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Scientists identify molecule that links both sides of the brain

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A Queensland Brain Institute-led team has identified a molecule that plays a key role in establishing the major nerve connections between each side of the adult brain.

QBI neural migration laboratory head, Associate Professor Helen Cooper said her group's research provided new clues regarding development of the corpus callosum, the main connecting nerve tract that shuttles information between the left and right hemispheres of our adult brain.

Using a mouse model, neuroscientists at The University of Queensland – working with Associate Professor Steven Stacker and his team at the Ludwig Institute for Cancer Research in Melbourne – have identified a molecule that helps control development of the corpus callosum.

The corpus callosum has millions of individual nerve fibres. If these fibres fail to reach their correct targets in the opposite hemisphere, people can suffer from epilepsy, and experience some degree of mental retardation.

“Our study is the first to identify a growth molecule that guides young nerves away from the corpus callosum and towards their targets in the opposite hemisphere,” Dr Cooper said.

“We have shown that the Ryk receptor molecule facilitates the targeting of individual nerve fibres.

“This process is critical for the transmission of sensory information effectively throughout the adult brain.”

These findings are expected to have long-term implications for development of treatments for several forms of mental impairment and epilepsy.

A QBI-led scientific paper outlining functions of the Ryk receptor molecule is published in the May 24 edition of The Journal of Neuroscience.

QBI has been studying a variety of molecular guidance systems which play pivotal roles in the guidance of nerve fibres and newly born neurons throughout the developing central nervous system.

Established in 2003, QBI is dedicated to understanding the molecular basis of brain function and applying this knowledge to the development of new therapeutics to treat brain and mental health disorders.

QBI was formed as part of the Queensland Government's Smart State Initiative, building on a long history of neuroscience at The University of Queensland.

Source: University of Queensland