Applicant Institution	Project Title Summary	Grant Duration

| **Philippe Després** Laval University | | **$450,000** **2024-2027** |

Artificial intelligence for analyzing medical images related to cancer

Dr Philippe Després is using artificial intelligence to help clinicians and researchers more efficiently apply medical imaging data from people with cancer. Artificial intelligence (AI) can help clinicians and researchers uncover information from medical imaging scans, such as those from CT or MRI imaging and from close-up pictures of tumour tissue under a microscope. But training these AI systems requires high-quality data that must be processed and stored in a way that AI systems can use. With Canadian Cancer Society funding, Dr Philippe Després has built a digital platform called PARADIM to store and process large image collections for the development of AI applications. The research team will add functionalities to this platform in order to process detailed pictures of tumour tissue taken under a microscope. The team will also ensure the data are available widely so that more researchers can access it and people with cancer can benefit. This project will enhance an existing platform for AI-assisted analysis of medical images, speeding up research advances and improving care for people with cancer.

| **Benjamin Haibe-Kains** Princess Margaret Cancer Centre – UHN | | **$125,000** **2024-2026** |

Sharing data about cancer treatment responses to improve personalized medicine approaches

Dr Benjamin Haibe-Kains is developing an online platform to share data about responses to cancer treatment through donated and lab-based samples. Using advanced genetic and molecular tests to tailor treatments to people with cancer has been successful in improving outcomes. However, not all people with cancer benefit and some tumours still don't have personalized treatment options. Improvements in the tests used to guide personalized treatments are needed so that more people with cancer can benefit. With Canadian Cancer Society funding, Dr Benjamin Haibe-Kains is leading a team to create an online platform that allows researchers to more easily share data generated from samples donated by people with cancer. This new data-sharing platform will allow researchers to mine the complex combination of molecular and treatment data of these donated and lab-based cancer models. Sharing and analysing these data in a centralized online platform will lead to new personalized medicine approaches for people with cancer, improving their outcomes and minimizing treatment toxicities.

Better cancer care and prevention for Red River Métis people in Manitoba

The Health & Wellness team at the Manitoba Métis Federation (MMF), the National Government of the Red River Métis, is working to collate and analyze cancer data from the Red River Métis to develop cancer prevention strategies and better cancer care for people in the community. The Red River Métis in Manitoba face significant health challenges due to historical colonial policies, inadequate healthcare, and a lack of available health data. It is known that community members have substantially higher rates of lung cancer, but insufficient data on cancer care and other cancer types means it is difficult to provide appropriate care for people with cancer in the community. With funding from the Canadian Cancer Society, MMF's Health team will conduct a study in partnership with the Manitoba Centre for Health Policy to identify information on cancer incidence, stage at diagnosis, treatments and their efficacy and other information such as smoking rates. The researchers will analyze this information to examine the underlying causes of cancer in the Red River Métis population and develop targeted interventions for prevention, as well as strategies to facilitate better treatments and support for community members diagnosed with cancer. This project will lead to better care for Red River Métis people with cancer and preventative strategies to lower cancer incidence in the community.

Speeding up processing of medical images for cancer research

Dr Andrew Hope is developing a new, faster way to process medical images so that the data can be used for large-scale machine learning and artificial intelligence analysis, speeding up cancer research. Medical images of tumours and healthy tissues are vital to help clinicians detect, visualize and assess a person's tumour lesions and how they respond to therapy. These images often require manual analysis by clinical experts, but increasingly, new technologies promise to help speed up this process by automating parts of it. Unfortunately, preparing these images for automated analysis and making sure they are in formats that are directly comparable is currently time-consuming. New strategies to speed up this process are needed. With Canadian Cancer Society funding, Dr Andrew Hope is leading a team to develop standard processing of medical images of healthy and tumour tissue from over 10,000 people with cancer, allowing them to be analyzed by artificial intelligence. The team will also share their tools and database of images with other cancer researchers online to maximize the benefit to people with cancer. If successful, this project will lead to a new way of processing medical images for analysis and will provide a large dataset of medical imaging data from people with cancer to be used by researchers globally.

| Jennifer Jones | $124,855 |
| Princess Margaret Cancer Centre – UHN | 2024-2026 |

Using data directly from people with kidney cancer to improve outcomes and care

Dr Jennifer Jones is working with the Kidney Cancer Research Network of Canada to create a platform and system that captures the experiences and health outcomes of kidney cancer patients. Including the perspectives of people with cancer into medical care is increasingly vital. Working with the Kidney Cancer Research Network of Canada, Dr Jennifer Jones is leading a team to create a platform and system that captures the experiences and health outcomes of kidney cancer patients in Canada, providing valuable insight into how cancer and its treatments affect their quality of life. With Canadian Cancer Society funding, Dr Jones will build on a successful existing network, which tracks clinical and biological data for kidney cancer patients, to add patient voices to the database, allowing their experiences to be integrated into medical care. The plan includes developing a web-based platform where patients can easily share their health experiences, testing its feasibility at nine centres across Canada and analyzing the results to guide future improvements. Ultimately, this initiative will enhance care for kidney cancer patients and serve as a model for patient-focused research in other cancers across Canada.

| Mark Levine | $450,000 |
| McMaster University | 2024-2027 |

Updating a Learning Health System to improve care and research for people with breast cancer

Dr Mark Levine is using artificial intelligence and electronic health records to update a Learning Health System in a regional cancer centre in Ontario. Information collected from clinical care often takes a long time to ultimately be fed back into improving the healthcare system. Learning Health Systems are designed to constantly use real-time information from people with cancer to inform clinical practice. However, for a Learning Health System to be effective, robust information storage and processing systems are needed, which can be difficult to develop and run. With funding from the Canadian Cancer Society, Dr Mark Levine's team will improve a database of 7,000 people with breast cancer treated at Juravinski Cancer Center in Hamilton, Ontario. Building on their previous work using AI and electronic health records to create the database and keep it up to date, the team is now adding information about genetic tests and reconstructive surgeries. They are also expanding the database to another hospital in the local area and adding missing information by connecting to the provincial registry. The updated Learning Health System will promote research and quality improvement, including identifying people with breast cancer who might be eligible for clinical trials. The results from this project could also be applied to other cancer centres in Canada.

Victor Martinez IWK Health	**$124,062** **2024-2026**

Easier data access to improve care for children with cancer in the Maritime provinces

Dr Victor Martinez is developing a new platform to collate and translate data from children with cancer in the Maritimes, making it easier to access and improving care and outcomes. Children with cancer undergo many tests and scans to diagnose and analyze their cancer and monitor their health both during and after treatments. But in the Maritime provinces, this data is often split across different provincial and institutional systems, making it difficult for clinicians to access all of the information about a child with cancer. Integrating this information can revolutionize how clinicians diagnose and monitor childhood cancers, driving advances that build upon the care already provided. With Canadian Cancer Society funding, Dr Victor Martinez is leading a team developing a new platform to integrate data from across the Maritimes, making it easier for clinical care teams to get a more complete picture about children with cancer and their disease. The platform will take test results, medical records and scan pictures and convert them into a shared format that can be easily accessed on an online hub. This project will enable easier access to children's cancer data for researchers and clinicians in the Maritime provinces, improving clinical care and speeding up research to improve outcomes for children with cancer.

Hermann Nabi Laval University	**$110,991** **2024-2026**

Sharing breast cancer data to help researchers improve outcomes

Dr Hermann Nabi is creating a database of information from over 20,000 people with breast cancer in Québec to facilitate better research. Breast cancer outcomes have improved over the past few decades, but advances in treatments and better personalized care are still needed. Analyzing large datasets of clinical and test information from people with breast cancer can often greatly aid research efforts, but making these easily accessible to researchers is a significant challenge. With Canadian Cancer Society funding, Dr Herman Nabi is leading a team to curate and share a large dataset of breast cancers from people in Québec. The records contain information about over 20,000 confirmed cases of breast cancer and a further 40,000 benign breast tumours. The researchers will first update the information with new data and they will make sure the data is ready for analysis. The team will then develop an online portal to store the data and make it easily accessible to other breast cancer researchers. Ultimately, this project could lead to new research using the database, improving outcomes for people with breast cancer.

Petros Pechlivanoglou
The Hospital for Sick Children

$446,767
2024-2027

Understanding the long-term socioeconomic impact of childhood cancer on survivors and their families

Dr Petros Pechlivanoglou is collating and analyzing data to understand which children with cancer and their families experience larger financial, educational and career impacts after a childhood cancer diagnosis. Childhood cancer can be life-changing for a child and their family. Survivors can experience long-term health impacts, affecting their education, social functioning and employment opportunities. Parents and siblings often also experience impacts, both financially and socially. Despite this, there is a lack of robust research as to the socioeconomic impact of childhood cancer on survivors and their families in Canada. With funding from the Canadian Cancer Society, Dr Petros Pechlivanoglou is creating a new national dataset combining decades of data on childhood cancer diagnosis and treatment with information on income, employment and education. The research team will study the impact of a childhood cancer diagnosis on income and employment of parents, as well as the impact of education, income and employment on survivors and their siblings. The researchers will then compare the results with families with children who have not faced a cancer diagnosis. This project will lead to the development of tailored support for survivors and family members who struggle financially after a childhood cancer diagnosis.