WHO WE ARE

Atlantic Cancer Research Institute (ACRI) researchers are successfully working with partners in Canada and around the world to understand cancer biology and uncover the causes of the disease. This knowledge allows our team to transform discoveries into innovative solutions to cancer, including early detection, molecular diagnosis and prognosis, as well as targeted therapy development. Through this work, ACRI is part of the global research effort aimed at combating cancer and a powerful partner in bringing this research to Atlantic Canadians.

VISION
ACRI is dedicated to pursuing excellence in research that can contribute to finding cures for cancer.

MISSION
ACRI works diligently to identify scientific innovations arising from its research activities that can be translated into patient care.

VALUES
ACRI researchers will work in an independent but collaborative way that ensures we attract and retain a team that exemplifies collegiality, collaboration, professionalism, compassion and commitment.
MESSAGE FROM THE PRESIDENT & SCIENTIFIC DIRECTOR

For ACRI, the past year was one that was marked by major milestones and accomplishments. Building on our strong foundation of recent years, our talented team of dedicated personnel continues its pursuit of research excellence in order to further our understanding of cancer, and apply that knowledge towards solutions for patients that are trying to overcome this disease. As we move forward, the team is inspired and motivated by the courage of people affected by cancer, which in turn fuels our resolve to find solutions for this terrible disease.

Our vision and focus on precision medicine has led us to emerge among the leaders in the field, particularly in the area of liquid biopsy and novel approaches to targeted treatment. Increasingly, our efforts have been focused around the concept of personalized medicine in cancer; a theme that centres around the specific characteristics of a patient’s cancer in order to tailor the appropriate therapeutic response.

Notably, in 2016-2017, our ambitious liquid biopsy team grant entitled, ‘Delivering Precision Medicine through Liquid Biopsy Technologies’ was approved for funding from the Atlantic Canada Opportunities Agency. This project continues to build on our patented extracellular vesicle (EV) capture technologies, allowing us to pursue more ambitious objectives: to provide physicians and patients with a better way to detect, diagnose and monitor cancer using a simple blood test. In the past year, our technology has captured significant interest from both the pharmaceutical and biotechnology industries, which led to signing research and licensing agreements with companies, such as Merck and BioVendor. Other such agreements are forthcoming and will continue to position our technology as the standard-bearer in the liquid biopsy field.

In the past year, we have continued to foster our many partnerships within the cancer research community, whether on a regional, national or international level. On the regional level, the synergy created with our closest partners, the Université de Moncton and the Vitalité Health Network, has led to the successful awarding of funds, from both the Governments of Canada and New Brunswick, to build the New Brunswick Centre for Precision Medicine (NBCPM). Construction of the 4000 m² NBCPM is underway adjacent to the Dr. Georges-L.-Dumont University Hospital Centre and, once completed in 2018, will be the first purpose-built facility for precision medicine in Canada. This cutting-edge infrastructure was greatly needed on two main fronts: first, to bring together the components research, molecular diagnostics and clinical research that are required for precision medicine that will improve patient care; and secondly, to accommodate the growing team of highly-qualified personnel and required equipment.

Our roadmap to the future is charted out in our recently launched Strategic Plan that was jointly developed by the leadership team and our Board of Directors. We thank our volunteer Board of Directors for their counsel and oversight.

Many elements, such as our team’s expertise, motivation and passion, are required to achieve the level of success ACRI has come to know. As well, such achievements would not be within our reach today, without the support of the community, our donors and stakeholders.
SCIENTIFIC ADVISORY BOARD

DR. ANNE-MARIE MES-MASSON
Director of Cancer Research, Institut du cancer de Montréal
Head of Cancer Research, Centre de recherche du Centre hospitalier de l’Université de Montréal

DR. PIERRE THIBAULT
Principal Investigator, Institute for Research in Immunology and Cancer, Université de Montréal
Canadian Research Chair in Proteomics and Bioanalytical Mass Spectrometry

DR. DIANE PROVENCHER
Chief, Gynecologic Oncology Division, Centre hospitalier de l’Université de Montréal

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MESSAGE FROM THE CHAIR OF THE BOARD OF DIRECTORS

Over the past few years, I have had the privilege to work with members of ACRI’s management and research teams, in particular Dr. Rodney Ouellette, President & Scientific Director. In the past year, I have also had the opportunity to work closely with ACRI’s key stakeholders in the process of ACRI’s strategic planning exercise. I must say, that experience has only strengthened my confidence in ACRI’s team, as well as my beliefs in the important work they are accomplishing. The organization has truly evolved through maturity, innovation, motivation and perseverance.

The Board of Directors continue to monitor ACRI’s achievements. We now also recognize that its stakeholders are just as enthusiastic. It really has been exciting to watch ACRI’s visibility steadily increase at the regional, national and international levels. Clearly, the fact that a specialized research centre is located right here in Atlantic Canada is a source of pride for many.
ACRI’s research team continues to expand and the day-to-day challenge remains raising the funds required to move forward with the team’s projects. Previous fundraising campaigns and the community’s generosity and support have contributed enormously to the continuity of ACRI’s research. Therefore, I would like to take this opportunity to thank, once again, the community of Atlantic Canada for its continued support. Together we can find solutions to this terrible disease.

I must also acknowledge the dedication of the Board. Their varied expertise and desire to contribute is certainly an asset to ACRI. In addition, I would like to welcome members that have joined us over the past year. Namely, Dr. Francis LeBlanc and Johanne Roy. We feel very fortunate to have added fresh perspectives to our team. On that note, I also wish to thank members that have moved on to new projects, Dr. Lise Dubois and Richard Losier. Their commitment and dedication will forever be remembered.

Finally, as mentioned earlier, the Board of Directors has approved a new Strategic Plan for 2016-2021 (see page 15). The Plan builds on ACRI’s achievements over the past years and charts a path to realize even more success at the 20th anniversary mark in 2018, as well as to set a positive trajectory for the Institute’s 25th anniversary in 2023. It certainly sets an ambitious agenda for ACRI’s research, with a continued focus on collaboration to improve outcomes for cancer patients, especially those residing in Atlantic Canada. I am very pleased to say that ACRI has already proven its dedication to this mission, with its current collaboration with the Université de Moncton and the Vitalité Health Network, as the New Brunswick Centre for Precision Medicine is taking shape as we speak. There are certainly exciting times ahead!

GILLES LEBLANC
Chair of the Board of Directors
BUILDING RESEARCH MOMENTUM

The past year has seen scientists at ACRI advance their research on precision medicine, which is the delivery of the best treatment to each cancer patient by using information on the characteristics of his/her tumour. A major part of ACRI’s precision medicine research is focused on the development of technologies that enable liquid biopsy, which has the potential to permit the screening and monitoring of cancer through a simple blood or urine test. To this end, our scientists have optimized the method for using ACRI’s proprietary Vn96 peptide, which can capture packets of information known as EVs, with clinical blood samples. These advances position ACRI to not only determine whether EV capture can improve the efficacy of currently-used cancer diagnostic and prognostic biomarkers, but will also allow our team to discover and test new cancer biomarkers.

Despite a difficult funding environment for fundamental medical research in Canada, ACRI has captured new funding for its research efforts. Specifically, ACRI scientists received an Atlantic Innovation Fund (AFI) grant from the Atlantic Canada Opportunities Agency. These dollars will allow ACRI to continue to pursue its liquid biopsy research, with a particular focus on getting the Vn96 peptide into the clinic for cancer diagnosis, prognostic testing and patient monitoring. Our scientists will also advance the development of other new EV capture technologies that are based on simple polysaccharides.

In addition to ACRI’s research on precision medicine, its scientists have been making discoveries on the fundamental nature of cancer cells. From understanding the changes that occur in cells in response to stressful conditions (such as those that occur in the tumour environment) to the characterization of the signalling pathways that are essential for cancer progression, ACRI’s research is contributing to the global effort to understand how cancer cells work. The ultimate goal of these diverse studies is to use this information to better deploy our current arsenal of cancer treatments, develop novel therapeutic approaches and new diagnostic methods.
SELECTED PUBLICATIONS:


RESEARCH FOCI

LIQUID BIOPSY
The ACRI team is working to identify the specific proteins and RNAs that are released from cancer cells in small packages known as exosomes and/or microvesicles (collectively known as EVs). By using a novel, proprietary technology developed at ACRI (the Vn96 peptide), ACRI scientists are able to rapidly and efficiently capture EVs from both cell culture and body fluids for downstream analyses of their contents. These cancer-specific proteins and RNAs hold the potential to be used as new biomarkers for cancer detection by minimally-invasive approaches (i.e. blood or urine samples), a process termed liquid biopsy. ACRI is focused on advancing its Vn96 EV capture technology to enable new cancer diagnostic, prognostic and treatment-response tests based on the principle of liquid biopsy.

SYNTHETIC LETHALITY
An approach called synthetic lethality targets biological systems in which two or more genetic pathways interact to contribute to a vital cellular process. The loss of either pathway does not threaten cell viability and may indeed provide a survival advantage, such as the case with cancer cells; however, lethality is observed when both pathways are inhibited, which may be achieved using specific inhibitory compounds. ACRI scientists are working to identify the pathways in cancer cells that can elicit synthetic lethality and develop compounds that can take advantage of these discoveries. These experiments will lead to compounds that target only cancer cells (which already have loss of function in one pathway) and have no effect on normal cells, thus avoiding the side effects associated with current therapies.
MICROWAVE-ASSISTED TUMOUR ABLATION

The ACRI medical technologies research team, recipients of an NBIF Research Chair, is investigating the use of microwaves as an energy source for the detection and treatment of cancer. This research subject is a core disruptive technology that will lead to the development of new, non-invasive treatments and more precise screening methods in the detection of cancer. Specifically, the team is investigating the properties of diseased tissues to guide them in the selection of conditions that will lead to improved ablation efficiencies. The team is confident that this research will lead to the improvement of microwave ablation technologies by allowing unparalleled control on the shape and penetration of the microwaves used to ablate diseased tissues. Thereby, leading to less collateral damage to healthy tissues, while reducing recovery time for the patient.

GENE PATHWAYS & REGULATION

Several ACRI scientists are working on understanding the mechanisms that underlie the key cellular activities that are important for cancer cell growth. Our researchers are currently investigating the regulation of gene expression and how this is changed in cancer cells, with specific foci on metastatic breast cancer and kidney cancer. In addition, our researchers are designing and testing new drugs that interfere with these activities that are critical for cancer cell growth.
“Our liquid biopsy technology allows doctors to start with a patient’s blood or urine sample and determine, in real-time, the current state of an ever-changing disease like cancer.”

– Dr. Rodney Ouellette, President & Scientific Director
Liquid biopsy is an aggressive market primed for adoption. It is rapidly growing with a compound annual growth rate (CAGR) of over 20% for the next five years. Some experts estimate a market opportunity between USD 20 and 200 billion, as evidenced by waves of investment funding in this industry since 2015. While most past large investments have predominantly been focusing on the circulating tumour cell (CTC) and circulating tumour DNA (ctDNA) market segments, the EV segment is gaining significant grounds. This is due to new discoveries of the functions of EVs and their relation to diseases. Also, CTCs and ctDNA are present in very low concentrations in the blood and they appear in later stage cancers making them harder to detect and use for diagnostics. Unlike CTCs and ctDNA, using EVs as a source of biomarkers has a broader period of applicability for the detection of diseases that range from cancer to neurodegenerative diseases, like Alzheimer’s disease and Amyotrophic Lateral Sclerosis (ALS).

In addition to being able to capture EVs in earlier stage diseases and monitor diseases over time, diagnostic labs armed with EV capture technologies have the capacity to analyse EVs for multiple parameters within the same processed sample. This is particularly important when clinical labs only have access to a limited sample volume. EVs can also be isolated from frozen biological fluids, like human plasma, giving them another big advantage over other circulating biomarker sources.
INTELLECTUAL PROPERTY

ACRI has been granted a USPTO patent, is also in the final stages of approval for its Vn96 technology in Europe and is continuing patent prosecution in Canada and other territories. Patent prosecution for ACRI’s polysaccharide-based EV isolation method is also in progress. ACRI has strategically chosen to apply for a patent for these methods in Canada, the United States and Europe to maximize the commercial reach for the technologies to the biggest players within the liquid biopsy market.

ACRI has also filed for an international patent application for a novel microwave-assisted tumour ablation procedure. This patent application stems from the research efforts of the NBIF Research Chair in Medical Technologies that aims to bring more efficient tumour ablation techniques to the market, thus accelerating research in this field and leading to fewer complications for the patient.

Moreover, the polysaccharide method has generated particular industry interest, as ACRI’s candidate molecules used to isolate EVs are already FDA approved for multiple formulations, wound healing and internal uses in human medicine. Therefore, an EV capture technology that uses these molecules strategically fits the demand for EV isolation technologies that are applicable for therapeutic uses. To this end, ACRI has initiated discussions with stem cell companies wanting to use EVs as therapeutic vehicles.

TECHNOLOGY TRANSFER AND INDUSTRY COLLABORATIONS

The past year has been particularly prolific for ACRI’s technology transfer initiatives. With the securing of the new AIF initiative, ACRI has better positioned itself to optimize and commercialize its liquid biopsy enabling technologies. In fact, a few months later, ACRI was able to sign its first technology licensing deal with the Czech company BioVendor for clinical and diagnostic purposes in patients.

The agreement gives BioVendor non-exclusive rights to use the Vn96 peptide for the isolation of EVs in the diagnosis of diseases, such as cancer. BioVendor’s R&D assays for in vitro diagnostics are aimed at rapidly growing fields of interest within the international research and diagnostic community, such as the oncology and liquid biopsy markets.

ACRI’s strategy is to enable many end-users, bringing liquid biopsy technologies to more patients. ACRI has ongoing discussions and collaborations with academia and industry. The liquid biopsy initiative has support from the pharmaceutical industry, including companies such as Merck Canada through the Personalize My Treatment (PMT) initiative led by the Exactis Innovation network, for which ACRI is a partner. ACRI hopes to bring to the industry a much-needed method to standardize EV isolation. Standardization is essential in the validation of biomarkers for liquid biopsy. The team continues collaborating with companies and research organizations operating complementary interest fields. These ongoing collaborations and partnerships will bring fast, easy cancer and disease diagnostic/monitoring tests to the market.

Activities on the medical technologies initiative have also generated some industry interest. In fact, ongoing research projects have received support from microwave generator and ablation probe manufacturers. These manufacturing companies were instrumental in providing the essential equipment needed to enable the ACRI team to start experimentations and build on its innovative capacity.

“The license agreement is a very important piece in our strategy to bring innovative immunoassays that target miRNA as clinically valuable biomarkers.”

– Viktor Růžička, M.D.,
CEO of BioVendor – Laboratorní medicína a.s.
LOOKING FORWARD: THE STRATEGIC PLAN

ACRI is poised for success as a mature research organization with a new Strategic Plan as the foundation for growth and development.

In 2016, the ACRI team and Board of Directors participated in a process to define its next strategic chapter, affirming a multi-dimensional plan to leverage 15 years of hard work, generate dividends arising from the extraordinary talent of its team, payback the investment in equipment and prepare for new opportunities.

The Plan also reflects the aspirations and expectations of internal team members, as well as external partners and stakeholders. Without exception, the internal team and the external individuals consulted during drafting of the Strategic Plan expressed admiration and support for ACRI’s mission. However, they all have equally high expectations for future performance now that the organization has grown out of startup, incubation and formulation mode to become another forceful scientific nucleus in Canada.

The Strategic Plan foresees a formidable agenda for action, drawing on the resourcefulness and ingenuity of ACRI leaders.

- ACRI will advocate tirelessly, building upon its own identity and reputation, to establish a thriving cancer research capability anchored on Canada’s east coast. It will serve as a focal point for accelerated, clustered expansion in the sector.

- Business development activities, including licensing, joint venture advancement and assertive marketing, will be expanded to enable ACRI to take advantage of intellectual property now emerging from the first 15 years of discovery.

- Leaders will organize and align themselves with others in the region to request a fair share of public research investment dollars. They will bid for both public and private funding that can fuel future diagnosis or treatment breakthroughs.

- Community engagement and connection will be deepened to demonstrate how scientific advancement and public support go hand in hand to help meet the financial needs of research activity.

To bring the goals of the Plan to fruition, ACRI is committed to robust, disciplined management and governance structures, including performance measurement that reflect its current level of maturity.

It is fitting that as ACRI embarks on a program to fulfil its new set of strategic objectives, it will also plan for relocation to a new office facility, giving it a permanence and profile befitting its resilience and determination.

There is no question that many considered ACRI an unlikely candidate to carve out a place in the national health research community. But, the new Strategic Plan resonates with a resounding coming-of-age statement for this improbable success story, the legacy infrastructure of people and the innovation it has brought to the Atlantic region. The Plan is a roadmap, taking ACRI to its next set of anniversary milestones at age 20 and 25, respectively, with an ambitious program that will continue to astonish and impress.
A GROWING FAMILY

TEAMS BY INITIATIVES:

LIQUID BIOPSY
ANIRBAN GHOSH, PhD – Research Scientist
JEREMY ROY, PhD – Research Associate
ROSTYSLAV HORBAY, PhD – Research Associate
AWANIT KUMAR, PhD – Postdoctoral Fellow
CRAIG AYRE, PhD – Postdoctoral Fellow
SAMI BENZINA, PhD – Postdoctoral Fellow
BIJI ANISH, MSc – Research Technician
SHEENA FRY, MSc – Research Technician
SEBASTIEN FOURNIER, BSc – Research Assistant
NAOUFAL EL BEKKOURI, MSc Candidate
NGUYET (NA) NGUYEN, MSc – Research Technician

SYNTHETIC LETHALITY
SANDRA TURCOTTE, PhD – Research Scientist
ERIC MERZETTI, PhD – Postdoctoral Fellow

NICHOLE CUMBY, PhD – Postdoctoral Fellow
CHARLES BULLERWELL, PhD – Research Associate
PIERRE DEPREZ, PhD – Postdoctoral Fellow
PIERRE LYONS, MSc – Research Technician
SONIA DASTOUS, MSc – Research Technician
NADIA BOUHAMDANI, PhD Candidate
DOMINIQUE COMEAU, MSc Candidate
LAURA AYRE – Research Assistant

CELLULAR MECHANISMS & BIOMARKER DISCOVERY
GILLES ROBICHAUD, PhD – Research Scientist
ALEXANDRE PARKS, PhD Candidate
JASON HARQUAIL, PhD Candidate
ROXANN GUERRETTE, PhD Candidate
BRANDON HANNAY, MSc Candidate
AMIT BERA, PhD – Postdoctoral Fellow
LAURA FROST, MSc – Research Technician
MICROWAVE-ASSISTED TUMOUR ABLATION TECHNOLOGIES
JOCELYN PARÉ, PhD, MSM – Research Scientist
JACQUELINE BÉLANGER, PhD – Research Scientist
ALEXANDRE ARSENEAU, MASc Candidate – Engineering
MARC-ANDRÉ RICHARD, MASc Candidate – Engineering

CORE FACILITIES:
MASS SPECTROMETRY
DAVID BARNETT, PhD – Research Scientist
ANDREW JOY, MSc – Research Technician
MAI NGOC-NU, BSc – Research Assistant

NEXT-GENERATION SEQUENCING
ANNIE-PIER BEAUREGARD, MSc – Research Technician
DARWIN D’SOUZA, MSc – Bioinformatician
DANIEL LÉGER, MSc – Bioinformatician
SIMI CHACKO, MSc – Research Technician

MANAGEMENT:
RODNEY OUELLETTE, MD, PhD – President & Scientific Director
HAI LEQUANG, CPA, CA, MSc – Director of Finance & Administration
STEPHEN LEWIS, PhD – Assistant Scientific Director
NADINE MARTIN, MBA – Communications Agent (ACRI)/Clinic Director (Conceptia)
REMI RICHARD, MSc, MBA – Business Development Officer
RENÉE MCLAREN, BA – Human Resources & Administration Officer
SOPHIE WILLIAMS – Executive Assistant
The ACRI ended the 2016-2017 fiscal year with a surplus of $351,671, in comparison to a surplus of $307,905 in 2015-2016.

The budget for the year 2016-2017 represented a surplus of $84,631. Compared to last year, and as a result of being in the third year of the five-year Cancer Research Saves Lives campaign, revenues generated from donations have decreased. Nevertheless, we are always so very thankful for the solid commitment of our donors. Decreased donations are off-set by the increase in the revenue of research grants and medical services.

The Institute continues to succeed in obtaining research grants from different research funding agencies. In return, these funds are invested in additional highly-qualified personnel and new technology. In 2016-2017, the Institute invested $576,000 in specialized equipment which allowed our research team to activate the new project, ‘Delivering Precision Medicine through Liquid Biopsy Technologies.’

The Atlantic Cancer Research Institute is a non-profit organization. All earnings are retained and reinvested in the Institute’s operations and development.