



# REGENERATIVE MEDICINE IN CANADA

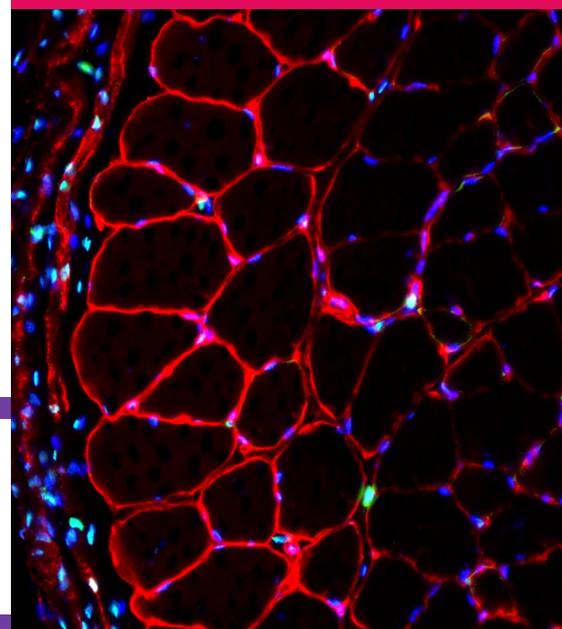
**Everywhere we look today — online and in the media, among patient groups, families and health care providers — stem cells and regenerative medicine (RM) have become synonymous with the promise of better health as people seek-out new therapies for what ails them.**

**RM is changing the game by unlocking leading-edge treatments for diseases such as, type 1 diabetes, retinal degeneration, muscular dystrophies, lung and heart disease, as well as for neurodegenerative diseases such as Parkinson's and multiple sclerosis.**

Traditionally powered by stem cells, RM focuses on replacing, repairing, or regenerating human cells, tissues and organs. It is considered by investors, economists and health policy experts to be the next frontier of modern medicine. The power of RM is in its potential to halt or reverse disease instead of simply alleviating symptoms. In some cases, RM may even have the potential of offering a cure.

*Stem cells are the building blocks of the human body. They can become any cell type and make copies of themselves. As a result, they are fueling the field of regenerative medicine.*

**The Stem Cell Network (SCN)** is a Canadian not-for-profit that supports stem cell and regenerative medicine research; training the next generation of highly qualified personnel; and knowledge mobilization and transfer of stem cell and regenerative medicine research. From the lab to the clinic, SCN's goal is to power life-saving therapies and technologies through regenerative medicine research for the benefit of all.

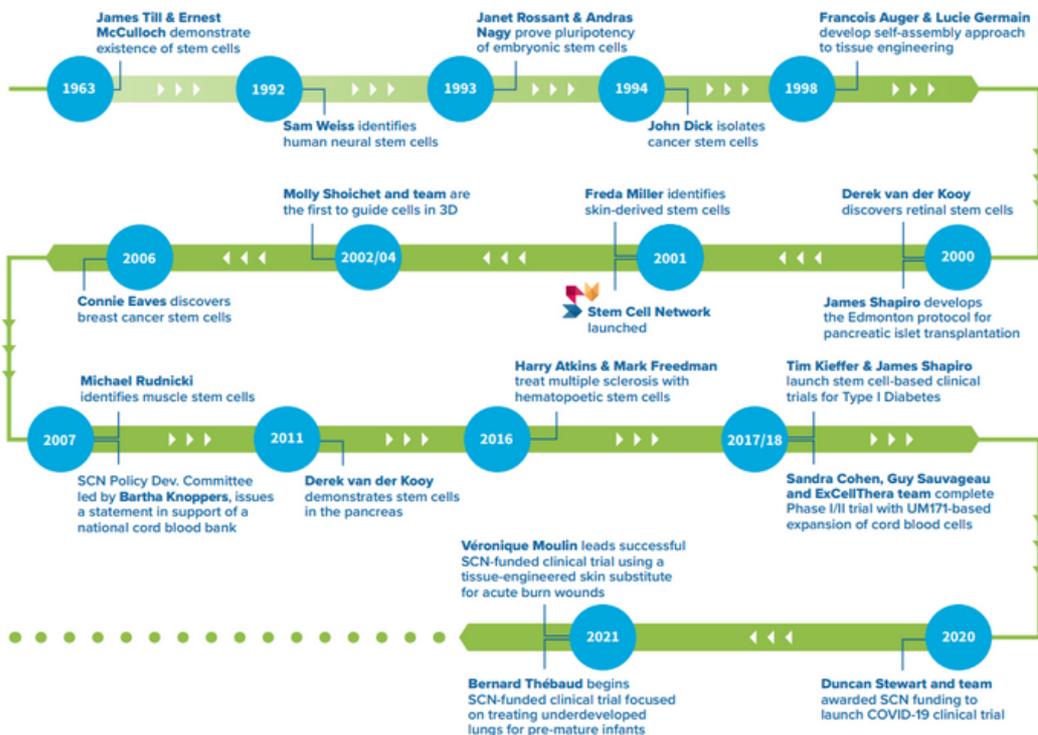


# Tiny Cells, Huge Potential

In an expert panel report on regenerative medicine by the Council of Canadian Academies, it was noted that “stem cell therapies have the potential to revolutionize how healthcare systems treat disease.” Prior to the pandemic, the Chronic Disease Prevention Alliance of Canada reported, “the burden of chronic and degenerative disease costs Canada over \$190B annually, with \$122B in indirect income and productivity losses, and \$68B in health care costs. The direct cost of chronic diseases accounts for about 58% of the annual health care spending in our country.” This is simply not sustainable. Today, as we look beyond the pandemic and consider the state of our health care system, it is time to ask how regenerative medicine can support our country in providing leading-edge therapies and technologies that will revolutionize health care and offer patients and their families world class personalized therapies.

# Better Health Starts with Research

For over 20 years, Canada’s Stem Cell Network (SCN), has empowered leading researchers and trainees from coast to coast, while collaborating with charity, industry and government partners to drive the field of regenerative medicine forward. Canada has been a world leader in RM from the start. From the definitive confirmation of stem cells by Drs. Till and McCulloch in the 1960s, Canadian researchers have continued to make significant contributions globally. SCN has supported hundreds of research teams and thousands of trainees as they have worked to translate discoveries into the therapeutics of tomorrow.



“Stem cell therapies have the potential to revolutionize how healthcare systems treat disease.”

CCA Expert Panel Report



In Canada, \$190B is spent annually by the health care system on chronic disease, with expenditures expected to outpace economic growth.

# \$190B

Today, SCN is powering clinical trials that are testing new cell-based therapies and technologies that address illnesses such as blood cancers, sepsis, type 1 diabetes, as well as lung development in premature babies and wound repair for burn patients. This is just the beginning for this highly promising field that is currently moving forward approximately 100 clinical trials.

## Unlocking Canada's Economic Potential

The Alliance for Regenerative Medicine has reported the cell and gene therapy sector completed another record-breaking year with \$23.1B raised in 2021—a 16% increase from 2020. In Canada, the Institute for Health Economics conservatively estimates that if Canada were to capture only 5% of the projected \$77B USD market, this could represent over \$5B CAD in potential growth, which in turn translates to over 6,000 jobs.

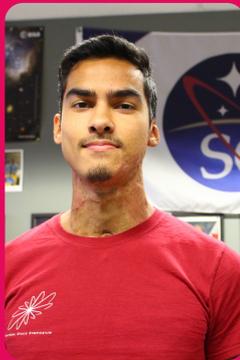
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**\$5B**  
**6,000 Jobs**

## Clinical Trials Offering Hope for the Future



**Tyler Rabey** was not yet 25 when he was diagnosed with an aggressive form of leukemia that seemed to defy all standard treatments. He was enrolled in an SCN-funded trial that used stem cells expanded from umbilical cord blood using a technology referred to as UM171. It changed his prognosis and the trajectory of his health. Today he's in remission, graduated university and has launched his own business.



**Kevin Bolusi** was a teenager when he suffered severe burns to 75% of his body. After arriving at the hospital, he was placed into a coma and his parents consented to his participation in an SCN-funded clinical trial. The research was testing an autologous tissue-engineered skin substitute. The treatment is faster than skin grafting, and the risk of rejection is much lower due to the use of personalized skin cells. Kevin's recovery has been remarkable, and he is back at Concordia studying aerospace engineering.



**Jennifer Molson** was a 21-year-old aspiring police officer when she was diagnosed with aggressive multiple sclerosis. Within five years, Jennifer was unable to manage everyday tasks, including cutting her food and taking a shower. After multiple failed therapies, she took part in an innovative clinical trial that took her own stem cells, purified and fortified them, and after extreme chemotherapy to knock out her immune system, returned the stem cells to her body to rebuild a new, disease-free immune system. Today, with all traces of the disease eradicated, Jennifer enjoys an active life with her family.

From bench to bedside SCN is working for Canadians to develop the innovative therapies that will change the trajectory of disease and improve health for all people. Tyler, Kevin and Jennifer represent just a few of the people who have participated in an SCN clinical trial and seen their health returned. With SCN's sustained support of clinical trials we can build a healthier, stronger Canada.

There are more than 60 companies in Canada with a regenerative medicine focus, including biotechs such as Morphocell Technologies, BlueRock Therapeutics, ExCellThera, STEMCELL Technologies, Notch Therapeutics, Satellos Bioscience and Mesentech. Combined, these companies are employing thousands and bringing forward cell and gene therapies to address critically important health challenges including heart disease, liver failure and muscle regeneration.

The Innovation Economy Council reports that private investors are pouring billions of dollars into Canadian life science companies. **In fact, in 2019 and 2020, the sector raised \$2B in venture capital and \$5B in public equity.** These investment numbers will only continue to grow over the course of this decade and well into the next.

Through company growth, globally competitive talent, and innovative products developed in Canada and scaled for the global market, RM and the broader life sciences sector will be a significant economic player and will be one of our nation's strongest knowledge producing sectors.

## Where to Next?

Powered by two decades of success, SCN is a central driver of Canada's life sciences ecosystem, and the only national network with a proven track record for continued excellence and impact in regenerative medicine.

With its three-year **strategic plan, Ignite**, SCN is pushing forward in building a more robust research and training ecosystem that will fuel next generation science, build global partnerships, and train the scientific and business leaders of tomorrow. SCN is now planning out to 2030 with an ambitious strategy that has already led to partnership commitments valued at over \$100M. Together with its partners and continued federal support, SCN will deploy nearly \$200M into Canada's regenerative medicine sector that will:

- **Advance** RM research to clinical translation through support of hundreds of multi-disciplinary research teams across the country
- **Expand** RM clinical trials activity that will benefit hundreds of patients from coast to coast to coast
- **Accelerate** growth in Canada's RM sector by training the next generation of globally competitive talent

**By 2030, Canadians can expect that SCN will have fueled leading-edge, made-in-Canada therapies and technologies that will not only provide economic benefits but offer leading-edge, life changing health solutions.**

## Canadian Women Leading in Regenerative Medicine



**Dr. Stephanie Willerth**, from the University of Victoria is the co-founder of **Axolotl Biosciences**. This emerging biotech company has developed a powerful bio-ink, used in the 3D printing of human tissue models to advance the field of tissue engineering and regenerative medicine.

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**\$200M**