer students on research projects (outlined below), enriching their clinical and investigative skills. The division's Biochemical Investigations of Clinical Disease (BIOC4813/PATH5013) course ran successfully in the fall of 2024, offering synchronous lectures and regular assignments over 12 weeks.

Division members also provided 48 hours of tutorials for second-year medical students during the Metabolism II course, ensuring robust foundational knowledge in biochemistry and metabolism.

Research Developments

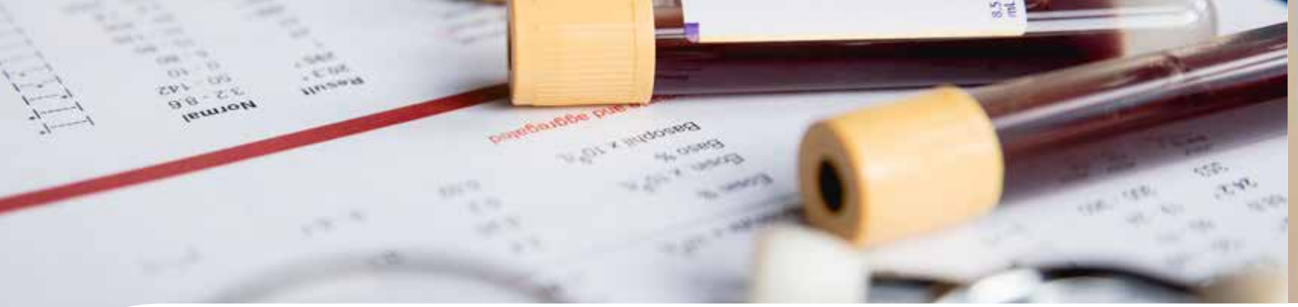
The Clinical Chemistry team marked several notable achievements in 2024, reflecting its commitment to impactful research and collaborative innovation. For example:

Streamlining referral approvals: Early in the year, members published an article showcasing the success of a new vetting process for external referral requests. This approach not only reduces costs but ensures resources are allocated effectively.

Advancing hereditary hemochromatosis (HH) management: In late 2024, members published a second article introducing an algorithm to guide appropriate genetic testing for hereditary hemochromatosis (HH). This tool aims to improve patient management while minimizing unnecessary testing. A summer student played a key role in this study.

Proteomic insights in multiple myeloma: Another summer student contributed to a novel proteomic analysis of multiple myeloma patients using the department's biobank. This study identified key proteins linked to outcomes and received a prestigious abstract award at the 2024 American Society of Hematology (ASH) Annual Conference. A publication is forthcoming.

National collaboration on hepatic porphyria: Members of the Clinical Chemistry team co-authored the Canadian Guidelines for the Diagnosis and Management of Acute Hepatic Porphyria through national collaborations.



Hematopathology

Clinical Focus of 2024

In 2024, the Division of Hematopathology made significant strides in modernizing various tests and laboratory services. Notably, the division's blood transfusion service focused on leveraging automation to enhance testing efficiency. This included the successful validation and implementation of automated red cell antibody testing and automated blood group testing for all red blood cell units transfused within the Central Zone. These innovations have not only dramatically improved turnaround times but have also increased throughput and significantly reduced testing costs.

Education Advancements

2024 was a milestone year for the Hematopathology residency training program. The program welcomed two new residents, Dr. Laura Rodriguez and Dr. Christopher Liwski, who began their training in July 2024. In addition, the division was successful in securing funding approval for a CaRMS match position for the 2025-26 academic year.

Division members celebrated the success of two fellows, Dr. Richard Wood and Dr. Shatha Altahan, who completed their training in the division's inaugural Hematopathology Fellowship Training Program, established in 2023 in partnership with the Dalhousie University Postgraduate Medical Education office. The division also proudly welcomed Dr. Noof Mathkor as a fellow in its HLA Director Fellowship Training Program, which is accredited by the American Society for Histocompatibility and Immunogenetics.

Research Developments

On the research and quality improvement front, the division successfully developed a novel flow cytometry-based multiplexed assay to measure levels of antibodies against ABO blood group antigens. This innovative method is not only more accurate and efficient but also requires only a fraction of the reagents and sera needed for conventional ABO blood group antibody tests, which are widely used in blood banks worldwide. The goal is to implement this assay nationally to identify candidates who can safely undergo ABO-incompatible kidney transplantation.

The HLA laboratory introduced a new serum treatment protocol to enhance HLA antibody detection. This quality improvement initiative was published in *Human Immunology*, the official journal of the American Society for Histocompatibility and Immunogenetics, and was ranked among the top three most-accessed studies by the journal's readership.

Awards and Recognition

» Dr. David Conrad received the Department of Pathology Excellence in Clinical Service Award and the Division of Hematopathology Dr. Bruce Wright Teaching Award.

Foundational Science

Education Advancements

In 2024, there were 21 graduate students at various stages in the Department of Pathology's graduate program. Four of these students successfully completed their program's required defenses for graduation. The high calibre of these students is reflected by the fact that over 60 per cent of them held a stipend and award. Pathology graduate students have a track record of being highly competitive for awards, which also speaks to the quality of the graduate program itself.

Research Developments

Collaborative cutting-edge research within the department has hosted productive and inclusive partnerships with clinicians, basic scientists and community members—especially patients and their advocates. This multidisciplinary approach to research has enabled impactful studies that have successfully attracted multi-year, multi-million-dollar funding support, and resulted in multiple publications in recognized scientific journals. This research has also been highlighted across an array of media platforms. Indeed, these positive developments form the foundation of innovative research which ultimately aims to promote better health for everyone.

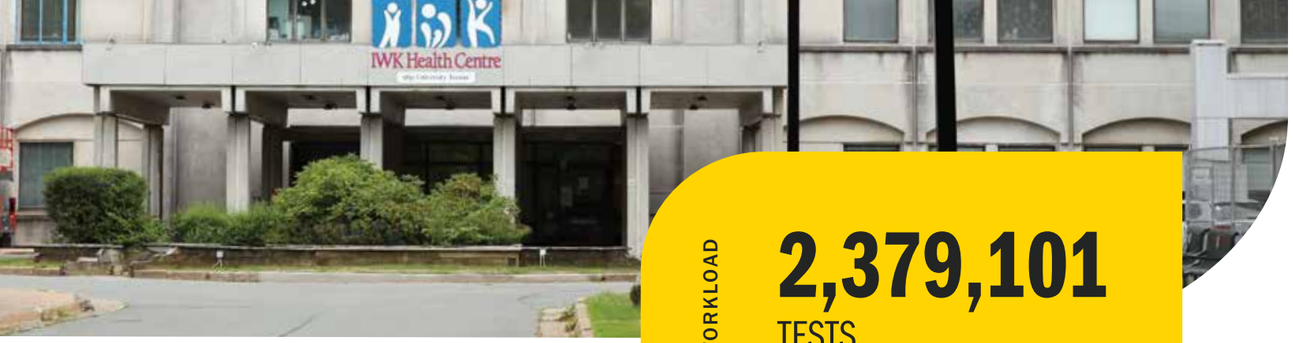
Additional Highlights of 2024

A number of researchers in the Department of Pathology received notable funding awards. These include: Dr. Paola Marcato's five-year $1.2 million CIHR project grant; Dr. Graham Dellaire's $1.2 million CIHR project grant with Dr. Brent Johnston; Dr. Jeanette Boudreau's $2.4 million Terry Fox Foundation project grant with a national team; and, Dr. Shashi Gujar's $40.2 million Canada Biomedical Research Fund and Biosciences Research Infrastructure Fund (CBRF-BRIF) grant in collaboration with Dr. Susan Howlett at Dalhousie University and a team at the University of British Columbia.

Awards and Recognition

» Dr. Graham Dellaire received the 2024 Dalhousie Faculty of Medicine Award for Excellence in Basic Research.

» Dr. Jeanette Boudreau was appointed scientific director of the Beatrice Hunter Cancer Research Institute (BHCRI).



IWK CLINICAL WORKLOAD

2,379,101
TESTS

216,495
BLOOD COLLECTIONS

IWK Pathology & Laboratory Medicine

Clinical Focus of 2024

CLINICAL GENOMICS

Clinical Genomics acquired a cutting-edge NovaSeq X Plus instrument, a next-generation DNA/RNA sequencer (NGS) that permits significantly higher throughput for NGS testing and allows the division to offer advanced forms of genetic testing. A second automated extractor, and two new liquid handling robots for automated library preparation, will increase the volume and throughput capacity for NGS testing. Additional personnel, supported through the new IWK Maritime Centre for Precision Medicine, has enabled development of a data team to support implementation projects, software design and variant analysis for NGS and clinical exome analysis.

HEMATOPATHOLOGY

The Division of Hematopathology collaborated hospital-wide to update procedures and improve laboratory testing. In early 2024, the transfusion medicine team changed its manipulation practices, decreasing the turnaround time required to provide aliquoted blood to neonates. The team also worked with the pediatric OR team to streamline pre-operative lab testing in patients undergoing cardiac surgeries, optimizing delivery of blood components to the OR.

Hematology also worked with the NICU team to acquire and validate microtubes for coagulation testing for NICU and pediatric OR patients. These patients require the smallest collection volumes, and microtubes enable staff to perform coagulation testing using 50 per cent less blood than previously validated tubes, marking a critical improvement for these patient populations.

The team also submitted an SBAR (Situation-Background-Assessment-Recommendation) to change their malaria-screening platform, which will improve testing and turnaround times. In addition, members worked diligently on One Person One Record (OPOR) in preparation for launch in 2025.

BIOCHEMISTRY

The Biochemistry team installed and verified new chemistry analyzers. At the same time, the team established and implemented new reference intervals, quality assurance tools, and new tests to the platform. Newborn Screening (NBS) went live with the first of two new mass spectrometers and two more conditions were added to the NBS panel: Spinal Muscular Atrophy and Tyrosinemia Type 1.

ANATOMICAL PATHOLOGY

In 2024, the Division of Anatomical Pathology experienced a 25 per cent increase in surgical pathology case volumes over 2023, attributed to improved surgical access at IWK Health. Despite this rise, the division maintained excellent turnaround times for surgical and autopsy pathology reports, particularly focusing on cancer cases, with most diagnoses rendered within one week of biopsy. To enhance specimen tracking, the team implemented a system for monitoring samples from the Women's Program operating rooms and clinics. Additionally, the team acquired and validated a new Leica Spectra automated stainer and coverslipper, which streamlines slide processing and ensures consistent staining quality. The division also prioritized staff safety by introducing new occupational exposure testing, procuring equipment to reduce volatile chemical exposure and improving ergonomics in technical workspaces.

MICROBIOLOGY

As respiratory illnesses continue to circulate, the Microbiology team has focused on ensuring sufficient testing capacity for potential increases in Group A Streptococcus, Mycoplasma pneumoniae and Bordetella pertussis infections. To enhance agility in respiratory testing, the division acquired a DiaSorin Simplexa system. The team completed in-house validation of Interferon-Gamma Release Assay (IGRA) testing using the QuantiFERON-TB Gold Plus method. Team members continued to address evolving population needs and the appropriate use of available resources, including plans to validate calprotectin testing on DiaSorin LIAISON XL analyzers and explore the expansion of Molecular Microbiology to encompass pathogens such as malaria.

Education Advancements

CLINICAL GENOMICS

Dr. Karen Bedard spearheaded the development and implementation of a multidisciplinary "mainstreaming" education curriculum to enhance clinicians' knowledge and understanding of genetic testing applications, thus improving patient access to genetic testing. The first iteration, launched in April 2024 for a group of cardiologists, focused on integrating genetic insights into cardiovascular care. The program is expanding to include provider access to inherited cancer predisposition, aiming to equip health-care professionals with the expertise to identify and manage patients at risk for hereditary cancers.

HEMATOPATHOLOGY

The Hematopathology Division supported two transfusion medicine technologists to attend the Canadian Society for Transfusion Medicine (CSTM) conference in Saskatoon. In addition, many technologists were able to take part in two separate CSTM virtual conferences and the Nova Scotia Blood Coordinating Team's Blood Matters conference in November.

Dr. David Conrad conducted several "lunch and learn" sessions, covering such topics as bone marrow transplantation and newborn screening for hemoglobinopathies.

The transfusion team participated in a mock trauma team activation and MTP (Massive Transfusion Protocol) with the emergency department to ensure there are no gaps in procedures and to give new technologists valuable practical experience outside of an actual emergency situation.

BIOCHEMISTRY

The Division of Biochemistry leveraged conference opportunities for staff development, including the Garrod Symposium in Ottawa, the Canadian Association of Genetic Counselling Annual Education Conference in Quebec City, the Association of Public Health Laboratories Newborn Screening Symposium in Omaha, Nebraska, LABCON in St. John's and the Newborn Screening World View Summit in Turku, Finland.

In December, the Royal College of Physicians and Surgeons of Canada appointed Dr. Zaiping Liu as the Region 5 voting member representative on the Specialty Committee in Diagnostic and Clinical Pathology. This committee advises the Royal College on specialty-specific content issues related to standard-setting, credentials, assessment and accreditation.

ANATOMICAL PATHOLOGY

The Division of Anatomical Pathology continued to host trainees at all levels, including students in medical lab assistant and medical lab technologist programs at the Nova Scotia Community College (NSCC), Michener and other colleges, as well as medical students, pathology residents and off-service residents.

Dr. Erica Schollenberg stepped into the program director role for the Department of Pathology's Diagnostic and Molecular Pathology residency program.

MICROBIOLOGY

The Division of Microbiology provided ongoing multidisciplinary training with NSCC, Michener and Dalhousie Medical School (medical students and residents).

Research Developments

Collectively, IWK Department of Pathology & Laboratory Medicine members have been involved with research activities resulting in six peer-reviewed scientific publications and four presentations at scientific meetings.

CLINICAL GENOMICS
Dr. Victor Martinez was awarded a Data Transformation Grant this year through the Canadian Cancer Society to develop a new platform for collating and translating data from children with cancer in the Maritimes. This will make the data easier to access, resulting in better care and outcomes.

Dr. Martinez is supervising a master's student, Melis Erkan, who is examining the use of next-generation sequencing technologies in the diagnosis of repeat expansion disorders.

This work is being supported by the IWK Foundation's Translating Research into Care Healthcare Improvement Research Fund.

HEMATOPATHOLOGY
The Hematopathology team collaborated with the Canadian Obstetrical and Pediatric Transfusion Network (COPTN) on a study examining RhIg dosing in the event of fetal-maternal hemorrhage. This may reduce the number of diagnostic tests required in advance of administering RhIg in these critical situations. The team also participated in a McMaster University study to determine if reverse ABO grouping is an appropriate surrogate for isohemagglutinin titres in transplant patients. The division contributed pediatric blood samples to a study seeking to validate a point-of-care CBC analyzer developed by Dr. Alan Fine, Dalhousie professor and CEO of Alentic Microscience. In addition, division members worked with the Canadian Obstetrical and Pediatric Transfusion Network (COPTN) on the panel and final manuscript review for the "Consensus Statement for Transfusion Testing and Prevention of Anti-D Alloimmunization." Publication is expected in 2025.

BIOCHEMISTRY
Corey Filiaggi presented a case report from newborn screening for a rare disorder (LCHADD) at Pathology Research Day in April 2024, and received the award for best external platform presentation.

Additional Highlights of 2024

HEMATOPATHOLOGY
Hematopathology increased its complement of senior technologist positions (MLTII and temporary MLTIII) to promote the laboratory's stability and ability to complete validations, research projects and quality work within the division. The division has been aligning with provincial processes to maintain consistency and prepare for the new provincial hospital information system.

The IWK Foundation committed more than $500,000 to The Cellfie Project, which will be used to develop new digital teaching assets for pediatric leukemia patients. The Cellfie Project has expanded in scope to welcome patients with needle phobias, solid tumours and sickle cell disease to visit the lab.

BIOCHEMISTRY
Biochemistry introduced a temporary MLTIII position to oversee all chemistry areas, creating stability and strengthening work done in the division. It also expanded the utilization of medical laboratory assistants in the division, improving service efficiency and enhancing job satisfaction.

ANATOMICAL PATHOLOGY
The Division of Anatomical Pathology prepared for the transition to the One Person One Record system, scheduled for August 2025. This will be the first pathology lab to embrace the new system, a major change in workflow to improve efficiency. The division submitted a new business case to the Department of Health and Wellness to upgrade aging laboratory space.

Awards and Recognition

- Dr. Victor Martinez received an IWK Leadership Grant from the IWK Medical, Dental, Scientific & Affiliated Staff (MDSAS) to attend a conference, Artificial Intelligence and Data Science for Leaders.
- Dr. Heleen Arts received the David T. Janigan Teaching Award.
- Dr. Jo-Ann Brock and Lee Anne Boutilier received an IWK Board Award of Leadership.
- Dr. David Conrad was named a diplomate of the Royal College of Physicians and Surgeons of Canada in Transfusion Medicine.
- Transfusion Medicine received a redesignation for Using Blood Wisely in June 2024 for two years post initial designation.
- Dr. Robert Fraser received the Dalhousie Department of Pathology Lifetime Achievement Award.

New Brunswick

NB CLINICAL WORKLOAD

4,000,000
TESTS

197,073
BLOOD COLLECTIONS

Clinical Focus in 2024

The pathology laboratory continues to provide services at the Saint John Regional Hospital, the largest hospital in the province with a wide catchment area in southwestern New Brunswick. A full-service facility, the lab is home to well-equipped pathology, cytology, molecular pathology, hematopathology, transfusion medicine, clinical chemistry, stem cell and medical microbiology sections. The lab provides a wide range of services that support many local and provincial programs and busy clinical departments.

In 2024, the pathology lab made significant progress toward solidifying gains in molecular pathology. Staff successfully introduced a cutting-edge technology known as Optical Genome Mapping (OGM) for molecular profiling of tumours. OGM is poised to go live in March 2025.

Education Advancements

In addition to hosting senior pathology residents, who are capable and qualified to experience a greater degree of autonomy, the lab accepted residents in their early years of residency training in 2024. In addition to hosting residents at all phases of their training, the lab continued its involvement in undergraduate medical education and participated in wet lab teaching.

Additional Highlights of 2024

The Division of Anatomical Pathology made significant workflow changes, which allowed a substantial reduction in the amount of paper used in day-to-day practice. Digitizing patient requisitions and introducing a slide-and-block archiving system, funded by the Saint John Hospital Foundation, has allowed the lab to further improve its archiving capacity and ability to keep track of valuable diagnostic materials.

Dr. Jennifer Shea, president-elect of the Canadian Society of Clinical Chemists, is beginning her tenure as president of the society in 2025. She aims to build connections and adopt lessons that will ultimately benefit the patients served by the pathology lab.

OUR FACULTY

Dr. Mohamed Abouelhassan
Dr. Behram Cenk Acar
Dr. Tom Arnason
Dr. Heleen Arts
Dr. Penelope Barnes
Dr. Lori Beach
Dr. Karen Bedard
Dr. Gillian Bethune
Dr. Jeanette Boudreau
Dr. Ihssan Bouhtiauy
Dr. Robert Boutilier
Dr. Matthew Bowes
Dr. Jo-Ann Brock
Dr. Martin Bullock
Dr. Hakan Buyukdere
Dr. Michael Carter
Dr. Mathieu Castonguay
Dr. Yu Chen
Dr. Cal Cheng
Dr. David Conrad
Dr. Sidney Croul
Dr. Lisandra Cubero Herrera
Dr. Kelly Dakin Hache
Dr. Ross Davidson
Dr. Ian Davis
Dr. Ryan DeCoste
Dr. Nicole Delaney
Dr. Graham Dellaire
Dr. Xiaofeng Ding
Dr. Tsetan Dolkar
Dr. Alexander Easton
Dr. Mojgan Ebrahimi
Dr. Allison Edgecombe
Dr. Sameh El Bailey
Dr. Manal Elnenaei
Dr. Somayyeh Fahiminiya
Dr. Greg Fairn
Dr. Jennifer Fesser
Dr. Ronald Francis
Dr. Robert Fraser
Dr. Daniel Gaston
Dr. Laurette Geldenhuys
Dr. Tanya Gillan
Dr. Marek Godlewski
Dr. Peter Green
Dr. Anna Greenshields
Dr. Wenda Greer
Dr. Jennette Gruchy
Dr. Shashi Gujar
Dr. David Haldane
Dr. Todd Hatchette
Dr. David Hoskin
Dr. Yossry Hussein
Dr. Thomas Issekutz
Dr. Doha Itani
Dr. Farhan Khan
Dr. Dae Tong Kim
Dr. Jason LeBlanc
Dr. Patrick Lee
Dr. Zaiping Liu
Dr. Robert Liwski
Dr. Amy Lou
Dr. Thai Ly
Dr. John Alexander MacNeil
Dr. Erin MacQuarrie
Dr. Emmanuel Maicas
Dr. Timothy Mailman
Dr. Samina Mansoor
Dr. Paola Marcato
Dr. Victor Martinez
Dr. Kathryn McFadden
Dr. Kristen Mead
Dr. Craig Midgen
Dr. Erik Mont
Dr. Phillip Moss
Dr. Shawn Murray
Dr. Ather Naseemuddin
Dr. Bassam Nassar
Dr. Jennifer O'Neill Merrimen
Dr. Tish O'Reilly
Dr. Ken Obenson
Dr. Saul Offman
Dr. Sylvia Pasternak
Dr. Glenn Patriquin
Dr. Alexandra Pettit
Dr. Jason Quinn
Dr. Mahboubeh Rahmani
Dr. Tarek Rahmeh
Dr. Lakshmi Rajappannair
Dr. Muhammad Rasul
Dr. Pouya Sadeghi Aval
Dr. Irene Sadek
Dr. Heidi Sapp
Dr. Erica Schollenberg
Dr. Sorin Selegean
Dr. Sundip Shah
Dr. Allam Shawwa
Dr. Jennifer Shea
Dr. Yu Shi
Dr. Elizabeth Simms
Dr. Navaro Spartaco
Dr. Ashley Stueck
Dr. Ismatun Swati
Dr. Andrea Thoni
Dr. Meghana Toal
Dr. Imran Umar
Dr. Michael Volodarsky
Dr. David Waisman
Dr. Noreen Walsh
Dr. Cheng Wang
Dr. Ian Wanless
Dr. Marnie Wood
Dr. Richard Wood
Dr. Zhaolin Xu
Dr. Jake Yorke

OUR RESIDENTS AND FELLOWS

Diagnostic & Molecular Pathology
Dr. Alexandra Eaton
Dr. Mariam El-Serafi
Dr. Karama Asleh
Dr. Caroline Guinard
Dr. Angela Cheng
Dr. Rumana Rafiq
Dr. Carley Bekkers
Dr. John Loggie
Dr. Aleksandra (Ola) Kajetanowicz
Dr. Allison Maybank
Dr. Alexandre Corriveau
Dr. Archana Kakadeker
Dr. Zuzanna Gorski
Dr. Cornelia Thoeni

Diagnostic & Clinical Pathology
Dr. Michael Ilves
Dr. Simon Farquharson
Dr. Lauren Wotton
Dr. Alexander Rudiuk
Dr. Mahtab Khudadad
Dr. Nafisa Shandi
Dr. Ibrahim Elsharawi
Dr. Eniko Hollo
Dr. Ashlyn Fong

Hematological Pathology
Dr. Amarilis Figueiredo
Dr. Laura Rodriguez Torres
Dr. Christopher Liwski
Dr. Shatha Altahan
Dr. Richard Wood
Dr. Sultan Altulihi
Dr. Manal Al Aufi

Medical Microbiology
Dr. Elizabeth Simms
Dr. Yahya Shabi
Dr. Mohammed AlQahtani
Dr. Thamir AlSaeed
Dr. Reema Alabdulqader

OUR POSTDOCTORAL FELLOWS

Dr. Raj Pranp Arun
Dr. Unnikrishnen Babukutta
Dr. Shima Borzouie
Dr. Dharmapal Burne
Dr. Sandhya Chipurupa
Dr. Charneal Dixon
Dr. Preethi Nair
Dr. Perryn Kruth
Dr. Michael Salsaa
Dr. Vishnu Vijayan
Dr. Marie-Claire Wasson

OUR ACADEMIC & RESEARCH STAFF

Dr. Dharini Bharadwaj
Janis Breeze
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Kimberlea Clarke
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Nigel Griffiths
Karla Hernandez de Goldsmith
Dr. Barry Kennedy
Kelly Leights
Dr. Geetha Marivel
Victor Martins Madeira
Tomoko Ochi
Sripriya Panjalingam
Dr. Gopal Pathak
Dr. Jayme Salsman
Michelle Sampson
Dr. Rashmi Shah
Dr. Jaganathan Venkatesh
Dr. Haggag Zein
Dandan Zhao

OUR GRADUATE STUDENTS

MSc
Arezoo Afshari
Yara Azizieh
Anurag Banerjee
Lara Crone
Alex Gibson
Bakhmala Khan
Maya MacLean
Noah Martin
Meghan McLean
Anna Nicolela
Mika (Sieun) Park
Jayatee Ray
David Sapp
Kennedy Whelan
Freyja Vert

PhD
Riley Arseneau
Hannah Cahill
Mark Hanes
Vishnu PriyanKumar
Edwin Leong
Teresa McMillen
Gillian Okura
Morgan Pugh-Toole
Sabateeshan Mathavarjah
Leah MacLean
Olivia Walker
Lauren Westhaver

ANNUAL DEPARTMENT AWARD WINNERS

DR. WENDA GREER PRIZE FOR RESEARCH EXCELLENCE
Dr. Marie Claire Wasson

GRADUATE STUDENT AWARD FOR TEACHING, OUTREACH & MENTORING
Dr. Jayme Salsman

POSTDOCTORAL FELLOW TRAVEL AWARD
Dr. Marie Claire Wasson

FOM DEPT. OF PATHOLOGY PATH FORWARD COLLABORATION AWARD
Dr. Victor Martinez

BEST PAPER – FUNDAMENTAL
Dr. Sabateeshan Mathavarajah

BEST PAPER – CLINICAL
Dr. Yu Chen

DAVID T JANIGAN TEACHING AWARD
Dr. Heleen Arts
Dr. Cheng Wang

LIFETIME ACHIEVEMENT AWARD
Dr. Robert Fraser

AWARD FOR EXCELLENCE IN CLINICAL SERVICE
Dr. Manal Elnenaei

RESEARCH DAY WINNERS

BEST TALK BY A PATHOLOGY GRADUATE STUDENT
Hannah Cahill

BEST POSTER BY A PATHOLOGY GRADUATE STUDENT
Alex Gibson

BEST POSTER BY AN EXTERNAL PARTICIPANT
Dr. Marie Claire Wasson

GUPTA TRAVEL AWARD
Dr. Rumana Rafiq
Dr. Ibrahim Elsharawi

BEST TALK BY A PATHOLOGY RESIDENT
Dr. Carley Bekkers

BEST POSTER BY A PATHOLOGY RESIDENT
Dr. John Loggie

BEST POSTER – JUDGES CHOICE
Olivia Walker

BEST TALK BY AN EXTERNAL PARTICIPANT
Corey Filiaggi

RESIDENT TEACHING AWARD
Dr. Rumana Rafiq
Dr. Nafisa Shandi

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