

Cells programmed to cure and even prevent cancer

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The Institute for Research in Immunology and Cancer (IRIC) of the Université de Montréal announced the launch of the very first ribonucleic acid (RNA) engineering laboratory in Canada.

Led by François Major, Principal Investigator in bioinformatics at IRIC, with the collaboration of Gerardo Ferbeyre, [biochemistry](#) researcher with the Faculty of Medicine of the Université de Montréal, the team is seeking to control the behaviour of RNAs, which is at the core of the cell's programming, in order to cure and even prevent [cancer](#). The new laboratory is housed on the third floor of IRIC's Marcelle-Coutu Pavillion.

RNAs play an essential role in the cell by ensuring the transmission and execution of the instructions encoded in the DNA program. François Major and his team have already successfully tested microRNAs they custom made to block the proliferation of prostate cancer cells. They are also looking forward to eventually designing RNAs capable of detecting the conditions leading to the development of the disease as soon as they arise and reacting instantly to correct the situation.

"The results we have obtained so far in the laboratory are very promising in terms of personalized cancer therapeutics. We are also planning to design microRNAs capable of protecting the cell, acting similarly to antivirus software that identifies and eliminates attacks before they can cause damage to the computer," François Major explains. "This would be a tremendous weapon against cancer, wouldn't it?"

With this new facility, Dr. Major, assisted by Dr. Ferbeyre and his team, will be able to rapidly test his informatics models in situ based on the data obtained from their experiments. They will thus perfect their computer models on the spot. The research approach proposed, integrating expertise in biochemistry, molecular biology and informatics in one team, will optimize the laboratory's research capabilities.

"It is rare for a computer scientist to direct his own experiments in a wet laboratory," explains Dr. Guy Sauvageau, Chief Executive Officer and Scientific Director of IRIC. "Informatics generally serves as a tool or a means to obtain results in biology, and not the other way around. However, François Major's research projects and the integrated approach he proposes to accomplish them are very promising, which explains the enthusiasm of the funding agencies and our industrial partners for IRIC's new [RNA](#) Engineering Research Unit. Dr. Major is a pioneer in his field and the creation of this new team is the latest example of his exceptional innovative spirit."

In addition to advancing cancer research, the synergy generated by the laboratory's integrated approach will also benefit students who will have the unique opportunity to simultaneously use cutting-edge techniques in informatics and biochemistry. Such cross-disciplinary learning will contribute to their competitiveness on the job market.

Provided by University of Montreal

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