

**Concordia University's
CRC and CFI Strategic Research Plan:
2018 - 2023**

**Office of the Vice-President,
Research and Graduate Studies**

Senate approved - December 14, 2018

Strategic Research Plan 2018-2023

Objectives

The 2018- 23 *Strategic Research Plan* is a guide for the intensification and growth of research activity at Concordia over the next five years. It informs strategic level resource allocation and other institutional decision-making with regard to high-profile initiatives: *Canada Research Chair* (CRC) nominations, *Canada Foundation for Innovation* (CFI)-funded projects, and other major institutional research grants and commitments. It also describes a framework of renewed commitments to support and enhance existing and emerging clusters of research and research-creation activities across the university, while applying and encouraging principles of equity, diversity and inclusiveness. Concordia will continue to leverage its position in the social, cultural and economic fabrics of Montréal, Québec and Canada in order to take advantage of new opportunities for broadened partnerships, collaborations, and knowledge mobilization-impact, in ways that matter.

Strategic Research Plan 2013-2018 Impact Summary

Key highlights include:

- Appointment of 16 CRCs and reappointments of 8 CRCs and 4 IRCs, as well as a new NSERC/Hydro-Québec Thales Senior Industrial Research Chair in Smart Grid Security
- Concordia's first equity, diversity and inclusion (EDI) action plan, mandated by the CRC secretariat but designed to be a model for action and discussion about EDI issues across all sectors at Concordia
- Through CFI funding, growth of existing and emerging research capacity including: Canada's first biofoundry for genome engineering; a Concordia node of a Quebec-wide microscopy network; a feminist media studio; a test facility for net-zero energy buildings of the future; a sleep research laboratory; a surface engineering laboratory; and equipment to uncover and harness quantum processes in engineered nanostructures
- Concordia's first indigenous CRC, appointment of two indigenous CURCs and the establishment of an Indigenous Futures cluster at MILIEUX
- Establishment of the NSERC Chair in Aerospace Design Engineering (NCADE), Concordia's first NSERC Chair in Design Engineering award
- Concordia's first successful application for a Canada Excellence Research Chair (CERC), in smart, sustainable and resilient cities and communities
- Sustained growth in research revenues during this period
- Continued leadership of the Hexagram and CSLP FRQ-SC Regroupements Stratégiques
- Leadership of numerous SSHRC Partnership Grants in diverse research areas: aging, communication and technologies; Indigenous Futures; Inuit futures in arts leadership; the SpokenWeb (networked archive of literary recordings); and educational technology to develop essential educational competencies in sub-Saharan Africa
- Concordia leadership of a new NSERC Strategic Network, Green-SEAM, in surface engineering for various advanced manufacturing applications in aerospace, automotive, mining, oil and gas, and renewable energy industries
- Successful application for funding of a new research building on the Loyola campus for the applied science hub, scheduled for completion in 2019

- Senate recognition for new university research units and infrastructure platforms building on emerging strengths in synthetic biology, microscopy and cellular imaging, sensory studies, Canadian art, aging, and clinical research in health
- Creation and growth of umbrella platforms to consolidate and grow research strengths in key areas: MILIEUX for arts, culture and technology; expansion of CIADI to coordinate and expand research in aerospace; expansion of membership in PERFORM, a preventive health research platform
- Launch of a new Department of Chemical and Materials Engineering and associated academic programs and research activities
- A highly successful Public Scholars program, which showcases the value our PhD students bring to our city and our world
- Creation of the Horizon Postdoctoral program to attract 24 to 30 world-class Postdoctoral Fellows each year

Directions and Guiding Principles

In 2016, Concordia embraced 9 *Strategic Directions* that were identified to help define, support and enhance our position as a next-generation university. Prominent amongst these is the aspiration to “Double our Research”, which has been interpreted in the broadest possible sense of becoming a more research-intensive university with: increased research funding; higher-impact outputs; more competitive and intensive research training opportunities; stronger knowledge mobilization efforts; and a willingness and ability to lead and to work across boundaries to address some of society’s greatest challenges. These goals are supported within the elements of the vision articulated in the university’s *Strategic Directions* framework, including “Mix it Up”, “Experiment Boldly”, “Get Your Hands Dirty” and “Embrace the City, Embrace the World”. The 2018-23 *Strategic Research Plan* charts a course to achieving this objective through deepening our existing major research strengths, developing emerging ones and capitalizing on new opportunities.

The following six broad principles will continue to guide the support and development of Concordia’s research and help to define our success: build on research and research-creation strengths; expand in new directions; attract and retain talent; create, update and support state-of-the-art spaces for research and research-creation; prepare the next generation of talent; and connect our research and research-creation activities and outcomes with the wider world. An overarching goal will be to incorporate best practices within each to address equity, diversity and inclusion. Specific ways in which this will be achieved include:

Build on research and research-creation strengths

- hire strategically to build capacity and leadership in areas of research strength and to develop emerging areas
- provide support for Concordia researchers to lead major inter-institutional initiatives
- identify and foster opportunities to expand areas of research strength, vertically and horizontally
- recognize and reward excellence in the research endeavour

Expand in new directions

- encourage meaningful cross-disciplinary connections, both internally and externally
- nurture emerging and novel research programs

- capitalize on transformative opportunities
- expand inter-sectoral partnerships with governments, industry, communities and NGOs

Attract and retain talent

- apply and continuously improve internal best practices to allocate new CRCs, CURCs IRCs and CFI project priorities
- strive to achieve the goals of Concordia's EDI plan for CRCs and to extend them to other aspects of the research enterprise
- collaborate with the Indigenous Directions Leadership group in not only attracting and retaining Indigenous faculty but also to incorporate our commitment to understanding and responding to the Truth and Reconciliation's (TRC) principles within the research ecosystem
- provide direct support and release time for research chairs and other high-performing researchers
- ensure availability of resources for the attraction and development of early career researchers
- throughout the university, work continually to provide the most effective and efficient support for researchers and administration of research

Create, update and support state-of-the-art spaces for research and research-creation

- target CFI envelope to projects that complement and augment existing physical resources both at Concordia and elsewhere in the area, in ways that are accessible to our research community
- maximize use of platforms, facilities and equipment by researchers, collaborators and HQP
- target operation cost support and equipment upgrade funding envelopes in optimal ways to encourage collaborative research infrastructures
- prioritize creative design of research and research-creation spaces to facilitate and optimize collaboration and innovation
- encourage and support more extensive participation in inter-institutional networks
- improve institutional support for research computing

Preparing the next generation of talent

- prioritize new graduate program development in growing and emerging areas of research, including high risk, future-oriented areas that cross disciplinary boundaries
- support new and enhanced graduate student training opportunities (e.g. summer graduate schools, multidisciplinary programs, experiential and work-related learning, GradProSkills workshops)
- provide students access to entrepreneurial activities to acquire the skills for moving ideas to market, including scientific and social innovation
- facilitate graduate student mobility within Canada and abroad
- attract increased numbers of postdoctoral fellows 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 (e.g. community economic development, public policy, social innovation)

- expand forward-thinking intellectual property, technology transfer and commercialization policies and support mechanisms that drive creative and innovative uses of research discoveries, inventions and findings to benefit society
- enable international research collaborations and mobility opportunities
- maintain institutional commitment to open access (e.g., institutional repository, *Spectrum*)
- innovate in how we showcase and communicate our research and research-creation activities

Progress in meeting these objectives will be reported annually by the Office of the Vice-President, Research and Graduate Studies to the Senate Research Committee, from which it will also solicit input and guidance.

Major Research Strengths

Concordia University research is constantly evolving in response to the drive to advance knowledge, to serve the needs of society and to engage and guide the next generation of researchers. It spans a series of continuums from the most fundamental kinds of studies to the most applied, from the efforts of individuals to the synergies of networks, from the local to the international and from the fine arts and humanities to business to engineering and the sciences. More and more it is driven by the efforts of individuals across and between disciplines, working on joint research projects, pooling intellectual, financial and infrastructure resources together, collaborating at interdisciplinary research centres, and in conjunction with partners in academia, the community, government, NGOs and the private sector.

Within the Concordia research ecosystem, six unifying research themes may be discerned, for which we are widely recognized and where we have concentrated investments such as Canada Research Chair allocations, CFI infrastructure projects, Concordia University Research Chairs, Special Professorships, and University research units and infrastructure platforms. These areas were in large part originally identified in the previous Strategic Research Plan, and were used successfully to build research capacity at Concordia over the past five years. However it is increasingly evident that Concordia's research crosses over and between these identified strengths. Although we will continue to prioritize and build excellence within these areas and ancillary disciplines, fostering the cross-fertilizations between them will be key in further developing our research and research-creation strengths over the next five years. We believe also that a transdisciplinary approach within each of these themes with researchers from different fields will warrant a greater impact.

1. Health, Development and Well-being of the Person across the Lifespan and in Society

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 aging, behavioural neurobiology and appetitive motivation, child and learning studies, cognitive science, community development, creative arts therapies, educational technologies, psychosocial determinants of physical and mental health and sensory studies. Concordia researchers make influential contributions to addressing today's health and well-being issues via both fundamental and applied approaches, and by increasing our understanding of the social contexts of health and related public policy issues.

2. Arts, Culture, History and Identity

Understanding human diversity and identity, together with their many expressions, are critical in a multicultural and rapidly-changing world. New information and communication technologies in particular are profoundly transforming our lives, continuously reshaping how we interact, intervene, and express ourselves, as well as how we represent, understand and negotiate contemporary life. Concordia is in the forefront of research and research-creation that explores cinema and digital media, creative writing, contemporary art practices, curatorial research and practice, cultural history, cultural and identity issues in business and marketing, ethnographic practices, games and gaming, gender and sexuality, human rights, Indigenous ways of knowing and sharing, media studies (including production, history and criticism), new technologies in the arts and humanities, oral and public history, and the performing and visual arts.

3. People, Organizations and Society

Interactions between people, be it as individuals, communities or organizational groupings, shape our present-day systems and structures. Society as a whole is highly influenced by these interactions as well as by economic conditions and cultural factors that must constantly adapt and respond to create pathways for meaningful interactions and inquiries. In addition to social, cultural and geographically-determined influences, national and transnational business and economic forces affect our well-being and prosperity. Our own cultural heritage, together with the impacts of human mobility and immigration, underlie social and political structures, and the development of the relevant services and policies. Deepening our understanding of the dynamics of choice, consumerism, entrepreneurship, governance, leadership styles, organizational behavior and identity in an ever-changing societal landscape are keys to shaping a balanced approach to complex and challenging issues facing humankind in the 21st century.

4. Enabling and Disruptive Technologies and their Foundations

Many of the most transformative advances shaping society today are dependent on research and development done in the area of enabling technologies and their foundational precursors. Our expertise in artificial intelligence, cyberphysical systems, cybersecurity, data analytics, design, internet of things, information and communications technology (ICT - including telecommunications, electromagnetics and antennas, hardware design and verification; signal processing, and control systems), microsystems, micro- and nano-electronics, power systems, robotics, sensors, software engineering and supply chain is in demand for many types of applications. Within the life sciences sphere, research strengths include bioimaging, informatics, omics technologies, and synthetic biology and their applications. The disruptive nature of many of these technologies feeds critique and research into their impacts on society and the economy by social science, humanities, business and fine arts researchers. In the basic sciences, we have significant strengths within the areas of: cell and molecular biology, neurosciences, the interface between chemistry and biology, theoretical and computational approaches, and pure and applied mathematics.

5. Advanced Materials and their Applications

Materials and the ways in which they are made, used and assembled form the basis for this area of research strength. Concordia houses world-class research in the areas of advanced manufacturing, mechatronics, nanotechnologies, new materials, system design, and robotics. Well-developed programs include composites, nanomaterials, polymers, surface engineering, and smart textiles and clothing. Specific applications of this research at Concordia, much of

which is interdisciplinary and intersectoral, include: aerospace design and manufacturing; aerospace technology, including control systems, autonomy, UAVs, and avionics; and biomedical applications such as biosignal processing, biocompatible materials, robotics and biomechanics, and health care technology development.

6. Natural Systems and Sustainability

The global imperative to meet the challenges of environmental destabilization begins with recognition of the importance of maintaining the quality of our natural systems and adopting sustainable human systems and technology to minimize environmental impacts. Concordia's strengths in this area have been developed in multiple inter-disciplinary research areas related to biodiversity, climate change, ecology, energy and natural resources. Our researchers are focusing on: the development of alternative, renewable and sustainable sources of energy; corporate social responsibility and sustainability; design and support of energy efficient and resilient buildings, communities and transportation; green products; sustainable civil infrastructure; transportation infrastructures and logistics; and water resource management. Science and engineering approaches are complemented by 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 respond to climate change from a variety of sustainable technologies, organizational systems, built environment alternatives, and resource management systems.

Building and expanding research strengths: We seek to grow in all of our major research areas, encouraging departments, units and Faculties from across the university to contribute organically from within their own specialties, but also inspiring them to work together between themselves and with partners to investigate these areas from broad and diverse perspectives. For example, as part of the *Strategic Directions* exercise, we have committed to develop two new umbrella platforms to support and grow research in health, and in smart, sustainable and resilient communities and cities, areas where we have considerable strengths amongst individual researchers and research units across the university. The smart, sustainable and resilient communities and cities initiative will be enhanced considerably by the activities of Concordia's first Canada Excellence Research Chair, expected to join in 2019. Also in 2019, the Applied Science Hub, which houses researchers from the new department of Chemical and Materials Engineering and expanded facilities for applied nanoscience research and biotechnologies, together with Concordia's start-up incubator, D3 and its Galilei Ventures, will provide new opportunities to transfer research from the bench to the real world. We will also continue to develop existing platforms: the MILIEUX Institute, which brings together researchers working at the intersection of design, art, culture and technology; CIADI, the Concordia Institute for Aerospace Design and Innovation, to coordinate and grow Concordia's aerospace education and research activities; and PERFORM, a platform dedicated to preventive health research.

Concordia has, with the formation of the Indigenous Directions Leadership group, acted on its commitment to find ways to improve its responsiveness to the Truth and Reconciliation's (TRC) Principles for Reconciliation and Calls to Action. Already a leader in Quebec and Canada, we will work together to prioritize and support building on our unique research and research-creation strengths in Indigenous issues, including youth and child welfare, impacts of new media and technologies, cultural identities, indigenous futures, co-construction of knowledge, art, and environmental and resource protection.

Canada Research Chair (CRC) Allocations

Equity, Diversity and Inclusion: Concordia University recognizes the essential role of diversity in fostering excellence by improving learning, advancing research, inspiring creativity, driving productivity and enhancing the experience and morale of the entire institution. Our [Equity, Diversity and Inclusion \(EDI\) Action Plan for the Canada Research Chairs \(CRC\) Program](#) specifically details how the university will address gaps in meeting and exceeding the targets for the four designated groups. The plan includes a number of key actions, at all stages from allocation to recruitment to hire to evaluation to renewal, to insure the success of the *Plan* in meeting and exceeding targets for the 4 designated groups. The current equity targets and gaps may be found at:

<https://www.concordia.ca/content/dam/research/docs/CRC/CRC%20Targets%20and%20Gaps%20at%20Concordia%20-%202017-12-15.pdf>

Adherence to the plan will be monitored closely at all stages by the Office of the Vice President, Research and Graduate Studies, in close collaboration with the Office of the Provost.

Filling CRC allocations 2018-2023: A current list of CRC allocations, including vacant positions, may be found at

<https://www.concordia.ca/content/dam/research/docs/CRC/Concordia%20CRC%20Utilization%20Table%20-%202017-12-15.pdf>

New CRCs will be filled using the process outlined below, while also respecting the EDI Action Plan.

Process, Retention and Recruitment: Concordia University has robust policies and practices in place to encourage recruitment and retention of the world-class talent required to fill CRC positions. The Senate-approved [Policy on Research Chairs \(VPRGS-7\)](#) stipulates that allotted CRCs be used to recruit new researchers from outside the university, and that a significant portion of CRC funds be invested in the Chairholder's research program. The opportunity to submit an application for a CRC is determined by a university-wide call for Letters of Intent (LOIs) where the strategic impact of allocating a Canada Research Chair in a given research area must be demonstrated, including the fit with the *Strategic Research Plan* and following the recommendations of the *EDI Action Plan for CRCs*. LOIs are prioritized by Faculty Research Committees and then submitted to the University Research Committee, which will take into consideration FRC rankings and justifications to select the strategic areas for allocation of CRCs.

The search process is initiated with the home department(s) of the selected candidates, as per the Concordia University Faculty Association (CUFA) collective agreement. In general, searches are unrestricted with regards to awardees from inside Canada vs outside.

While CRC awards are restricted to applicants recruited from outside the university, five-year *Concordia University Research Chairs (CURCs)* are reserved for faculty members already at Concordia. They are awarded following a process very similar to that described for CRCs, and yearly competitions help to ensure that the CURC program remains vigorous and accessible as a retention tool.

Canadian Foundation for Innovation (CFI) Allocations

All CFI applications must be justified in light of the *Strategic Research Plan*. Concordia holds open, university-wide calls for the CFI IF program, and strongly encourages both intra- and inter-institutional collaborations. The CFI-JELF program is managed centrally and used in the first instance to fulfill our commitment that each candidate for a new CRC nomination have an amount available to request infrastructure that will support the CRC research program (*Research Chair Policy VPRGS-7*). The second priority is support of other externally-funded institutional research chairs and major projects, and if any additional funds are available they are allotted strategically to help support the research programs of recent faculty hires.

Internal Support for Research Development and Mobilization

Concordia's internal funding programs include seed funding (team and individual), university research units, facilities support, research events, CURC, and other Chairs and Professorships. These programs help to position Concordia to support and leverage external funding opportunities and investments. The Office of the Vice-President, Research and Graduate Studies provides, in concert with the Faculties, institutional funding for major initiatives such as CFI; SSHRC Partnership and Partnership Development; NSERC CREATE; NSERC Strategic Networks; and FRQ Regroupements Stratégiques.

Allocations per major research theme

The following table indicates the distribution of major resources amongst the six research themes at the end of 2018.

Research Theme	Canada Research Chairs	Concordia Univ Research Chairs	University Research Units	Other Research Chairs
Advanced Materials and Tech	3	6	2	3
Culture Arts History Identity	6	14	6	4
Development and Well-Being	6	11	5	3
Enabling Technologies	7	14	6	2
Natural Systems, Sustainable Technologies and Sustainable Communities	3	11	2	2
People Organizations and Society	1	10	0	12
TOTAL	26	66	21	26

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 researchers, all Faculty Councils, and Concordia's Senate Research Committee. The *Plan* was then approved by Senate and endorsed by the President.