# Concordia University's

# CRC and CFI Strategic Research Plan: 2013-2018

# Summary


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http://www.concordia.ca/research/

## *Objectives*

The *2013-18 Strategic Research Plan* is a blueprint for the future growth and intensification of research activity at Concordia. It guides strategic level resource allocation and institutional decision-making with regard to Canada Research Chair nominations, CFI investments and other major funding and recruitment initiatives. During the life of the *Plan*, Concordia will leverage its unique role in the social, cultural and economic fabrics of Montréal, Québec and Canada to enhance our strategic leadership in key areas of research and research-creation. The university will capitalize on emerging partnerships and seize novel opportunities to extend the impact of work that further enhances our reputation as one of Canada's most innovative and creative universities.

## *Major Research Strengths*

With established and emerging strengths in both fundamental and applied research, Concordia researchers are generating foundational knowledge, nurturing discoveries, fostering innovation and making evidence-based contributions that respond to the needs of society, including the growing imperatives of adaptability and sustainability as experienced by people, communities, markets, industries, institutions and countries around the world. Our research and research-creation activity spans a wide range of disciplines and fields, utilizing an impressive diversity of methodological approaches. Concordia's 2 major research clusters comprise 6 unifying research themes and 17 unique domains of excellence for which we are widely recognized. We will continue to prioritize these areas in further developing our research and research-creation capacity.

| THE PERSON AND SOCIETY | TECHNOLOGY, INDUSTRY AND THE ENVIRONMENT |
|---|---|
| **Development and Well-being of the Person across the Lifespan**<br>» Learning, development and cognitive science<br>» Public and population health<br>» Fundamental science in health research | **Enabling Technologies and their Basic Foundations**<br>» Fundamental science<br>» Information technologies and computation<br>» Telecommunications |
| **Culture, History and Identity**<br>» Creative expression and production<br>» Media, communications , gender and sexuality<br>» People, places and heritage | **Advanced Materials and Technology**<br>» Composites, aerospace, transportation and manufacturing<br>» Nano/Microtechnology |
| **Human Systems and Organization**<br>» Corporate enterprise and entrepreneurship<br>» Social organization and resource planning<br>» Social and economic systems | **Energy, Environment and Biotechnologies**<br>» Environmental science and engineering<br>» Energy and sustainable technologies<br>» Omics and related biotechnologies |

The **PERSON AND SOCIETY** cluster encompasses leading research expertise on the lives and well-being of people as individuals and members of society; and, as the inheritors and creators of cultures, identities and systems of social and economic organization and interaction. The three themes in this cluster are marked by their groundbreaking use of digital technology and cross-disciplinary approaches to the many social, cultural, health, and economic challenges and

opportunities of contemporary life. The researchers in this cluster hail largely from, fine arts, humanities, business, social and life sciences.

## Development and Well-Being of the Person across the Lifespan

Human well-being and quality of life is predicated upon a balance of such factors as health, the ability to learn and the ability to function in society. Concordia is well-recognized as a research leader in fields such as behavioural neurobiology and appetitive motivation, child and learning studies, communications, community development, creative writing, cognitive science, ethnography, curating, mass atrocity and human rights, and oral and public history. Concordia researchers are also making influential contributions to fundamental sciences underlying today's health issues, and to increasing our understanding of the social contexts of health and related public policy issues.

- *Learning, development and cognitive science*
- *Public and population health*
- *Fundamental science in health research*

## Culture, History and Identity

Understanding human diversity and identity, and the many expressions thereof, are critical in a multicultural, rapidly changing and increasingly virtual world. The impact of cross-border or inter-regional population mobility has immense repercussions on social and political structures, and for the development of services and policies. New information and communication technologies in particular are profoundly transforming our lives, continuously reshaping how we interact and express ourselves, as well as how we represent, understand and negotiate contemporary life. Concordia is a leader in transdisciplinary research and research-creation that explores modes of expression, cultural production, context and analysis, and is highly recognized for the impact of its work in gender and sexuality studies. The scope of our research in these areas is equally marked by a commitment to community engagement and partnership activities that foster the co-construction of knowledge, both at Concordia and beyond our doorstep.

- *Creative expression and production*
- *Media, communications, gender and sexuality*
- *People, places and heritage*

## Human Systems and Organization

Many of our perceptions, institutions, cultural and philosophical traditions are shaped by large-scale interactions, forces, beliefs and systems that cross political, cultural and geographic boundaries. Our day-to-day lives are highly influenced by where we live, the languages we hear and speak, the economic conditions under which we live, the cultural influences we are exposed to and the work we do. Deepening our understanding of globalization and diversity is key to shaping a balanced approach to the complex and challenging issues facing humankind in the 21st century. In addition to social and geographically determined influences, national and transnational business and economic forces, and systems of governance affect our well-being and prosperity across many domains of our lives.

- *Corporate enterprise and entrepreneurship*
- *Social organization and resource planning*
- *Social and economic systems*

Sustainability is a major focus of the **TECHNOLOGY, INDUSTRY AND THE ENVIRONMENT** cluster where researchers are examining some of the most pressing environmental concerns of our time, including the impact of human activity, geopolitical trends, environmental risk factors and resource scarcity. In response, Concordia researchers, working together and in partnership with industry and government, are seeking new society-wide ways of decreasing our environmental footprint and re-conceiving and re-designing the energy systems we use, the items we manufacture and the buildings we live in. Most of the researchers in this cluster are from disciplines within engineering and the sciences.

## Enabling Technologies and their Basic Foundations

Many of the most transformative incremental and breakthrough advances shaping society today are dependent on research and development done in the area of enabling technologies and their foundational precursors. In the basic sciences, we have significant strengths within areas of: cell and molecular biology and biophysics; neurosciences; the interface between chemistry and biology; theoretical and computational approaches; pure and applied mathematics; and community and behavioural ecologies. Concordia also excels in information and communication technologies including wireless communications and networks, information technology (IT) security, and computational interactive media. Developments in many of these areas will be key in supporting technology-based approaches to building sustainable systems.

- *Fundamental science*
- *Information technologies and computation*
- *Telecommunications*

## Advanced Materials and Technology

Concordia houses world-class research programs in the areas of advanced materials, nanotechnology, system design, manufacturing and transportation. Extensive, industry partner-driven, research is conducted in the areas of materials and composites, polymers, coatings, micro-electro-mechanical systems (MEMS), thermo-fluid and computational fluid dynamics (CFD) and laser metrics – particularly as they apply to such manufacturing and transportation industries as aerospace and vehicle engineering. New inter-sectoral applications are now emerging to include pharmaceuticals, medical devices and environmental technologies.

- *Composites, aerospace, transportation and manufacturing*
- *Nano/Microtechnology*

## Energy, Environment and Biotechnologies

The global imperative to meet the challenges of environmental destabilization begins with a recognition that human well-being depends on maintaining environmental quality and adopting sustainable systems. Concordia's strengths in this area have been developed in multiple research

areas related to environmental science and engineering, energy and natural resources. This includes scientific assessments of human impact on the environment, implications for policies and actions regarding resource efficiency and sustainable consumption and production, as well as understanding how to adapt to climate change. On the applied side, Concordia researchers are focusing on: the development of alternative, renewable and sustainable sources of energy; energy-efficient building and construction technology; and bio-product development and other applications of "omics" based biotechnologies.

- *Environmental science and engineering*
- *Energy and sustainable technologies*
- *Omics and related biotechnologies*

## *Goals and Directions*

Our *2013-18 Strategic Research Plan* will deepen our existing major strengths and capitalize on unique opportunities to extend our research to achieve greater levels of productivity, impact and international recognition in the rapidly changing landscape of knowledge innovation and creativity. For example, we will work to increase productive linkages between researchers and units working in areas of alternative energy and sustainability, and in fields emerging from these areas. Likewise, we will promote greater cross-fertilization of research in nanoscience and advanced materials research, as well as information and related technologies. The university will continue to further its cross-disciplinary leadership in experimental media and digital humanities by evolving new zones of interaction that transcend traditional arts and design disciplines to include cutting-edge research and innovation in science, engineering, technology and business. New priorities for Concordia will include the development of research on preventive and individualized health that will establish our PERFORM Centre as one of Québec and Canada's leading platforms. We are the university in Québec best positioned to play a prominent role in the field of First Peoples research particularly in the areas of aboriginal youth and the impact of development on northern communities.

At Concordia, we measure our success by how good we are at: 1) Fostering innovation; 2) Attracting talented people; 3) Creating and optimizing state-of-the-art spaces for research and research-creation; 4) Preparing the next generation of talent; and 5) Connecting our research and research-creation activities and outcomes with the wider world.

**Fostering innovation**

- hire strategically to build capacity and leadership in areas of research strength
- encourage meaningful cross-disciplinary connections
- maintain, sustain, reinvent and design leading edge infrastructure
- nurture emerging and novel research programs
- capitalize on transformative opportunities and promote intra/inter-institutional linkages
- expand inter-sectoral partnerships with governments, industry, communities and NGOs
- celebrate excellence

**Attracting talented people**

- maintain internal best practices to allocate new CRCs and prioritize CFI projects,
- target CRCs to new faculty from elsewhere in Canada or internationally
- mentor and assist the development of early career researchers, including Tier 2 CRCs
- provide direct support and release time for CRC and other high performing researchers
- target recruitment around individuals who have clear potential to build or expand research groups and intensify training
- recruit no fewer than 5 Tier 1 and 10 Tier 2 CRCs in SSHRC and NSERC fields
- increase CRC allotment of CIHR chairs
- continue to actively recruit female candidates and members of designated groups building on success of *2008-12* when 5 of 12 new Concordia CRCs were women

**Creating state-of-the-art spaces for research and research-creation**

- manage major CFI competitions at the university level but seek input from all researchers
- employ strategic internal approach to CFI competitions
- maximize use of platforms, facilities and equipment by researchers and HQP
- target CFI envelope to projects that complement and augment existing physical resources
- prioritize creative design of research spaces to optimize collaboration and innovation

**Preparing the next generation of talent**

- prioritize new graduate program development in emerging areas of research
- increase graduate training opportunities internally
- facilitate graduate mobility within Canada and abroad
- expand Concordia's highly regarded *GradProSkills* training program
- capitalize on internship programs and innovative training opportunities
- increase number of postdoctoral fellows population in an expanded range of fields
- support and provide visibility for undergraduate research initiatives

**Connecting our research and research-creation with the wider world**

- encourage diverse range of campus-community collaborations (community economic development, public policy, social innovation)
- expand forward-thinking intellectual property and commercialization policies that drive creative and innovative uses of researchers' discoveries, inventions and findings
- facilitate inter-sectoral connections with industry and government partners
- enable international research collaborations and mobility opportunities
- maintain institutional commitment to open access (e.g., institutional repository, *Spectrum*)
- innovate in research communication (e.g., research@concordia)

## *Planning and Approval Process*

The *CRC and CFI Strategic Research Plan* was developed through an iterative and collaborative planning process under the leadership of the Vice-President, Research and Graduate Studies in consultation with all Faculties and Concordia's Senate Research Committee and Faculty Councils. The *Plan* was then approved by Senate and endorsed by the President.