

DISTINCTIONS



Maxime Descoteaux received the Relève scientifique 2019 award! Every year, this prize is awarded by the Ministère de l'Économie et de l'Innovation to a person who is 40 years of age or less, who has distinguished him or herself through the excellence of their work and has demonstrated the ability to establish and maintain constructive and long-lasting relationships with research communities.

Organized by *La Tribune*, the Mérite estrien event was held in February 2020. Several Sherbrooke-area recipients were honoured as part of the celebration, including **Kevin Whittingstall** and **Florian Bentzinger**, in the Innovation category, and **Patricia Bourgault**, in the Health/Education category. In January 2020, Dr. **Gilles Boire** also received La Tribune's Mérite estrien of the week award. The feature pays tribute to his entire career as a rheumatologist, which has enabled him to make significant medical advances in the field of Rheumatology.

Florian Bentzinger was a finalist of the *Sartorius & Science Prize for Regenerative Medicine & Cell Therapy* awarded by the Sartorius pharmaceutical company. This award is intended for researchers focused on basic or translational research that advances medical progress in regenerative medicine and cell therapy. The researcher stood out from the other candidates for one of his essays published in the prestigious *Science* magazine featuring an overview of his research.

RESEARCHERS PLAYING A LEADERSHIP ROLE ON THE NATIONAL STAGE

- **Dr. André Carpentier**, Director, Cardiometabolic Health, Diabetes and Obesity Research Network
- **Dr. Frédéric Dallaire**, founder and Scientific Director, Canadian Pediatric Cardiology Research Network; Scientific Director, Canadian Pediatric Cardiology Association
- **Louis Gendron**, Co-director, Quebec Pain Research Network
- **Martin Lepage**, Co-director, Quebec Bio-imaging Network

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CENTRE DE RECHERCHE



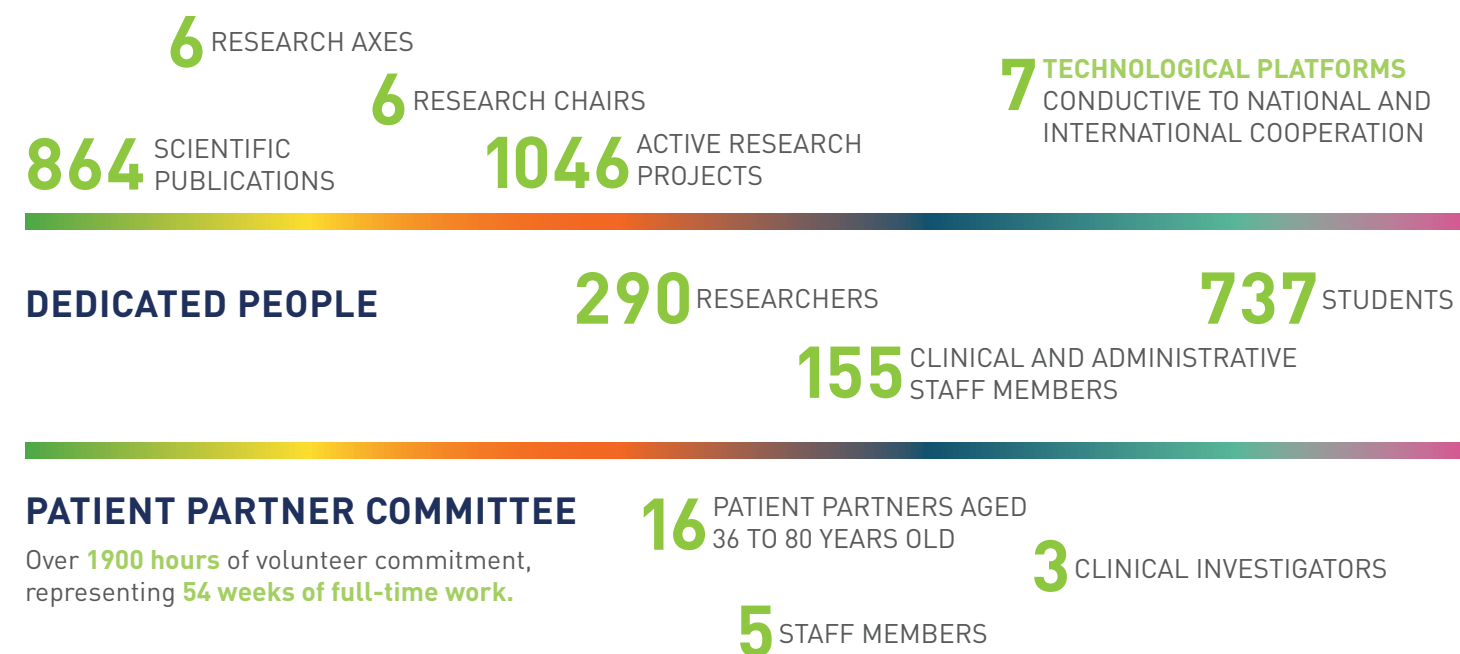
The Centre de recherche du Centre hospitalier universitaire de Sherbrooke (CRCHUS) plays a leadership role in the creation and transfer of knowledge to improve health. To this end, the CRCHUS fosters research excellence by building on its strengths and setting while providing a collaborative environment that is conducive to creativity and partnerships. Research activities supported by the Centre contribute to the emergence of innovative treatments and healthcare services.

EXCELLENCE - BOLDNESS - CREATIVITY

The CRCHUS is a world-class environment for research and innovation that is dynamically integrated into its clinical and university setting. The research centre's achievements have a tangible impact on patients and users.

RESEARCH AT THE CRCHUS

\$42 M annual budget



Our **KNOWLEDGE** brings

HOPE

SINCE **1980**

DISCOVERIES AND INNOVATIONS

CANCER: BIOLOGY, PROGNOSIS AND DIAGNOSIS AXIS

A breakthrough in cancer treatment using mass spectrometry

François-Michel Boisvert's team hopes to identify a marker that will help to understand why some patients with rectal cancer are resistant to radiotherapy and chemotherapy. Using samples from rectal tumours, the researchers extracted the proteins. From the protein content of the tumour samples, the team identified a marker associated with resistance to treatment. Using mass spectrometry, the protein content of tumours is analyzed and then compared to a database. Thus, it is possible to name each protein and measure the quantity of it in the sample. By comparing the proteins identified in treatment-sensitive patients with those found in resistant patients, the team was able to put a name on the proteins responsible for resistance to radiotherapy and chemotherapy, making it possible to identify a specific maker.

DIABETES, OBESITY AND CARDIOVASCULAR COMPLICATIONS AXIS

Daring to alter the insulin molecule

Since its Nobel Prize-winning discovery in 1923, insulin has been considered a pure and noble molecule that cannot be modified. Challenging scientific foundations and paradigms can sometimes lead to major discoveries, and this is what Dr. **Jean-Luc Ardilouze** and **Fernand Gobeil** have dared to do. By adding different vasodilator and anti-inflammatory molecules to the insulin solution, they developed two insulin formulations: One that increases insulin absorption in patients who are obese or have type 2 diabetes and another that helps prolong the duration of catheters for those who use pumps. These new insulin formulations will offer real benefits to people with diabetes.

MEDICAL IMAGING AXIS

Battling cancer thanks to the invention of new tracers

Currently, there are few imaging tools that can track the progression of aggressive forms of breast, prostate or brain cancer. Magnetic resonance imaging (MRI) enables us to see tumours, but does not provide molecular information, which makes it difficult to determine the nature of the metastases. **Brigitte Guérin** and **Fernand Gobeil** have developed new PET (positron emission tomography) imaging radiotracers. These radiotracers bind to tumours or metastases expressing the bradykinin B1 receptor and help to measure the extent of metastases. The researchers validated the stability of the new tracers in animals with tumours. They found that, in addition to acting as effective imaging agents at low doses, at higher doses, the molecules could help treat certain cancers.

INFLAMMATION-PAIN AXIS

Advancing science, one stem cell at a time

Florian Bentzinger is interested in muscular dystrophy, a rare skeletal muscle disease that often affects young children. It is characterized by a loss of the muscle's ability to regenerate itself caused by a dysfunction of the stem cells in muscle tissue. As this neuromuscular disease is incurable, any potential progress is received with great hope. Florian Bentzinger and his team, in collaboration with researchers **Éric Marsault** and **Mannix Auger-Messier** as well as Ubaka Ogbogu from the University of Alberta and Penney Gilbert from the University of Toronto, have developed a new pharmacological approach that stimulates the muscle stem cells, which could help slow the progression of the disease considerably.

HEALTH: POPULATIONS, ORGANIZATIONS, PRACTICES AXIS

Development of a new device to ensure the success of organ donation

Dr. **Frédéric D'Aragon** and his team, which includes **Félix Camirand Lemyre**, among others, are currently working on the creation of a device intended to make the injection of a drug into a donor automatic and autonomous in order to maintain the integrity of the donor's organs. Made possible thanks to a grant of \$250,000 from the New Frontiers in Research Fund, this medical breakthrough would take into account the characteristics of the donor and of the corresponding recipients.

MOTHER-CHILD AXIS

Researchers Camden and Couture put children's development under the microscope

A team led by **Chantal Camden** and **Mélanie Couture** has implemented the P-POP 2-5 research project (Population portrait of the development of children aged 2 to 5 years). The purpose of the project is to document the development of Sherbrooke-area children in order to get a picture of the current situation. The project also seeks to identify children with particular challenges in different spheres of development. A survey filled out by parents helps screen children at risk of developmental delay. The parents of an at-risk child are invited to meet with a healthcare professional to confirm the screening and to get referrals to appropriate resources.

HIGHLIGHTS

New state-of-the-art equipment makes its debut at the CRCHUS

Construction for the installation of a new scanner combining positron emission tomography and X-ray computed tomography (PET-CT) began in the fall of 2019 at the CRCHUS. The space has been redesigned and enlarged to make room for new examination rooms. This equipment will be used namely by Dr. **André Carpentier's** team as well as by several other CRCHUS researchers. Dr. Carpentier will head a research project that enables patients with type 2 diabetes to know if they are at risk of developing heart failure or complications from their disease.

Optimizing care for patients with prostate cancer

Through their research, **Brigitte Guérin** and her team aim to offer more effective and customized treatments to patients with prostate cancer. In 2019, they set up the 3TMPO multicentre clinical study thanks to the large-scale production of gallium (⁶⁸Ga) by cyclotron. Gallium is used for the preparation of two PET tracers that will improve characterization of metastatic prostate cancer, thus enabling better treatment. Coordinated by the CRCHUS with support from the Clinical and Epidemiological Research Unit (URCE), this multicentre project is currently underway in five centres across Quebec. Two international patents resulting from this project have been filed.

Preventing alcohol abuse among young people

On Halloween, hospital admissions for alcohol abuse-related medical emergencies are frequent and serious among young adults, notes Dr. **Claude Cyr**. Through prevention, awareness and education, Dr. Cyr hopes to reduce the harm associated with excessive alcohol consumption among young people. Based on the results of his research, which paint a clear picture of alcohol consumption in Sherbrooke, several local players have joined forces to actively contribute to the well-being of young people. Partners have taken concrete actions, such as the *Garde ça l'un!* (Keep it Fun!) campaign, which reminds young people that you don't have to binge drink to have fun at a party.

OUTREACH

Dr. **Marie-France Langlois** and Dr. **Jean-Patrice Baillargeon** published an article in the May-June 2019 edition of the Obesity Research & Clinical Practice journal entitled [*Male partners of subfertile couples in which the spouse is obese display adverse weight and lifestyle associated with reduced sperm quality*](#). This is the first study to focus on the partners of spouses who are obese and visiting a fertility clinic. The team showed that it is relevant to provide men with the tools to adopt a healthy lifestyle in order to improve their health and reproductive potential, as well as the couple's fertility.

An article on medical imaging and cyclotron-based production of technetium at the CRCHUS was published in [*Québec sciences*](#) magazine. **Brigitte Guérin** and Dr. **Éric Turcotte** discuss the innovative medical imaging facilities that enable the Centre to offer unparalleled services in the field of imaging in northeastern North America.

In June 2019, as part of the Sherbrooke RBC Half Marathon, the Colorectal Cancer Canada Giant Colon Tour made a stop at Jacques-Cartier Park. The public was invited to walk through the colon, which is 2.5 metres high and 12 metres long, and to chat with patient partners about the importance of citizens' input in research. [*Ici Radio-Canada*](#) was also on site to talk to Dr. **Nathalie McFadden** and **Jean-François Beaulieu** about colorectal cancer and other digestive system diseases such as Crohn's disease and diverticulitis.

SUPPORTING RESEARCH DEVELOPMENT

Dr. **François Lamontagne** is Co-Director of the Canadian Sepsis Research Network, which is funded by the Canadian Institutes of Health Research (CIHR) and the Fonds de recherche du Québec (\$5.8M). This is a new national research network aimed at improving the treatment and recovery of patients with a severe infection known as sepsis. This network will study various promising treatments in patients with sepsis and build a database of evidence-based tools to provide information to the public and to healthcare professionals about the prevention, diagnosis and management of sepsis.

The CIHR launched a project grant competition in February 2020 for projects studying COVID-19. **Richard Leduc** and his team received \$865,000 in funding over two years to research the emergence of this new virus.

The Ministère de l'Économie et de l'Innovation awarded \$585,666 to the CRCHUS to broaden its range of services by offering innovative radiotracers produced according to Health Canada standards, for both research and clinical use. **Brigitte Guérin** is responsible for bringing this project to completion. These radiotracers can even be shipped to external collaborators.