

Identifying Safer, More Effective Molecular Drug Candidates

McGill University

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In both the human body and the field of molecular pharmacology, proteins known as G protein-coupled receptors (GPCRs) are superstars.

When naturally occurring molecules (called ligands) bind to GPCRs, the complex hubs prompt much of the cellular activity in the body, including metabolism and brain function, by activating signalling pathways. Different ligands change the shape of GPCRs, which in turn, alters the signals sent.

“*Drug makers exploit this cell function by engineering artificial ligands that will bind to GPCRs and selectively activate signalling pathways to achieve a specific therapeutic response. However, scientists haven’t come close to tapping the potential therapies available through ligand-based signalling.*”

To help scientists predict the efficacy and side effects of candidate molecules, Michel Bouvier, Ph.D., and Graciela Pineyro, M.D., Ph.D., from the Université de Montréal (UdeM); Stéphane Laporte, Ph.D., and Terry Hebert of McGill University; and Richard LeDuc, Ph.D., from Université de Sherbrooke developed a set of biological tools called GPCR biosensor technology. The research team received a multiyear grant from the Quebec Consortium for Drug Discovery to develop the platform.

In 2013, UdeM's Institute for Research in Immunology and Cancer – Commercialization of Research (IRICoR) negotiated a partnership among McGill, UdeM and Domain Therapeutics, exclusively licensing the GPCR biosensor technology to the French biotech company. As part of the agreement, the company established a Montreal-based subsidiary that provides GPCR analysis to a wide range of clients from both academia and the biopharmaceutical industry.

Today, Domain Therapeutics is identifying and developing new drug candidates for improved treatments for the central nervous system and oncology, in addition to providing access to its technologies through research and collaborative agreements.

From initial project funding to the inter-university partnership and a committed industry partner, the development of the GPCR biosensor and its commercialization are a testament to what can be achieved through collaboration.

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