



Cancer Research - Atlantic Region

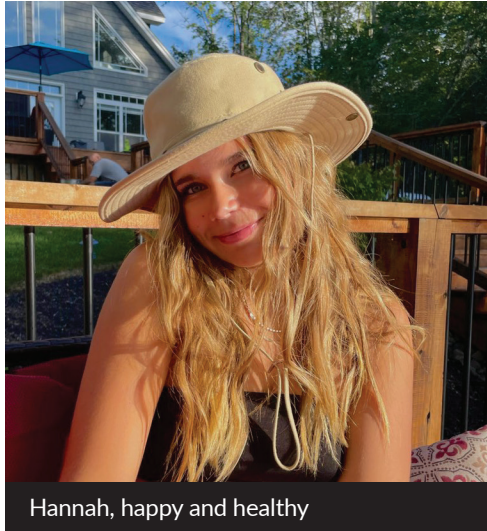
A Look Back at Last Year's Progress and What You Made Possible



Canadian
Cancer
Society

2022 Atlantic Cancer Research
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A Father's Message of Gratitude



Hannah, happy and healthy

Cancer changed the lives of Hannah and her family when she was just 9 years old. It was not easy but with the current treatments for acute lymphoblastic leukemia (ALL), her doctors were confident she would fully recover.

"You do what you've got to do but you're just in a fog ... You just can't think. You can't function. You're just broken. You're heartbroken." Cory and Tammy, Hannah's parents stayed with her in the hospital for a solid 2 weeks. They slept in shifts on the floor of the hospital on foam mats. They were with Hannah through every treatment and were uplifted from the support of friends and family.

Cory, a **J.D. Irving, Limited** employee for over twenty years, shared, "I will always remember when Hannah's doctor told us that if she was diagnosed 20 years

ago, this could have been a fatal diagnosis. We're so thankful for all the advances in cancer medicine and we know that donations are a big part of those improvements."

Hannah is now 16 years old, living in Quispamsis, New Brunswick. She is grateful to now be cancer-free and live the life of a typical teenager.

Cory continues, "The only reason I have my daughter today is because of the financial support that is funding cancer research. The research that they're doing, it's just so amazing how they can connect the dots. All these wonderful scientists and doctors are so dedicated to finding ways to save lives. These discoveries will change the lives of so many other families like ours. I can't say thank you enough to everyone who is able to contribute - you are just true heroes."

"If it weren't for the funding and research, I know I wouldn't be here today. I am incredibly thankful for those who find it in their hearts to give. Thank you from the bottom of my heart."

- Hannah Gallant



From Curious Kids to Cancer Researchers

Your Support is Helping Young Talent Grow and Thrive

Young researchers who are full of youthful imagination and optimism are receiving training and opportunities to work in the cancer field thanks to funding from donors like you. These scholarship students are being mentored by some of the very best Atlantic cancer researchers.

Because of your investment in research, and for many in the **J.D. Irving Limited - Excellence in Cancer Research Fund**, Atlantic-based researchers are harnessing their natural curiosity and advancing cancer treatments. These researchers are excited to share their innovative developments over the last year with you. You are also helping people like Hannah, get better treatments by supporting these incredibly talented cancer researchers do what they do best - find solutions.

 **Special 2023 Announcement**

Congratulations to Dr Robin Urquhart!

Breakthrough Grant Recipient

Examining risks of exposure to carcinogens like arsenic, radon gas and air pollution to help detect lung cancer earlier.



Boundless curiosity. Unparalleled imagination. A brighter future.



“This award is important to me, not just because of the financial support, but also because it strengthens my conviction in the decision to pursue a cancer research career.”
Kazeem Adefemi, award recipient

Because of you, students have a chance to learn from the best

Donors like you play an essential role in bringing together a diverse community of cancer researchers through our valued partnership with the Beatrice Hunter Cancer Research Institute (BHCRI). Together, we are pursuing a common goal: to save lives and ease the burden of cancer on individuals, families, and society. The BHCRI conference is an occasion for the trainees to network and be mentored by senior researchers, such as those listed in this report.

So far, there are three cohorts of trainees and we are excited to say that Patrick Pearson and Naeimeh Jafari have both completed their terms this year. Patrick defended his thesis and will be specializing in health policy and Naeimeh is continuing her postdoctoral position with Dr Leung. Rachel Lee, Vlora Riberdy and Miranda Steeves are new students to the program this year. Students continuing from last year are Kazeem Adefemi, Samlau Kutana, Raj Arun and Olivier Philips. Kazeem presented his research at 2 conferences, Samlau presented at 3 conferences in 2022, Raj is completing his first year of funding, and Olivier was listed on 2 publications.

“Cancer research is something that is of great importance to me, in both my academic pursuits, as well as in my personal life. The funding graciously provided by **J.D. Irving Limited – Excellence in Cancer Research Fund** provides great peace of mind knowing that my daily living expenses are covered. The funding provided will be indispensable for myself and my research’s success.”

Patrick Pearson, award recipient

World-Leading Research in Atlantic Canada

Thanks to funders like **J.D. Irving, Limited** and others like you, these young cancer researchers can engage with and learn from other changemakers who share their passion.



Dalhousie University

- Dr Jeanette Boudreau*
- Dr Melanie Keats*
- Dr Andrew Makrigiannis*
- Dr Jean Marshall*
- Dr Nathalie Saint-Jacques*
- Dr Robin Urquhart*
- Dr David Waisman*
- Dr Morgan Langille
- Dr Paola Marignani
- Ms. Vlora Riberdy**
- Dr Raj Pranap Arun**
- Dr Naeimeh Jafari**
- Mr. Stefan-Heinze-Milne



Memorial University of Newfoundland

- Dr Sheila Garland*
- Mr. Samlau Kutana**
- Ms. Rachel Lee**
- Mr. Patrick Pearson**
- Dr Rodney Ouellette*
- Dr Gilles Robichaud
- Dr Sandra Turcotte



Université de Moncton

- Mr. Kazeem Adefemi**



University of New Brunswick

- Dr Anthony Reiman
- Ms. Kathleen Varty**



University of Prince Edward Island

- Dr J Patrick Murphy*
- Dr Marya Ahmed
- Mr. Olivier Philips**
- Ms. Miranda Steeves

*J.D. Irving, Limited – Excellence in Cancer Research Fund researcher recipients

**J.D. Irving Limited – Excellence in Cancer Research Fund scholarship recipients





Dr Andrew P. Makrigiannis, Ph.D. Professor, Department of Microbiology and Immunology Senior Scientist, Beatrice Hunter Cancer Research Institute Dalhousie University

Your support is funding breast cancer vaccine development

Dr Andrew Makrigiannis

A breast cancer vaccine that can be modified to target other cancers

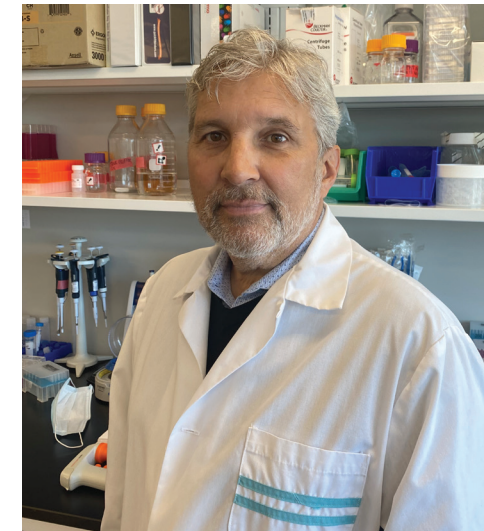
Thanks to the **J.D. Irving, Limited – Excellence in Cancer Research Fund**, new funding was granted in 2022 to study treatment-resistant and metastatic breast cancers that cannot be treated with surgery, radiation or chemotherapy. These cancers require additional targeted therapies that improve the immune system’s ability to kill cancer cells.

But due to safety, cost and effectiveness, these therapies currently have limited potential for use in other types of cancer. If a recently discovered immune cell could be trained or modified to recognize specific types of cancers, it would lead to new treatment options for various types and stages of breast cancer as well as other types of cancer.

Dr Andrew Makrigiannis and his team are studying recently discovered immune cells – the memory natural killer (NK) cell. The research team is working to understand more about the detection and elimination of breast cancer cells.

Next, the team will test whether NK cells can be targeted and modified to remember and recognize specific types of tumour cells. If successful, this work could lead to an immunotherapy that is effective against a broader range of breast tumours and could even be repurposed to target other types of cancers.

Some incredible research highlights from 2022



Dr Rodney Ouellette, Founder and Senior Scientist, R. R. Leger-NBHRF Chair in Precision Cancer Research Atlantic Cancer Research Institute

Dr Rodney Ouellette

Last year we highlighted Dr Ouellette’s work in our impact report, and this year we are excited to share some significant progress from his lab.

Immunotherapy drugs that unlock a person’s immune system to attack tumours have shown remarkable promise in treating lung cancer. Unfortunately, not all patients respond to these immunotherapies and researchers still do not understand why some patients respond while others do not.

This is why understanding the ways tumours evade the effect of immunotherapy drugs is necessary to increase the number of lung cancer patients that will benefit from this treatment. Cancer and immune cells release small particles called extracellular vesicles (EVs) into our blood. EVs carry messages that can instruct our immune system to shut down or to avoid attacking the cancer. Dr Rodney Ouellette and his team are studying these messages in the blood of lung cancer patients.

So far, they have recruited an additional 60 patients to the study group since early 2022. Of these, they have analyzed 24 patients by sequencing and cytokine profiling. Using a liquid biopsy technology that they invented, the research team is looking through the gene

sequencing and protein data of the individual patients. Thus far, the findings confirm their preliminary results where they see distinct differences in responders vs non-responders. This is also identifying potential targets for validation towards the development of new therapeutic strategies.

Dr Ouellette shared a recent update, “This study should allow us to provide the right treatment for responsive patients while avoiding potentially harmful side effects for non-responsive patients. More importantly, this will help us understand why some patients do not respond to treatments and will advance new treatment combinations that overcome the barriers to response. These findings may also be applicable to other types of cancer.”



Dr Jean Marshall, Professor, Department of Microbiology and Immunology, Arthur B. McDonald Chair, Dalhousie University, Senior Scientist, Beatrice Hunter Cancer Research Institute.

Dr Jean Marshall

Over the past year, Dr Jean Marshall, and her team, led by Dr Ian Haidl, have significantly progressed the objectives of their project. They have developed “mast cells” (a type of immune cell) that produce an immune response when mice eat specialized food containing a particular antibiotic. When these mast cells are stimulated, the ovarian cancer in a mouse model of this disease, progresses more slowly than in control mice.

Further to this, they have discovered that cancer progression is not limited to the earliest stages of the disease. If mast cells are activated, even more than 2 weeks after the initiation of ovarian cancer, it is still effective in substantially reducing cancer progression.

Previous data showed that a mast cell activated immune response could inhibit cancer growth, but only when initiated at the same time as when the tumour cells were introduced.

The team’s new data suggests greater promise for this novel mast cell therapeutic approach in combatting established ovarian cancer.



Dr Patrick Murphy, Assistant Professor, Biology, University of Prince Edward Island

Dr Patrick Murphy

In the first year of the project, graduate and undergraduate trainees in Dr Patrick Murphy’s laboratory performed metabolomic (large scale study of metabolites) analyses alongside growth tests in the presence of blockers of biosynthesis pathways in breast cancer cells.

Through new collaborations with other breast cancer researchers and the Atlantic Cancer Consortium Marathon of Hope, they have leveraged the use of some of the funds on this project to support data collection on banked cancer specimens.

The most exciting finding from this work is new evidence of metabolites that are dependent on the biosynthesis pathway in breast cancer cells. Further understanding of how these metabolites support tumour growth and immune evasion, will inspire the design of small molecule drugs that may be used to target cancers that depend on this pathway.

Meet the Researcher

“Thank you for everything you do to support research and to support those living with cancer. Your hard work makes the future brighter.”

Why cancer research: I became drawn to cancer research when I realized that my area of immunology research had the potential to improve cancer therapy. There are so many ways that the power of the immune system can be harnessed to prevent and treat cancer. I was also influenced by how cancer had impacted the lives of my family and friends.

What funding means: This funding is a tremendous boost to our research team. It enables us to properly pursue an exciting project with new approaches to ovarian cancer therapy - allowing us to better understand how our bodies fight tumours.

Desired impact: Through this research we aim to develop and test, in preclinical models, and create entirely new approaches to ovarian cancer therapy using mast cells. It will also provide new tools to examine the best approach to boosting local anti-tumour immunity for a variety of peritoneal cancers.

Life or research motto: “Alone we can do so little; together we can do so much” – Helen Keller

Best advice received: As a former mentor once told me “it is an enormous privilege to be able to do medical research, always keep in mind the people you are doing it for”.

Meet the Researcher

“I am incredibly grateful to the donors who give tremendously to cancer research. Through funding received from the J.D. Irving, Limited – Excellence in Cancer Research Fund, I know firsthand how valuable these scholarships are to students.”

Why cancer research: I enjoy figuring out how things work. I have always been drawn to cancer research because studying cells that are growing out of control (not working) has historically taught us a great deal about how normal cells function. The opportunity to be able to use this information to find new strategies to help people with cancer is incredibly exciting and rewarding.

What funding means: Funding means my laboratory can train the next generation of cancer researchers to use cutting edge technology to find new ways to target cancer in the age of precision medicine.

Desired impact: I hope to see some part of what we do in the laboratory influence how cancer patients are stratified for precision treatments.

Life or research motto: “Progress in science depends on new techniques, new discoveries, and new ideas, probably in that order” – Sydney Brenner

Best advice received: My postdoctoral mentor, Dr Steve Gygi, told me “if you want to do something, just find a way to get it done, and think BIG!”



Dr Waisman, PhD, Dalhousie University.

Dr David Waisman

Dr David Waisman and his team are working on research that will help people living with cancer, across all cancer types. Some of the work they are doing involves characterizing a new plasminogen receptor they think will play a key role in cancer cell invasion and metastasis. Though this might sound very technical, plasminogen is a protein found in the blood that is important in blood clotting and the breakdown of clots. The cells that line the blood vessels use proteins called plasminogen receptors, which are located on their cell surface to convert plasminogen to its active form, plasmin. Plasmin chews up blood clots that might form in the circulation, thereby preventing heart attack and stroke. Cancer cells hijack this normal process and produce plasminogen receptors on their cell surface, which chews up the tissue barrier that forms around tumors. This allows the cancer cells to flee the tumor, enter the bloodstream, and accumulate in other tissues.

The Waisman lab believes that they have identified one of these plasminogen receptors that play a role in cancer progression and metastasis. When high levels of the protein, calreticulin (CRT) are expressed by cancer cells, it usually indicates aggressive cancer. The Waisman team determined that CRT has an unexpected function as a plasminogen receptor.

This discovery may provide insight into the established role of CRT in cancer by better understanding the role that CRT has in the growth or spread of cancer cells and that CRT may be a key mediator of plasmin function. More studies will be necessary to identify the extent to which cancer cells utilize CRT for plasmin function and cancer progression. The team anticipates submitting a paper for publication shortly to share this content with the scientific community.

Meet the Researcher

“You are truly amazing people who should be proud that you act in a tireless and selfless manner to serve in the army of people who fight against this terrible disease. We in the research community are in your debt.”

Why cancer research: I am a Biochemist, and cancer is a biochemical disease. The successful treatment and, ultimately, the cure for cancer will come from an understanding of the biochemistry of the disease. Cancer is a disease that terrifies most people. Thus we need to take an aggressive posture against this disease by identifying the biochemical defects that allow cancer to initiate, fester, and ultimately to spread.

What funding means: Without funding from agencies such as the CCS, we would not be able to pursue avenues of research that one day may lead to new treatments.

Desired impact: To solve a small part of the puzzle, which is cancer.

Life or research motto: Research is seeing what everybody else has seen and thinking what nobody else has thought.

Best advice received: Research- it’s fun and exciting when it’s fun and exciting. And on other days, it can be frustrating and mind-numbing. Don’t let the frustrating days cloud the joy of the exciting days when discoveries are made.

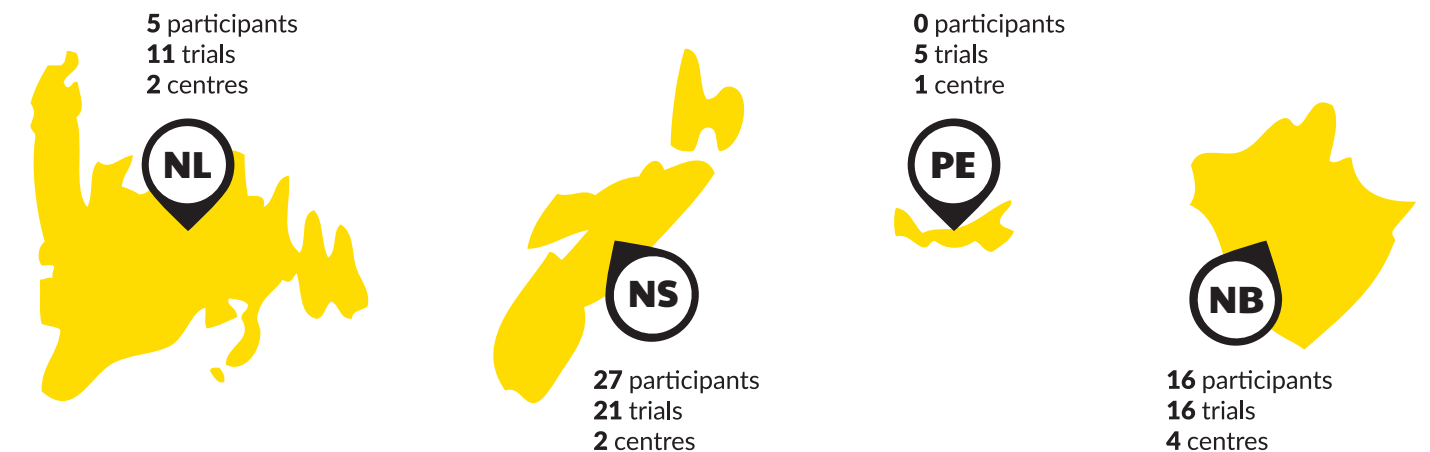
You are helping to make clinical trials available for Atlantic Canadians

Innovation in cancer care is incredibly important for families dealing with a diagnosis. Your support is vital to expanding access to new treatment options and increasing the number of clinical trial participants through collaborations with top clinical partners worldwide. One of the significant ways that you are funding clinical trials is through the Canadian Cancer Trials Group (CCTG). CCTG is a national program of the Canada Cancer Society. Due to Atlantic Canada’s small population, reaching clinical trial participant targets could take even longer without these partnerships, especially those related to rare cancers.

“Part of our mission is to do trials that wouldn’t be done by industry. The best way to help Canadians is to focus on questions that are relevant to Canadian patients and our health care system.”

– Dr Dancey,
Canadian Clinical Trials Group

Atlantic Canada cancer trials



Thank you for your incredible generosity

It is because of you that:

- Cancer researchers in the Atlantic are making great strides every year.
- Students are receiving mentorship and funding so they can make progress in life-saving scientific discoveries.
- Atlantic Canadian researchers are paving the way for world leading cancer treatments.

You remind us every day of how important investing in research is to people like Hannah and her family. Because of your support of innovative new research, we are seeing true advances in cancer treatment.

Thank you for helping to bring these transformations forward.



**Canadian
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