CASE FOR SUPPORT

FOR THE ATLANTIC CANCER RESEARCH INSTITUTE

Fondation CHUDUMONT Foundation

ATLANTIC CANCER RESEARCH INSTITUTE

In the absence of miracles, cancer research becomes our path to hope and science-based solutions.

Cancer waits for no one.

Your support of the Atlantic Cancer Research Institute fuels pioneering studies that are essential to reducing the burden of cancer in Atlantic Canada and beyond by developing new diagnostic tools and therapeutic approaches to improve the lives of cancer patients.

With cancer being the leading cause of death in Canada[1], and cases expected to increase in the coming years[2], our priority is to accelerate cancer research and care.

1- Statistics Canada, 2- Canadian Medical Association Journal

THE ATLANTIC CANCER RESEARCH INSTITUTE

The Atlantic Cancer Research Institute (ACRI) is a private, non-profit organization founded in 1998, affiliated with the Vitalité Health Network, the Université de Moncton, and located on the Dr. Georges-L.-Dumont University Hospital campus in Moncton, New Brunswick.

ACRI researchers collaborate with partners in Canada and around the world to influence patient care by conducting research in the fields of liquid biopsy, genetic sequencing, immuno-oncology, and targeted treatment.

The research team brings together expertise in genomics, proteomics, molecular biology, cell biology, immunology, bioinformatics, pathology, mass spectrometry, as well as in vitro and in vivo testing. Through its research efforts, ACRI contributes to the global effort to combat cancer.

ACRI is dedicated to understanding cancer and finding solutions through interdisciplinary research, applying these new scientific insights to patient care while also contributing to the training of future researchers.

ACRI fosters an environment of interdisciplinary collaboration to promote discovery. Through their efforts, researchers gain a better understanding of cancer cells and the factors that distinguish them from normal cells. This approach allows ACRI scientists to determine which factors are altered in cancer cells to find innovative methods to detect, track, and treat cancer.

Ultimately, knowledge of cancer biology and the application of translational research will allow ACRI's discoveries to benefit cancer care, particularly in early detection, improved diagnostics and prognostics, and better treatment quality.

There is reason to be optimistic. We have made breakthroughs for over 25 years with the support of a passionate community that believes in our ability to transform the cancer experience and offer real hope to patients.

THE ATLANTIC CANCER RESEARCH INSTITUTE AS A BEACON OF HOPE AND INNOVATION

The Atlantic Cancer Research Institute has emerged as a beacon of hope and innovation, driving transformative projects and groundbreaking research in the medical field. With an unwavering commitment to excellence, ACRI has successfully led large-scale organizational projects centred around liquid biopsy and targeted therapy, engaging a diverse array of stakeholders that includes collaborators, funders, and private industry partners.

This collaborative approach has fueled remarkable achievements, including the publication of more that a hundred scientific articles in reputable journals, showcasing the Institute's thought leadership and scientific output.

The growth of ACRI into a dynamic team of over 40 researchers, support staff, and students is a testament to its vibrant research environment. This growth demonstrates the ability to draw researchers to our region while attracting exceptional expertise to build careers here in Moncton. Among its talented team, Dr. Jeremy Roy and Dr. Eric Allain were recently honoured with early investigator awards for their pioneering work in liquid biopsy and bioinformatics, highlighting the Institute's dedication to nurturing the next generation of scientific leaders.

The Institute's innovative spirit is further evidenced by its impressive portfolio of 20 granted and active patents, including three patent families focused on liquid biopsy and therapeutic vehicle-enabling technologies as well as a groundbreaking patent family for a microwave-assisted tumour ablation device and methods.

ACRI's impact extends beyond patents and publications: it has successfully licensed its liquid biopsy technology as a research kit for the scientific community and for a diagnostic company for the development of a multi-cancer early detection kit.

As a proud partner of the New Brunswick Centre for Precision Medicine, ACRI supports patient-centric research within a state-of-the-art 40,000 square foot laboratory space. Additionally, as an operating partner of the CHU Dumont Biobank, the Institute facilitates the collection of biological samples, including liquid biopsies, boasting the largest biobank in the region.

In its quest to conquer cancer, ACRI plays a pivotal role in the Marathon of Hope Cancer Centres Network's Atlantic Cancer Consortium, contributing to next-generation sequencing of tumour samples for all Atlantic provinces and nationwide liquid biopsy projects.

Furthermore, the Institute collaborates with Exactis Innovation, advancing liquid biopsy projects and AI initiatives. With these remarkable accomplishments, ACRI stands at the forefront of medical research, driving innovations that hold the promise of a brighter, healthier future for all.

Dr. Jeremy Roy

RESEARCH IN THE PURSUIT OF IMPROVING PATIENT CARE

At the heart of the Atlantic Cancer Research Institute's mission to find cures and treatments for cancer lies the courage and motivation of those impacted by the disease. Our research at ACRI is driven by core strengths: understanding disease markers by unraveling cancer molecular pathways to uncover therapeutic targets and advancing biomarker discovery and detection.

Identifying cancer cell vulnerabilities demands expertise in targeted therapies, capacity development around the testing of new therapeutic molecules, and finding new therapeutic targets.

ACRI relies on key internal analytical platforms like next-generation sequencing, mass spectrometry, and bioinformatics. Over the 25 years of operation, these techniques have enhanced our ability to discover and detect biomarkers.

As one of Atlantic Canada's pioneering research centres, ACRI houses the Next Generation Sequencing Core at the New Brunswick Centre for Precision Medicine (NBPCM). This facility is making significant strides in genomics, cancer research, and precision medicine.

Our advanced analytical platforms accelerate biomarker discovery and detection. Our liquid biopsy technologies push the possibilities of minimally invasive diagnosis and prognosis.

Further, the same technologies used for isolation of extracellular vesicles (EVs) in liquid biopsies also open the door to using them to capture EVs for use as therapeutic delivery vehicles. We are also leveraging artificial intelligence (AI) to analyze various biomarker types detected with our analytical platforms to enhance diagnostic and therapeutic solutions. Our goal is to offer less invasive methods for cancer detection, treatment monitoring, and managing relapse.

Every day, lives are touched by cancer and it is our duty to pursue research with determination and commitment. Scientific research, innovation, and collaboration will find the answers needed to conquer this disease and minimize the threat of cancer to our loved ones, our families, and our communities.

Dr. Rodney Ouellette

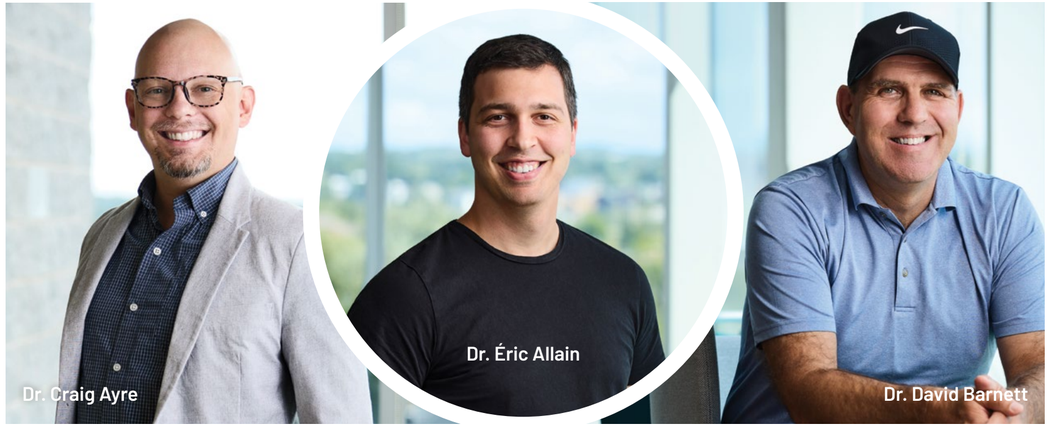
SCIENTIFIC FOCUS AREAS OF ACRI RESEARCHERS

ACRI founder **Dr. Rodney Ouellette**'s focus of research relies on liquid biopsy combined with AI to offer a minimally-invasive and dynamic approach to detecting prostate cancer and predicting responses to immunotherapy in lung cancer patients. Liquid biopsies analyze extracellular vesicles, circulating tumour DNA and other biomarkers present in the blood and other body fluids, providing real-time insights into tumour makeup.

This integration of liquid biopsy and AI enables early detection, monitoring of disease progression, and personalized treatment planning, enhancing patient management and outcomes.

Dr. Jeremy Roy's research also focuses on liquid biopsy and EVs found in biological samples from cancer patients as a promising tool for detecting disease progression in brain cancer patients. As EVs move into the bloodstream by bypassing the blood brain barrier, liquid biopsy can provide a minimally-invasive method to monitor brain tumour dynamics and genetic alterations over time.

The use of advanced technologies and bioinformatics tools in analyzing liquid biopsy data enhances the sensitivity and specificity of detecting disease progression, thereby improving the management and outcomes for brain cancer patients.


Dr. Craig Ayre

Dr. Éric Allain

Dr. David Barnett

Multiparametric bioinformatics and AI are revolutionizing leukemia research by integrating and analyzing vast datasets from various sources, such as genomics, transcriptomics, proteomics, and clinical data.

These advanced computational techniques enable researchers such as **Dr. Éric Allain** to identify complex patterns and correlations that may not be apparent through traditional methods.

AI algorithms can predict disease progression, treatment response, and potential therapeutic targets by processing high-dimensional data and recognizing the subtle biomarkers associated with disease status.

Dr. David Barnett's research sets the stage for enhancing analytical capabilities through innovations in instrumentation in the field of mass spectrometry, leading to the development of capacity for improved biomarker discovery and detection.

SCIENTIFIC FOCUS AREAS OF ACRI RESEARCHERS

The study of targeted therapy for kidney cancer, particularly involving new molecules, is an area of active research undertaken by **Dr. Sandra Turcotte**. It is aimed at improving treatment outcomes and minimizing side effects. Targeted therapies specifically attack cancer cells based on their genetic and molecular profiles, sparing normal cells and reducing collateral damage.

Dr. Gilles Robichaud studies the therapeutic potential of halting the metastasis of breast cancer cells by blocking the cells' energy transfer mechanisms which enable breast cancer cells to spread from the primary tumour to distant organs. This research is vital to the development of new therapies to prevent and treat metastatic breast cancer, which is the leading cause of death in breast cancer patients.

Dr. Stephen Lewis leads a study on the metastatic pathways of breast cancer cells with a focus on understanding how altered production of new proteins allows breast cancer cells to spread from the primary tumour site to distant organs.

He is also interested in understanding how changes in the processes that make new proteins contribute to lung cancer development and progression.

We have identified priorities that will transform our discovery capacity and lead to new solutions to fight cancer.

PRIORITIES

that will transform our capacity for discovery and enable the development of new solutions to combat cancer

RESEARCH CHAIRS AND FELLOWSHIPS TO ATTRACT A NEW GENERATION OF TOP-TIER RESEARCHERS AND SUPPORT OUR EXPERTS ON THEIR JOURNEY OF SCIENTIFIC DISCOVERY.

Major Research Chairs

Major research chairs allow us to attract world renowned experts to develop and lead new research initiatives focused on understanding and treating cancer.

These chairs provide essential leadership support and valuable expertise to stimulate new research projects and collaborations within our research community.

Internal Research Chairs

Internal research chairs are dedicated to fostering the growth of promising researchers within our organization.

They offer the necessary resources and support to cultivate excellence and innovation in cancer research within our ranks.

Support for Young Scientists and Postdoctoral Recruitment

Attracting and retaining top talent is crucial to advancing cancer research.

Our staff support programs offer young scientists the opportunity to pursue their passion for cancer research, providing strong support and mentorship as they embark on their careers.

FUNDS TO FACILITATE KNOWLEDGE TRANSFER

Scientific Retreats and Outreach

We recognize the importance of dedicating time and space to discovery and creativity in cancer research. Scientific retreats, guest speakers, and exchanges with partners offer invaluable opportunities for researchers to explore new ideas, collaborate, and push the boundaries of knowledge in the fight against cancer.

Our ability to send our researchers to prestigious conferences ensures our national and international visibility.

Procedures for Idea Development

Establishing procedures that facilitate idea development is essential to stimulate innovation in cancer research.

By providing support, resources, and mentorship, we enable researchers at all levels to translate their ideas into impactful solutions for cancer prevention, diagnosis, and treatment.

Developing programs that support the dissemination of scientific results is a priority for the Institute.

INNOVATION AND ACCELERATION FUNDS

The creation of unrestricted funds, endowed or expendable, is essential to catalyze innovation and accelerate progress in cancer research. These funds allow us to invest in high-risk, high-impact projects, and the purchase of next generation equipment. They will support research and provide seed funding for innovative ideas that have the potential to attract additional research funds from external sources.

Philanthropy as Leverage and Catalyst to Attract Other Funding Sources

By leveraging opportunities such as funds from ResearchNB, the New Brunswick Innovation Foundation (NBIF), MITACS, the three federal granting agencies, and other national organizations, we maximize the impact of our research programs.

In many cases, your donation acts as a lever, allowing us to attract more funding, and thereby sometimes doubling or even tripling the value of your contribution, and above all, positioning us favorably in our pursuit of cancer research.

Innovation and Development

By establishing structures, programs and equipment implementation that foster idea development for researchers and their teams, we cultivate an environment where innovation thrives.

General and innovation funds provide researchers with the resources and flexibility needed to explore new avenues, take risks, and pursue bold ideas that have the potential to make a significant difference in the fight against cancer.

Help us make breakthroughs in cancer research. Your generosity allows the Atlantic Cancer Research Institute to push the boundaries of research and bring us closer to a world without cancer.

At the Atlantic Cancer Research Institute, our commitment to advancing cancer research is unwavering. Through strategic investments in research chairs, staff support, knowledge transfer funding, next generation equipment, and unrestricted funds, we strive to accelerate progress towards a future where cancer poses less of a threat to human health.

Join us in our fight to conquer cancer and usher in a new era of hope and solutions for countless patients around the world. Together, let's make a significant difference in the fight against cancer here in Atlantic Canada, leaving an indelible mark in the annals of medical history.

Dr. Nadia Bouhamdani

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