



Tender
Loving
Research

Regenerative Medicine

The world turns to The Ottawa Hospital for answers to its most complex healthcare challenges.

Research breakthroughs at The Ottawa Hospital mean better care and life-saving medicine. Everyday we look beyond the laboratory and see the results of what we do – lives saved, better care, suffering stopped. We relentlessly pursue answers to the world's most challenging health care problems and we do so with knowledge, experience and care. Our research is fuelled by a passion to create made-in-Ottawa solutions for a healthier world.

**Join our campaign and let's give the world
a little Tender Loving Research.**



DR. HARRY ATKINS
Physician and Scientist

Regenerative medicine delivers 21st century therapies

**Can human stem cells be harnessed to rebuild the heart after a heart attack?
Restore vision to the blind? Reconnect a broken spinal cord?**

This is the promise of regenerative medicine and the life's work of more than 100 scientists, clinical investigators, trainees and staff at the Ottawa Hospital Research Institute, including the Sprott Centre for Stem Cell Research and the Sinclair Centre for Regenerative Medicine. They form a multidisciplinary team focused on unlocking the secrets of stem cells and harnessing their regenerative power to:

- Repair the heart and blood vessels after a heart attack
- Develop new therapies for auto-immune diseases, such as multiple sclerosis, Crohn's disease and arthritis



MADE IN OTTAWA RESEARCH FOR A HEALTHIER WORLD

THE OTTAWA HOSPITAL FOUNDATION
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CHARITABLE REGISTRATION NO.: 86904 2747 RR0001

- Regenerate damaged spinal cords
- Build stronger muscles in children with devastating diseases, such as muscular dystrophy, and in adults with age- or cancer-related muscle wasting
- Regenerate brain tissue after a stroke
- Repair damaged insulin-producing tissue in people with diabetes
- Understand how cancer develops and create new personalized treatments
- Heal tissues damaged by severe infectious diseases

That's why we're raising **\$15 million** to expand the regenerative medicine research team and facilities. We will:

- Increase support for research and attract top recruits from around the world
- Retrofit research facilities to ensure researchers have the latest tools to compete and work with top global research centres
- Renovate facilities for manufacturing stem cell therapies for patient clinical trials
- Purchase new equipment to purify, visualize and study stem cells, and conduct clinical trials
- Establish research chairs in areas such as Spinal Cord and Brain Regeneration

"Stem cells are the building blocks of the human body, and our ability to regenerate cells means we are using them to repair, restore and rebuild damaged tissue and organs. Regenerative medicine is the new frontier in medicine, and The Ottawa Hospital is among its pioneers."

*Dr. Michael Rudnicki,
Director, Regenerative
Medicine Program, and
Director, Sprott Centre
for Stem Cell Research,
Ottawa Hospital
Research Institute*

Investing in made-in-Ottawa therapies

Scientists at the Ottawa Hospital Research Institute are known around the world for discovering novel kinds of stem cells and deciphering how they work, but they are also increasingly known for translating their research into new personalized therapies for patients.

In the next few years, our researchers will accelerate these activities and initiate a number of world-first clinical trials in patients.

Regenerative medicine at The Ottawa Hospital

Patients around the world are benefiting every day; tomorrow holds even greater promise

Researchers at the Ottawa Hospital Research Institute are using regenerative medicine to develop made-in-Ottawa personalized therapies and treatments.

- Dr. Duncan Stewart has launched the world's first clinical trial of an engineered stem cell therapy for heart attack. He has also initiated a clinical trial of a similar therapy for pulmonary hypertension, a rare but deadly lung condition that primarily affects young women. In both cases, stem cells are taken from the patient's blood, re-engineered in the laboratory to be more powerful and injected back into the body, where they help repair and regenerate damaged tissue.
- Dr. Michael Rudnicki was the first to discover stem cells in adult muscle tissue, and he has also identified a protein that can stimulate these cells to regenerate and repair damaged muscles. This protein is now in the final round of laboratory testing and could enter into clinical trials in patients with muscle diseases within a few years. Dr. Rudnicki is also developing a similar protein-based stem cell therapy to repair damaged insulin-producing tissue in people with diabetes.



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- Drs. Harry Atkins and Mark Freedman have developed a stem cell therapy for certain forms of multiple sclerosis. They have treated more than two dozen patients so far, and with very promising results. Thanks to this treatment, one patient who had been confined to a wheelchair was able to fulfil her dream of dancing at her own wedding!
- Dr. Bill Stanford is using genetic reprogramming to turn normal adult skin and blood cells into powerful stem cells. His research could lead to new personalized therapies for cardiovascular disease, cancer, arthritis and many other conditions.
- Dr. Bernard Thébaud aims to use stem cells to repair the lungs of premature babies. His research could also lead to new treatments for asthma and chronic obstructive pulmonary disease.
- Dr. Lauralyn McIntyre has initiated the world's first clinical trial of a stem cell therapy for septic shock. This devastating condition occurs when an infection spreads throughout the body, killing up to 40% of those affected.
- Dr. Eve Tsai is studying stem cells in the brain and spinal cord and developing new approaches to repair and regenerate the spine after traumatic injury, stroke and cancer.
- Drs. Marjorie Brand, Barbara Vanderhyden, and Ian Lorimer are investigating how genetic mutations may cause some stem cells to become cancerous. Their research could lead to new personalized therapies for cancers that affect the blood, ovaries, brain and other parts of the body.
- Dr. Catherine Tsilfidis is investigating eye development and regeneration in hopes of developing new approaches to prevent and reverse blindness.
- Drs. Rashmi Kothary and Robin Parks are developing novel approaches to treat devastating neuromuscular diseases. Their research on strengthening muscle in spinal muscular atrophy is particularly promising.

Research changed a life

When Jennifer Molson was 21 years old, she dreamed of becoming a police officer, marrying her boyfriend and dancing at her wedding. Those dreams were shattered when she was diagnosed with multiple sclerosis. Over a period of six years she had multiple relapses. She was soon in a wheelchair, unable to work and looking for a miracle. That's when Drs. Mark Freedman and Harry Atkins from the Ottawa Hospital Research Institute told her about an experimental treatment using stem cells. Jennifer became the sixth patient in a groundbreaking clinical trial during which stem cells were extracted from her bone marrow and transplanted back into her body. Jennifer found her miracle. Today she no longer needs a wheelchair. She is off medication, works full time and leads an independent life. And, yes, she married her boyfriend and danced at her wedding.

About the Ottawa Hospital Research Institute

Our goal at the Ottawa Hospital Research Institute is to make tomorrow's health care possible today; bringing new hope to our patients, while advancing health research at a global level. The Ottawa Hospital Research Institute is the research arm of The Ottawa Hospital and an affiliated institute of the University of Ottawa, with more than 1,700 scientists, clinical investigators, trainees and staff. In 2013, The Ottawa Hospital ranked in the top five per cent of more than 4,000 academic institutions worldwide for impact of research publications, and we are currently ranked third among more than 600 Canadian hospitals for research grants from the prestigious Canadian Institutes of Health Research. With the Ottawa Hospital Research Institute's unique commitment to having PhD researchers work alongside clinicians, new discoveries are quickly brought to the patient's bedside. Whether it's new drugs, new protocols or new medical practices, patients at The Ottawa Hospital benefit from research every day.



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