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New insights made into cellular signalling pathway linked to cancer and other diseases

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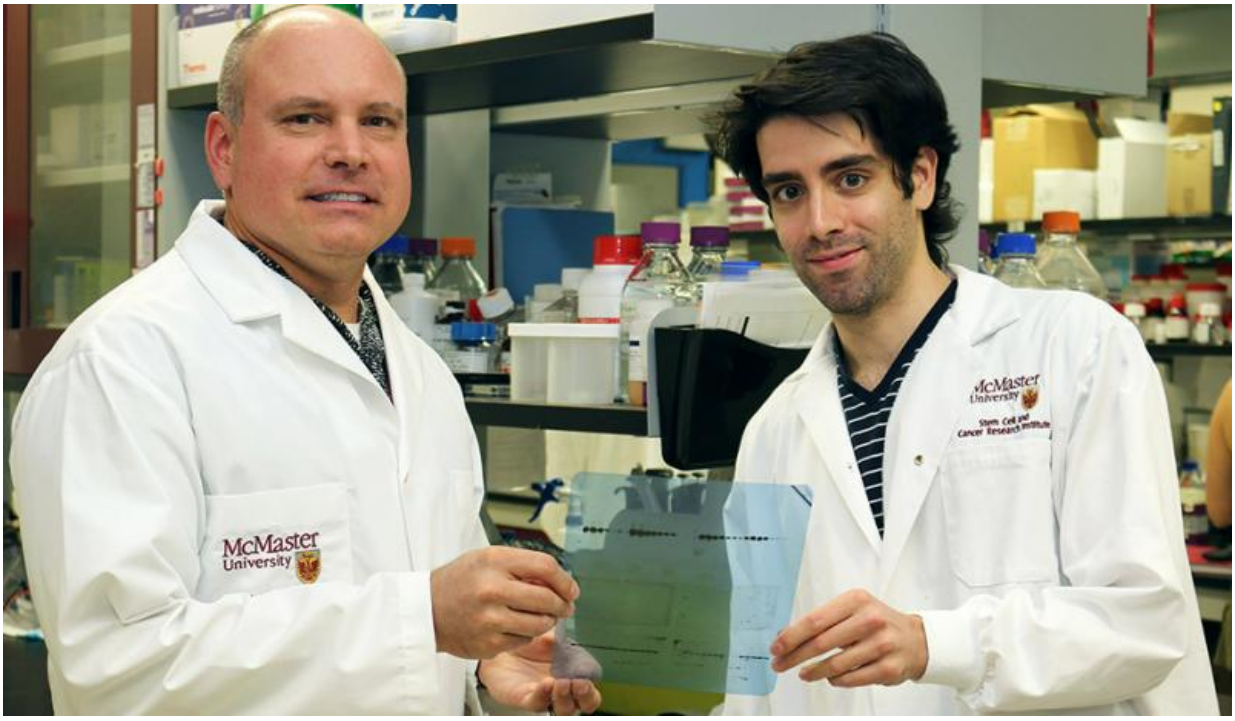

Bradley Doble, left, principal investigator with the McMaster Stem Cell and Cancer Research Institute, and Steven Moreira, PhD student in biochemistry and biomedical sciences. Credit: Tina Depko

Researchers at McMaster University have learned more about the regulation of a cellular signalling pathway involved in the development of several types of cancer, including colon cancer.

The research provides insight into how the pathway – called the Wnt signalling pathway – works in normal stem cells, which helps determine what promotes disease states. The study was recently published in the journal *Cell Reports*.

"The Wnt signalling pathway is required for proper embryonic development and stem cell function," said Bradley Doble, principal investigator with the McMaster Stem Cell and Cancer Research Institute and associate professor of biochemistry and biomedical sciences.

"The Wnt pathway is frequently disrupted in a variety of human diseases including numerous types of cancer, particularly colon cancer, Type 2 diabetes and osteoporosis. This basic research provides guidance for the development of future therapeutic strategies."

Doble noted the team utilized gene knockout, where one of an organism's genes is made inoperative, in the study. To achieve this, researchers used technology called Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR). This enables the permanent modification of genes in organisms.

"Normally people knock out one or two genes, but we knocked out all four downstream mediators of Wnt signalling by using CRISPR-mediated gene editing," said Doble.

Steven Moreira, a PhD student in biochemistry and biomedical sciences, is the first author on the paper. Moreira conducted the research in the Doble's lab in the McMaster Stem Cell and Cancer Research Institute.

This paper was also recently presented at a conference in Stowe, Vermont. It will be highlighted in an upcoming issue of *Bioessays*. Additional researchers contributed from McMaster University, University of Ottawa and University of Guelph.

More information: Steven Moreira et al. A Single TCF Transcription Factor, Regardless of Its Activation Capacity, Is Sufficient for Effective Trilineage Differentiation of ESCs, *Cell Reports* (2017). DOI: 10.1016/j.celrep.2017.08.043