PRESS RELEASE

For immediate release

Discovery of a new molecular mechanism that guides visual nerves towards the brain

Montréal, January 7, 2010 – The laboratory of Dr. Frédéric Charron, a researcher at the Institut de recherches cliniques de Montréal (IRCM), has discovered a new molecular mechanism that permits the guidance of visual nerves towards the brain. Their findings have been published in the current issue of the *Journal of Neuroscience*. The research was conducted in collaboration with Dr. Tomomi Shimogori from the RIKEN Brain Science Institute, in Japan. Pierre Fabre, a doctoral student in Dr. Charron's research unit, is the article's first author.

To correctly establish nervous circuits, attractive and repulsive molecules are required to guide growing axons to their appropriate targets. One such molecule is Sonic Hedgehog (Shh). "Using genetic evidence and *in utero* manipulations in mice, we were able to demonstrate that the Sonic Hedgehog (Shh) molecular pathway is required for the guidance of retinal axons within the optic chiasm," specified Pierre Fabre. This guidance, which acts through repulsion, relies on the Boc receptor, which becomes therefore a prime target for the development of therapies that could stimulate axonal growth after injury or in neurodegenerative disorders.

Moreover, the authors have shed new light on the molecular mechanisms involved in the formation of the visual system. The optic chiasm is the crossroad of optic nerves stemming from both eyes and allows the brain to integrate binocular visual information, a crucial process for establishing 3D vision. "By showing that Boc and Shh play an important role in this neurobiological development process, we have identified a new molecular pathway required in the formation of the visual system," added Dr. Charron.

"CIHR is proud to support research such as Dr. Charron's, which will improve our understanding of visual development," says Dr. Anthony Phillips, Scientific Director of the Canadian Institutes of Health Research (CIHR) Institute of Neurosciences, Mental Health and Addiction. "The discovery of the new molecular mechanism will pave the way for research into neurodegenerative disorders and, eventually, treatment."

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Fabre was also awarded scholarships from the Université de Montréal and the IRCM.

References for this article are available at:
http://www.jneurosci.org/cgi/content/abstract/30/1/266

Dr. Frédéric Charron is Assistant Research Professor IRCM and Director of the Molecular Biology of Neural Development Research Unit at the IRCM. Dr. Charron is also Assistant Professor in the Department of Medicine at Université de Montréal, member of the Centre of Excellence in Neuromics of Université de Montréal (CENUM), member of the McGill Program in Neuroengineering, and Adjunct Professor in the Faculty of Medicine at McGill University. He is a recipient of the Peter Lougheed Medical Research Foundation Award and a New Investigator of the Canadian Institutes of Health Research (CIHR).

Established in 1967, the IRCM (www.ircm.qc.ca) now has 36 research units specialized in areas as diverse as immunity and viral infections, cardiovascular and metabolic diseases, cancer, neurobiology and development, systems biology and medicinal chemistry, clinical research and bioethics. It has a staff of more than 450 people. The IRCM is an independent institution, affiliated with the Université de Montréal and its clinic is associated to the Centre hospitalier de l'Université de Montréal (CHUM). It has built, over the years, a close collaboration with McGill University.

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