

Academia-industry partnership creates blueprint for collaboration to develop innovative new cancer treatment

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Canadians and patients around the world with the misfortune to be diagnosed with one of the deadliest forms of leukemia may soon be able to thank a multi-faceted collaboration in Montreal's biopharmaceutical cluster for giving them new hope against their blood cancer.

Pharmascience Inc. and Université de Montréal today announced the signing of an agreement which formalizes and brings to the next level of activity a collaboration that demonstrates the value of academic research, [public institutions](#), patient disease groups and the pharmaceutical industry working together to bring new hope to patients. The agreement was coordinated by the university's Institute for Research in Immunology and Cancer – Commercialization of Research (IRICoR).

The result could be a new use for an old drug, and new hope for people with certain types of [acute myeloid leukemia](#) (AML), a [blood cancer](#) which today has very few treatment options and only a 10 per cent five-year survival rate. It is a story that demonstrates very clearly the benefits a multi-faceted biopharmaceutical cluster such as the one which exists in Greater Montreal can bring together to make a very complex undertaking possible.

It starts with Dr. Katherine Borden, a Montreal-born research scientist who, after 20 years of education and research in the United States and United Kingdom, was enticed by the Montreal research environment to

return in 2004 as the Canada Research Chair in the Molecular Biology of the [Cell Nucleus](#). She is a Professor in the Department of Pathology and [Cell Biology](#) in the Faculty of Medicine at Université de Montréal, as well as a Principal Investigator for the university's Institute for Research in Immunology and Cancer (IRIC).

Answering fundamental cancer question

Dr. Borden and her research team are focused on answering one of the fundamental questions in [cancer biology](#): how do normal cells become transformed into [cancer cells](#), particularly leukemia? Their research focuses on a particular protein, eIF4E, and how its dysregulation leads to cells becoming cancerous, resulting in leukemia. Their understanding of this process led them to believe that an old anti-viral drug, ribavirin, might target eIF4E and result in remission for some patients with AML.

To study this theory, Dr. Borden enlisted the support of The Leukemia & Lymphoma Society in the U.S., a patient support group dedicated to fighting blood cancers. Their funding permitted a small initial clinical study in collaboration with Drs. Wilson Miller and Sarit Assouline at the Jewish General Hospital in Montreal, using drug purchased in the United States, but for which supply was both expensive and unreliable. The study, published in 2009, showed promise for ribavirin in AML. Even though all 11 patients were very sick and had already failed other possible treatments, nine improved in a matter of months, without debilitating or dangerous side effects. Some patients went into remission, a previously unheard of result, and others had dramatic drops in the number of leukemia cells.

Pharmascience makes and donates study drug

Enter Montreal's Pharmascience Inc., now Canada's 10th largest

pharmaceutical company and whose generic drug division is Canada's third largest. The company was co-founded in 1983 by Université de Montréal-trained pharmacist Morris Goodman, who became familiar with ribavirin in 1971 when he sold his then pharmaceutical business to the company that was developing ribavirin. When he met Dr. Borden and learned of her work at a Université de Montréal event honouring his classmate Jean Coutu and his wife Marcelle for a donation to IRIC, he offered to have Pharmascience manufacture ribavirin free of charge at its Montreal plant specifically for her study. That supply permitted a second study to take place using ribavirin in combination with another therapy, but also led to the growth of further collaboration, resulting in the formal agreement just completed.

Pharmascience also assisted Dr. Borden's team by donating the help of three analytical chemists from the company's Aegea Therapeutics research team. One of the major issues facing AML patients on ribavirin is that they develop resistance to the drug over time. The Aegea chemists' work showed that ribavirin was being modified in a particular way in these patients, making it ineffective. This finding allowed Dr. Borden's team to develop a way to use another drug to, they hope, slow or stop this resistance process.

This understanding is slated to be implemented as a new clinical trial in the near future using a new supply of ribavirin produced and donated by Pharmascience. A further new study planned for the next year will examine ribavirin in combination with another drug as a first treatment in newly diagnosed AML patients.

The Leukemia & Lymphoma Society in the U.S. continues to be a vital partner in funding the administration of the trials, while another Montreal institution, the Jewish General Hospital, continues as the major Canadian study site. American research sites may also be added for the new studies.

Framework for possible commercialization

Université de Montréal's IRICoR was established to assist university researchers in the difficult task of commercializing their discoveries in immunology and cancer. IRICoR played a major role in establishing the partnership agreement between Université de Montréal and Pharmascience which moves the process for ribavirin an important step closer. The agreement lays out the framework for how Pharmascience would commercialize ribavirin for eventual use in AML, and potentially other cancers since eIF4E is elevated in about 30 per cent of cancers, benefiting both the company and the university. Pharmascience is also assisting the project by providing the intellectual property expertise to ensure the discoveries have proper protection. Applications for two patents have already been filed.

"IRICoR and Université de Montréal are very pleased with the tremendous collaboration we have had with Pharmascience and see it as a model for possible other collaborations in the future," said Michel Bouvier, Chief Executive Officer of IRICoR. "This project demonstrates the immense mutual benefits of having available in Montreal all the players necessary to permit the type of collaborations that are vital today to bring the benefits of new discoveries to patients."

"This collaboration is a demonstration of the values Pharmascience has brought to its work since it was founded 30 years ago," said David Goodman, Chief Executive Officer of Pharmascience. "It demonstrates our commitments to innovation, to helping patients, to furthering research, particularly in cancer, and to collaborating with the local institutions that serve our community so well."

Dr. Borden is equally enthusiastic about the partnership. "Every player is vital to us being able to transform our work from mere ideas into real benefits for patients," she said. "We are immensely grateful for the

opportunity that is being created by the varied but vital contributions of everyone involved."

Provided by University of Montreal

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