LIFE SCIENCES CLUSTER

The Toronto region is home to one of the most vibrant biotechnology and life/human health sciences ecosystems in the world, where leading-edge basic and clinical trial research converge with international business expertise and advanced manufacturing capabilities. Over 50% of Canada’s life sciences companies are located in the Toronto region while 53 of the world’s top 100 life sciences multinationals and 16 of the top 25 global medical device companies operate here. The Toronto region is home to 55% of Canada’s pharmaceutical companies and 65% of its pharmaceutical jobs. Toronto’s Discovery District, a world-class downtown urban research and innovation hub, represents Canada’s largest concentration of hospitals, research institutes, business incubators and capital organizations. The Toronto Academic Health Science Network (TAHSN) comprises the University and 9 research hospitals that work collaboratively to advance high quality patient care, innovative research, and active knowledge translation to industry partners, which includes over 1,000 institutes and local companies.

HOW U of T ENHANCES THE CLUSTER

U of T researchers are global leaders in addressing some of the most important health and life sciences questions facing our society. They also lead in the development of new technologies and are dedicated to the translation of their results to companies and health care systems. For instance: the $114M federally-funded Medicine by Design project has cemented U of T’s position as one of the world’s leading centres for the design and manufacture of cells, tissues and organs that can be used to treat degenerative disease. Its commercialization partners, the Centre for Commercialization of Regenerative Medicine (CCRM) and the Centre for the Commercialization of Antibodies and Biologics (CCAB), will help Medicine by Design take regenerative medicine to the next level.

JLABS@Toronto, the first Johnson & Johnson Innovation lab to open outside the U.S., joins an extensive network of life sciences facilities that will help foster companies that are advancing pharmaceutical, medical device, consumer, and digital health products and programs. The tight integration of clinical practitioners/clinician scientists and clinical sites with U of T’s research and innovation partners makes the U of T ecosystem exceptional.

KEY EDUCATIONAL AND RESEARCH PROGRAMS

- Anatomy
- Animal Physiology
- Biochemistry, Biotechnology
- Bioinformatics & Computational Biology
- Biological Sciences
- Biomedical Toxicology
- Cell and Systems Biology
- Chemistry
- Chemical Engineering & Applied Chemistry
- Developmental Biology
- Dentistry
- Ecology & Evolutionary Biology
- Environment and Health, Biology
- Environment and Toxicology
- Environmental Chemistry
- Forestry
- Genome Biology
- Human Biology
- Immunology
- Kinesiology and Physical Education
- Medicine
- Molecular Genetics & Microbiology
- Medical Imaging
- Neuroscience
- Nursing
- Nutritional Sciences
- Occupational Therapy
- Pathobiology
- Pediatrics
- Pharmaceutical Chemistry
- Pharmacology
- Pharmacology & Biomedical Toxicology
- Physical Therapy
- Physiology
- Psychology
- Rehabilitation Science
- Speech-Language Pathology

KEY FACILITIES & INITIATIVES

- BioZone
- Donnelly Centre for Cellular and Biomolecular
- Institute of Biomaterials & Biomedical Engineering
- Centre for Cellular and Biomolecular Research
- Centre for Child Nutrition and Healthy Development
- Centre for Health Promotion
- Centre for Neurobiology of Stress
- Centre for Research in Women’s Health
- Centre for Study of Pain
- Banita & Best Diabetes Centre
- Centre for Collaborative Drug Research
- Fraser Mustard Inst. for Human Development
- Gage Occupational and Environmental Health Unit
- Ontario Institute for Cancer Research
- Ontario Tobacco Research Unit
- Heart & Stroke/Richard Lewar Centre of Excellence in Cardiovascular Research
- McAulthigh Centre
- Tanz Centre Research in Neurodegenerative Diseases
- Ted Rogers Centre for Heart Research
Deep Genomics
Founded by U of T Professor Brendan Frey and his students Babak Alipanahi and Andrew Delong, Deep Genomics combines artificial intelligence and genomic medicine in the first-ever deep learning application for determining the specificities of DNA- and RNA-binding proteins. Deep Genomic’s technology is able to handle millions of sequences per experiment to create a “mutation map” that reveals how genetic variations cause disease such as cancer and illnesses linked to aging. Genomics medicine holds the promise to significantly reduce health-care costs and improve the lives of millions.

Xagenic
Founded by U of T Professor Shana Kelley, Xagenic has developed a revolutionary diagnostic platform that will drive molecular testing out of the high complexity lab, providing results in as little as 20 minutes. The cost of the Xagenic platform is more than an order of magnitude lower than that of any other molecular diagnostic technologies, which will finally make molecular testing approachable for physician offices and clinics.

KSP2
U of T alumnus Kyle Battison founded KSP2 to provide a novel solution to complications due to inflammation that often plague medical implants. These implants, such as screws and plates for broken bones, metal hips and dental prostheses, often fail because a patient's immune system attacks these foreign objects. Inflammation can sometimes be controlled by drugs, but not always. KSP2’s technology can render the device itself non-inflammatory through a special polymer coating that interacts with white blood cells to calm inflammation. KSP2’s first product may be market-ready within the next five years—to be followed by a host of other health-related applications.

ExCellThera
Co-founded by U of T Professor Peter Zandstra, ExCellThera is a clinical stage biotechnology company that is focused on developing robust and cost-effective ways of growing blood stem cells for therapeutic use. It has developed a unique way of producing high-quality blood stem cells in large quantities. ExCellThera’s technology will also improve the outcome of stem cell transplants in patients by allowing for better-matched donors.