

Turning science fiction into science fact

April 29 2016, by Lauren Flynn



Many Canadians are unaware stem cells were first discovered in Ontario. This entire field of science began right here, more than 50 years ago, and our province's researchers – including many here at Western – are still consistently ranked among the world's best, including PhD Candidate Anna Kornmuller. Paul Mayne // Western News

Joints that can be reconstructed. New tissues or entire organs to replace those damaged in injury or disease. A transplant of healthy beta cells so

a diabetic never needs an insulin injection again.

It sounds a bit like science fiction, but these are among the problems Western's stem cell researchers are working on and may be a reality in the very near future. The Western stem cell community is growing and currently 17 Western labs and their trainees are members of the Ontario Institute of Regenerative Medicine (OIRM). These members are engaged in a wide range of research activities, from understanding the earliest steps in embryonic development, to harnessing the power of adult [stem cells](#) to direct tissue repair or replacement.

Dr. David Hess has more than a professional interest in stem cells.

"As a teen," he said, "I underwent [bone marrow transplantation](#) to treat severe aplastic anemia, a disease where stem cells within the bone marrow fail to produce red blood cells that carry oxygen to our tissues, leukocytes that fight infection, and platelets involved in blood coagulation."

So, why stem cells?

Well, for one, stem cells are rather captivating entities. They are captivating in their ability to create perfect replicas of themselves and also create more specific cells the body needs for survival every day. Roughly two million [red blood cells](#) are produced every second. The lining of your intestine, probably the most hostile environment in your body, is completely regenerated by stem cells every three days. However, stem cells have also been subject to more than their fair share of controversy in the form of ethical debate and, more recently, hype as the 'magic bullet' to cure all ails.

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Recently, two Western research teams were awarded New Ideas Grants from the OIRM to explore promising and emergent areas of study. One, led by Dean Betts, is looking at how cell metabolism could improve efficiency in how we create stem cells for study and possible therapy. The second, led by Zia Khan, is studying hemangiomas (benign tumours in the skin) to learn how blood vessels develop so this knowledge may one day be applied to repair and regenerate vessels damaged in diseases such as diabetes. Khan's team is one of only three labs in North America with a bank of hemangioma tissue available for study.

Apart from our proud legacy and the fascinating biology of stem cells, there are good reasons why there is increasing interest in this promising field. Our research is directly relevant to numerous diseases, including diabetes, vascular disease, musculoskeletal disorders, wound healing and cancer. In terms of motivation, it is crucial to consider the costs of health care in this province – according to OIRM, the direct and indirect costs associated with degenerative disease alone are estimated to be more than \$75 billion per year, and an aging population is placing greater burdens on our health-care system, our economy and the families who support those with significant health needs. Reducing these costs will have a profound impact on our quality of life, and stem cells represent one of the most promising avenues to transform the health-care field.

Looking at economic growth, the [regenerative medicine](#) industry globally was valued at \$19 billion in 2015 and is one of the fastest growing sectors. Ontario is dedicated to recruiting new companies, fostering start-ups, building a robust cell manufacturing infrastructure, and making Ontario cities attractive places to conduct stem cell clinical trials. With Western's emerging strengths in [stem cell research](#), London could be a home for this growth, contributing to new job creation and

cutting-edge medical advances.

Provided by University of Western Ontario

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