



**CONCORDIA UNIVERSITY'S
CRC and CFI STRATEGIC RESEARCH PLAN
2023-2028**

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CONCORDIA

STRATEGIC RESEARCH PLAN 2023-2028

Concordia University is reimagining the future of higher education. Our innovative approach to cross-functional research, research collaboration and experiential learning has cemented our place among the [top-ranked universities in North America under 50](#). Located in vibrant Montréal, on the traditional lands of the Kanien'kehá:ka, Concordia University practices social responsibility to create a more equitable and sustainable world through its research and training of the next generation of researchers and innovators.

Concordia University's *Strategic Research Plan 2023-2028* (the Plan) is a framework for the focused growth of research activity over the next five years. It outlines a series of principles and commitments to support and enhance existing and emerging clusters of research and research-creation activities across the university. Research at Concordia happens in a wide variety of fields and the university will continue to foster a vibrant and supportive research environment that values the diverse nature of research carried out by Concordia researchers. In this Plan, we have opted to focus on major existing and emerging research *themes* where research expertise, research units, and facilities are currently concentrated. These themes enhance the strategic vision and capacity of the university to leverage its strengths and its position in the socio-environmental, cultural, and economic fabrics of Montréal, Québec and Canada, to address pressing local, national, and global challenges through research, collaborations/partnerships with diverse stakeholders, innovation, and knowledge mobilization activities. The clusters of strength identified in this Plan have emerged from the research underway across all disciplines, research units, and Faculties and Schools: the Faculty of Arts and Science, the Faculty of Fine Arts, the Gina Cody School of Engineering and Computer Science, the John Molson School of Business, and the School of Health. The Plan will also inform strategic level resource allocation for high-profile initiatives such as Canada Research Chair (CRC) nominations, Canada Foundation for Innovation (CFI)-funded projects, and other major institutional research grants and commitments.

STRATEGIC OBJECTIVES

The Plan identifies four strategic objectives, each contributing to increase Concordia's research excellence in a wide array of fields, including – but not limited to – the areas of research identified as strengths in this plan. These objectives are overarching and inform all four strategic research themes that follow. They are informed by our vision for, and commitment to, a diverse and inclusive environment where researchers and students dare to push the frontiers of knowledge, pursue different ways of knowing and learning, embark on high-risk, high-reward research endeavours and embrace a collaborative spirit that brings together key actors and mobilizes knowledge in innovative ways to tackle grand challenges and strengthen Canada's position in the world. These objectives will guide Concordia's actions and performance measures in research and innovation over the next five years. The university's success in fulfilling these commitments depends greatly on the supportive partnerships within our research and innovation ecosystem: all relevant units across the university, as well as our numerous governmental, industrial, and not-for-profit partners, communities, organizations, and institutions.

Objective 1: Achieve smart, sustainable, and resilient growth and global leadership in research and innovation

- Accelerate global leadership in research and innovation, and research-creation, by ensuring that our funded research and research-creation programs, the number and quality of our research partnerships, our record in training the next generation of researchers and innovators in research and research-creation, our innovativeness and creativity in research, and our entrepreneurship, are up to the highest global standards, and that institutional supports are actively and creatively mobilized.

- Foster and encourage academic curiosity and fundamental and applied research.
- Support bold, high-risk, high-reward initiatives.
- Establish and support research institutes and units as critical tools for the advancement of research and interdisciplinarity.
- Invest smartly and sustainably in research infrastructure (space, facilities, staff) and support institutionally prioritized initiatives to secure additional infrastructure funding that make cutting-edge research possible.
- Provide opportunities for students at all levels to engage in fundamental and applied research and innovation activities.
- Recognize the centrality of students to the university's research and innovation mission and encourage research-informed and research-centered pedagogy that will enhance our position as a preferred destination for future students, researchers, and innovators from across Canada and around the world.
- Develop and enhance experiential learning opportunities (internship opportunities, community-engaged learning) that give students hands-on experience in the real world.

Objective 2: Support research innovation that helps tackle local, national, and global challenges

- Enhance and develop areas of research strength that address emerging national and global needs.
- Recognize and support research initiatives that result in tangible benefits for individuals, organizations, groups, and communities, and that contribute to sustainability and social justice.
- Mobilize institutional resources to establish collaborations and partnerships with world-renowned and/or impactful partners (companies, organizations, researchers) that engage in cutting-edge, innovative, and transformative research locally, nationally, and globally.

Objective 3: Embrace inclusive excellence and Indigenous knowledges

- Become a leader in developing and advancing best practices in Equity, Diversity, Inclusion and Accessibility (EDIA) to build a culture of inclusive excellence that recognizes the integral relationship between diversity and excellence in research.
- Recognize that inclusive excellence depends on a diversity of identities, in addition to a diversity of disciplines, ways of learning and knowing, and life experiences.
- Strive to promote and incorporate Indigenous Knowledges and Indigenous ways of knowing throughout the research enterprise, mindful that Indigenous ways of knowing are steeped in a deep reciprocal relationship with the land.
- Recognize the rights of Indigenous people to be leaders, equal partners and beneficiaries in culturally-appropriate research that responds directly to their interests and priorities.
- Ensure that research undertaken with Indigenous nations, communities, organizations, and/or individuals respects the importance of building reciprocal relationships grounded in meaningful consultations and principles of free, prior, and informed consent.
- Recognize and reward non-traditional research outputs including research creation, advocacy, policy, and community-based research.
- Provide students with a diverse, accessible, inclusive, and safe learning, research, and work environment.

Objective 4: Enhance impact and engagement through academic, industrial, and community networks and partnerships

- Encourage and support leadership of and participation in major inter-institutional initiatives, by further enhancing existing relationships and exploring potential avenues for new collaborations.
- Promote collaborations with other academics (within and across disciplines) and academic institutions by leveraging and pooling complementary and diverse research strengths, resources, and infrastructure both within and beyond Concordia.
- Encourage research institutes and units, to engage with the public, community organizations, and other partners, to advance collaborative and participatory research, community engagement, and knowledge mobilization, and to enhance the societal impact of research.
- Increase number and scope of local, national, and international NGO, government/public sector, and industry partnerships by intensifying business development activities and support.
- Encourage and support research collaborations and co-creation of knowledge with community groups and organizations.
- Promote knowledge mobilization activities and mobilize resources for greater community engagement and enhanced societal impact of research.
- Enhance the collaborative research funding portfolio through targeted efforts to encourage and support submissions to partnership-centric funding opportunities.
- Facilitate the procurement of funding from non-traditional sources.
- Increase support for intellectual property management, through open science and commercialization approaches.
- Promote a spirit of entrepreneurship and a start-up culture, by providing mentorship, expertise, space, networks, resources and opportunities for collaboration, to students and faculty engaged in innovation, entrepreneurial, and commercialization activities.
- Identify barriers and provide opportunities for inter-disciplinary, multi-disciplinary, and trans-disciplinary dialogue to address complex research questions.

STRATEGIC RESEARCH THEMES

Our Plan identifies four thematic areas that engage our research community and our partners. Our researchers use diverse research methods to examine questions driven by scientific curiosity, leading to both fundamental and applied discoveries, and contribute to the quest for innovative solutions to pressing challenges. These themes should be viewed as porous. They intersect and interact in many ways and on many levels: interdisciplinary and intersectoral research at Concordia happens within each of the themes and sub-themes, and across all four of them; they can also expand into new areas over time. Through emphasis on these four broad themes and several sub-themes, we will support and enhance our existing and emerging strengths in both disciplinary and interdisciplinary research, with a view to achieving further breakthroughs that will in turn translate into solutions to challenges on local, national, and global scales. The themes and sub-themes are not meant to be exhaustive of all the excellent research at the university – nor limit the emergence of new strengths – but rather aim to explore and shape a vision for how Concordia can, in the short and medium terms, pool or distribute its resources to enhance our research standing, and increase the value of our contributions. Concordia has also concentrated investments through university-recognized research units and infrastructure platforms, the large majority of which fall into one or more of the themes presented below. The university has also invested in the creation of three institutional-level research institutes, which serve as federators of units and enhance interdisciplinary collaborations.

THEME 1: RE-DEFINING/RE-IMAGINING LIFE AND SOCIETY THROUGH DIGITAL TECHNOLOGIES AND DIGITAL CREATIVITY

Concordia's researchers and trainees are working in innovative ways to better understand how the digital revolution is impacting individuals, and transforming organizations, economies, and society at large. They are also at the forefront of the innovation ecosystem and leaders in the development of emerging and enabling technologies such as artificial intelligence, machine learning, internet of things, information and communications technologies, bioimaging, and the study of how their application(s) can redefine possibilities in areas as diverse as: health care; education; urban development and climate change mitigation; sustainable design, sustainable development, and sustainable living; advanced manufacturing; media, arts, and entertainment; business, finance and entrepreneurship; and governance and public policy. Concordia researchers are building and exploring human interactions with complex technologies, and examining the human, ethical, social, economic, and other implications of how we design, plan, and deploy new technologies.

Sub-theme 1.1: Computational advances: data analytics, software engineering, artificial intelligence + applications

Concordia is at the forefront of the push to advance next-generation computing, analytical tools, models, and algorithms. Big data analytics has been transforming industry and science in various domains for the past several years, making it possible to process huge amounts of data daily, aided by the evolution of programming models, data analysis algorithms, and computing infrastructures. The benefits are immense and the possibilities endless: innovation, learning, insight, productivity growth, and major improvements in countless sectors. Concordia researchers are leaders in the computing and data science revolution, seeking to harness the full potential of big data for applications in healthcare, supply chain management, computational finance, urban planning, energy management, logistics, transport systems, and environmental monitoring. Big data comes with big concerns and Concordia researchers are concerned with the privacy, security, and ethical implications of big data.

Today, artificial intelligence is prominent and central to existing and new technologies. Concordia occupies a prominent and increasingly central place in the Québec and Canadian AI innovation ecosystem, through both its research innovation and its start-up culture. Concordia researchers are leaders in research on artificial intelligence, machine learning, deep learning, human-computer interaction, pattern recognition, virtual environments, augmented reality, bioinformatics, and the social, ethical, and political issues associated with AI. The recently launched *Applied AI Institute* fosters disciplinary and interdisciplinary collaborations tackling important problems in fields ranging from telecommunications to human-machine systems, social-cultural studies, business, and finance. We will address pressing challenges such as climate change, health and well-being, sustainable cities, food production and security, and wildlife preservation.

Sub-theme 1.2: Cybersecurity

Recent technological innovations have unlocked huge opportunities for economic and business growth and productivity. They have also given rise to new and rapidly evolving cyber risks that are raising the bar on cybersecurity. Cyberattacks have the power to cripple information systems and communication networks and disrupt our critical infrastructure. Concordia is at the vanguard of this rapidly evolving and strategic field. Our researchers are working to develop innovative processes, methodologies, techniques, and technologies to enhance the security and resiliency of our systems while protecting our privacy in the 21st century. At the same time, we provide ethical reflections on individual privacy. From cybersecurity,

privacy, digital forensics to cryptography, blockchain technologies and critical infrastructure protection, our researchers are developing innovative approaches to safeguard our digital future.

Sub-theme 1.3: Arts, identities, politics, and media through a digital lens

Digitization and our reliance on new technologies have changed cultural production, opened new horizons for artistic expression/creation, shaped identities and narratives, altered politics, transformed markets, businesses, entrepreneurship, and consumer behaviours, revolutionized media, engaged, helped or disadvantaged specific groups or communities, increased resilience to various challenges, and brought mediatic, employment, and social disruption. The advent of artificial intelligence, algorithms, and the internet have created new challenges alongside opportunities, potentially threatening democracy, political legitimacy, and human rights, giving rise to fake news and misinformation, increased hate speech and extremism via the internet and social media. Digital technologies have also raised equity and ethical issues around ownership, access, and conditions for sharing data, especially as it relates to Indigenous peoples and marginalized communities. Concordia boasts a rich community of researchers and research-creators who explore these topics through fundamental research and research-creation, including the methodologies, histories, and effects of creativity and art (including fiction, non-fiction, and journalistic productions), the ways in which creativity can be expressed both digitally and otherwise, as well as providing a critical analysis perspective on digital technologies. Our researchers take digital arts outside normal disciplinary boundaries to explore the past, investigate the present, and speculate on the future. The *Milieux Institute for Arts, Culture, and Technology* provides a forum for interdisciplinary researchers at Concordia to explore new media arts, digital culture, and information technology from multiple angles.

Sub-theme 1.4: Smart, innovative, and entrepreneurial solutions to contemporary problems

Concordia is at the forefront of research on enabling and disruptive technologies and their foundations. From artificial intelligence, cyberphysical systems, cybersecurity, data analytics, digital twins and internet of things, to information and communications technologies (ICT – including telecommunications, electromagnetics and antennas, hardware design and verification, signal processing, and control systems), micro- and nano- electronics, robotics, sensors, software engineering, and supply chains, our researchers push the frontiers of science and innovation. They engage in research and innovation out of a sense of scientific curiosity while also recognizing its transformative power. Our researchers work extensively and collaboratively with community and industry partners to develop innovative and smart solutions to problems as varied as climate change and sustainability, managing intermittent renewable resources and the built environment's energy demand, health and well-being (e.g. medical diagnostics, bioimaging, medical devices, biomedical engineering, wearables, healthy and empowered aging, lab-on-chip solutions, synthetic biology and genomics for health), food production/security, transportation and aerospace (e.g. electric vehicles, sustainable aerospace, traffic congestion, airports), critical infrastructure, telecommunications, and Industry 4.0. In addition to material innovations, Concordia researchers are studying the role of entrepreneurship, and the different manifestations of entrepreneurship and innovation around the world, as well as their potential to transform society. Enabling and disruptive technologies' transformative power on individuals, communities, and societies necessitates an examination of the various contexts and structures – regulatory, governance, or other – in which technological developments take place and how they shape everyday lives. Through research and collaboration with community, industry, and government partners, our researchers enhance digital literacy and digital citizenship by drawing attention to the negative externalities of digital innovation and recommending ways for their responsible adoption.

THEME 2: ENHANCING INCLUSION AND SOCIAL JUSTICE

Concordia's researchers explore the foundations of social and economic organization, the underpinnings of poverty, economic inequality, gender oppression, racism, ageism, migration, and other forms of discrimination based on disabilities, sexual orientation, ethnicity, or citizenship. They also explore what motivates and spurs social movements, public protest, uprisings, and political change. It is crucial to explore not only the what, but also the why and how questions of inclusion and social and economic justice. The exploration of these questions requires not only input from many academic disciplines, but also the public. The lived experiences and voices of various groups/communities/minorities are crucial to understanding the source of grievances and problems, as well as to finding solutions. Through understanding the various underpinnings of these experiences, and how new challenges affect groups within society differently, we better address grievances, enhance social and economic justice, promote inclusion, and tailor solutions in ways that are appropriate, mindful, and inclusive. Our researchers collaborate across multiple disciplines, and partner with a variety of communities, locally, nationally, and internationally, to better understand the contexts and experiences of specific communities, with a view to better understanding the particularities but also the commonalities of experiences and bringing about positive changes. Our researchers prioritize working with communities to co-create creative solutions to the socio-economic challenges stemming from historical and/or contemporary injustices.

Sub-theme 2.1: Inclusion and exclusion

Concordia is at the forefront of research into the causes and effects of social exclusion across time and space. Our researchers explore the daily expressions and practices, public policies, of inclusion and exclusion, as well as historical and contemporary forces that enable and constrain participation in social, cultural, political, and economic life. Through critical interdisciplinary perspectives and empirical investigation, our researchers aim to foreground how experiences of inclusion and exclusion are shaped by gender, race, age, class, ability, and sexual orientation. In addition to gender studies and feminist scholarship, Concordia has significant strengths in Black studies and perspectives, studies on aging and ageism, critical disability studies, the study of systemic racism, the study of sexuality, sexual orientation, and LGBTQ+ lived experiences. Our experts explore the various manifestations and consequences of vulnerability and exclusion related to health and well-being, access to services, accessibility, reproductive rights, personal safety, and educational opportunities. Our researchers also explore the 'othering' and marginalization of groups that underpins organized violence and mass atrocities.

Sub-theme 2.2: Indigenous histories, territories, languages, arts, present, and futures

Concordia reaffirms the critical role of Indigenous leadership and partnership in research, research creation, innovation, and the production of knowledge. Our researchers explore Indigenous histories, languages, and arts, in celebration of the richness of Indigenous heritage, and with a view to preserving and revitalizing Indigenous languages and cultures, and understanding and transmitting stories and histories to future generations. Working with Indigenous epistemologies, they challenge assumptions about what we think we know and how we know it, and leverage Indigenous philosophies, beliefs, traditions, knowledges, and practices to better understand and support Indigenous self-determination in the protection of lands, waters and wildlife, and practices of health, well-being and living well. Contemporary challenges facing Indigenous people are addressed, from governance and treaty rights to health disparities and gender-based violence, exposing their roots in colonialism, racism, and historical trauma. In addition, we seek to enhance partnerships with Indigenous and northern communities in the co-design of smart, resilient, net-zero solar buildings and communities, as well as to augment accessibility and connectivity, particularly for northern communities, through sustainable, smart, and resilient aerospace technologies and infrastructure. Availing of various narratives, frameworks, and technologies

(such as the *Indigenous Futures Research Centre*), Concordia scholars, through research collaborations with Indigenous partners, are exploring Indigenous futures that help articulate a continuum between Indigenous histories, present, and futures.

Sub-theme 2.3: Social justice, public protest, and change

Concordia scholars contribute ideas, research, and actions for a just society. We conduct contemporary and historical research to identify the deep causes of grievances or dissatisfaction that lead to social movements, public protest, and in extreme cases, strife — from ideas and ideologies, feelings of injustice and inequality, poverty and disease, to resource scarcity, weapons proliferation, and failures of governance. They seek to understand why/how some social movements gain traction, adopt appropriate methods, and succeed, while others fail. Forging a just, equitable, and prosperous society requires an understanding of the types of arrangements and solutions that can lead to greater diversity, inclusiveness, and social justice. Our researchers study the causes, dynamics, outcomes, and consequences of social movements, public protest, and social strife, as well as the building blocks of a just society. Through interdisciplinary collaborations and community engagement, our experts explore how technology, improved access to health and public transportation, spatial configuration/urban design, and other elements, can foster greater inclusion, diversity, equality, fairness, and justice.

Sub-theme 2.4: Cultural production and performance in the public sphere

Concordia researchers, whether conducting applied or fundamental research or research-creation, interpret, analyze, and produce culture, as well as convene publics to participate in cultural discourse. Cultural production affords insight into the values, meanings, needs, and contributions of society. Research of this kind enables better understandings of ourselves and our world, and enacts a form of dissent, resistance, and protest. While in some cases dissent, resistance, and protest are implicit in the work of cultural production and/or performance, in others, works seemingly devoid of politics acquire a subversive edge across time, context, or geographical location. Whatever their means of creative expression, producers of culture – writers, journalists, artists, performers – have an important role to play in critiquing and/or celebrating culture, pointing to forms of justice/injustice, or equity/inequity, gathering and inspiring the public and strengthening the voices of the oppressed. Our researchers and research-creators explore the role of artists, and intellectuals in making the world a better place, the role of cultural production in the public sphere in encouraging resilience, promoting radical social change, and fostering reconciliation, as well as the role of life stories and storytelling in the public sphere.

Sub-theme 2.5: Mobility and migration

Our researchers examine population movement across spaces, societal perspectives towards refugees and asylum seekers, immigration policy, integration of newcomers in host societies, and the emergence and challenges of sanctuary cities. An important research theme is the historical and contemporary study of identity and belonging of diasporas and transnational communities in Canada and across the world. As scholars based in Montréal, an international port and a city with a unique identity – francophone, anglophone, and Indigenous – Concordia researchers engage in the cultural, sociological, and scientific study of language, from the role of language in group identity and solidarity to the cognitive aspects of language learning and use. Our scholars delve into the everyday lived experiences and daily practices of displacement, through narratives and storytelling, as well as the digital tools used to document, archive, and share life stories on migration, deindustrialization, urban change, and community life.

THEME 3: UNDERSTANDING THE FOUNDATIONS OF HUMAN HEALTH AND ENHANCING HEALTHY LIVING

Concordia researchers at the intersection of a variety of disciplines collaborate and conduct fundamental and applied research in a wide array of health-related areas. These encompass the human life span, from the basis of life to living societies. This work pioneers new understandings, approaches, technologies, and devices, and engages with citizens, community groups, policy-makers, end-users, and industrial collaborators. Further, the new School of Health aims to be a global reference point for next-generation approaches to health research and training focused on enhancing the quality of human life and the innovative design of healthy communities. Research on aspects of physical and psychological health, development across the life span (including but not limited to aging), synthetic biology and applications, and biomedical engineering, can be identified as key.

Sub-theme 3.1: Physical and psychological health and well-being

Physical and psychological health and well-being require investigations at all scales, i.e., at the molecular, cellular, and system levels, as well as their interconnectivity. This knowledge enables a better understanding of disease and healthy states, drug resistance, impact of external/environmental factors on health, and guides the design, discovery, and development of treatments, preventive measures, interventions, and diagnostics to improve health. Concordia has extensive expertise in cognitive science and behavioural neuroscience. We study psychological processes and disorders, as well as neurophysiological, biological, and social factors associated with behavioural and psychological problems and their remediation. Our researchers seek to improve and sustain long-term physical and psychological health by exploring measures for disease prevention including health behaviours and lifestyle and their impact on chronic diseases and nutrition. We also seek to explore the benefits to physical and mental health and well-being of creative arts therapies such as visual arts and creative practices, drama therapy, music therapy, and play therapy. Our researchers also examine workforce/workplace health and resilience.

Sub-theme 3.2: Synthetic biology and genomics, and their applications

Concordia has extensive research capacity in areas that can have applications in biomedical science and engineering. Our researchers are actively engaged via genomic and synthetic biology approaches for targets screening and characterization; synthetic biology approaches to develop and test new products and cellular pathways; humanizing the post-translational modification systems in yeasts and fungi to facilitate the production of human-derived proteins; mining fungal/bacteria genomes for the development of novel antibiotics and probiotics; and design of biosensors. This research has important applications in drug discovery and therapeutics, for a broad range of health needs from cancer drug development and delivery to antibiotics and antibiotic resistance. Concordia has emerging strengths in bioprocessing; our researchers use natural and genetically-modified living cells or organisms (e.g. bacteria, fungi, plants) and parts thereof (e.g., enzymes, DNA) to obtain products or services; they can also design, build, and test real or virtual tools, machines (e.g., reactors, software) and procedures used in the development, fabrication, and manufacturing of such products and services.

Sub-theme 3.3: Empowered Aging

Canada is experiencing the opportunities and the challenges of a major aging revolution. Concordia is extremely well-situated to respond to this and boasts a critical mass of experts conducting research on aspects of aging across all four Faculties/Schools. Our *engAGE Centre for Research on Aging* gathers experts who conduct research on the social, political, health-related, and technological dimensions of aging. For our researchers, empowered aging addresses aging as a lifelong process that encompasses the

social, physical, mental, spiritual, economic, and creative dimensions of well-being. This includes finding a purpose in life, establishing meaningful social relationships, possessing sufficient functional health and adequate mobility, having enough financial resources, being respected within society, quality and provision of public services, community cohesiveness, supportive environments, as well as “smart” solutions and technologies to enhance health and well-being and empower older adults. Our researchers work with older adults and community partners to explore these different facets of age and aging – physical and cognitive (e.g. diseases and disease prevention, cognitive skills and functioning, physical well-being, sleep), social, cultural, political, and economic (e.g. social isolation, engagement, service provision, public policy, cultural differences in perceptions of aging), psychological (e.g. mental health and well-being), and technological (personal devices, advanced biomedical technologies). They also explore how sustainable design, creative arts therapies and technological innovations can be developed and used to empower older adults.

Sub-theme 3.4: Biomedical engineering and bioengineering

Concordia has extensive existing research capacity in areas that can have applications in biomedical engineering (e.g. expertise in health conditions, sensors/biosensors, computer vision, human-computer interaction, artificial intelligence, signal processing, image processing, pattern recognition, neuroimaging, computational neuroscience, materials science and nanotechnology). We also have several researchers who already conduct research on medical imaging, medical devices, lab-on-chip, and surgical innovations.

THEME 4: SECURING A SUSTAINABLE AND CARBON-NEUTRAL FUTURE

Concordia is committed to supporting the United Nations Sustainable Development Goals (SDGs) across all our activities, and this year ranked [5th in the world for Creating Smart Cities and Communities](#) in the Times Higher Education Impact Rankings (20th in the world on Climate Action). The university has made longstanding and significant efforts to support and provide resources to researchers conducting research in topics related to climate change such as: the development of alternative, renewable, and sustainable sources of energy; corporate social responsibility and sustainability; design and support of energy efficient and resilient buildings, civil structures, infrastructure, communities, and transportation; circular economy and waste management; material recovery and innovation; transportation infrastructures and logistics; decarbonization and resilience of the economy; sustainable aerospace; spill response and remediation; ecological systems; and water resource management. Concordia is home to the Canada Excellence Research Chair in *Smart, Sustainable and Resilient Communities and Cities*, the *Next-Generation Cities Institute*, and the Canada First Research Excellence Fund in *Electrifying Society: Towards Decarbonized Resilient Communities*, which explore – through interdisciplinary research and public engagement – how cities and communities can be designed and operated sustainably while maintaining necessary services for their citizens.

Sub-theme 4.1: Electrification of society

Concordia has prioritized research in disciplines and domains that accelerate progress towards decarbonized and resilient economies, cities, and communities through electrification research. Our research community responds to the urgent need to accelerate and optimize the transition to decarbonized resilient communities – which requires the design and integration of new technologies for smart grids, energy systems, energy storage, energy efficiency and management, integration of distributed energy resources and renewable energy, and electrification of transportation and buildings, among others – while emphasizing innovation, affordability, equity, inclusion, and the well-being of society. As our society is reshaped by electrification, our policies, laws, social systems, and businesses must also adapt to these profound changes. Canada urgently needs innovation and adoption of new

technologies to enable further efficient electrification based on renewable energy sources, as well as incisive research into how society will be further transformed – with respect not only to technology but also to socio-economic needs. Our expertise in this critical area can be grouped into four key topics: 1) Buildings, cities, and infrastructures (e.g. net-zero energy and carbon-neutral buildings; next-gen cities; power grids, cybersecurity); 2) Transportation/eco-mobility (e.g. electric vehicles; public transit and mobility as a service; cybersecurity; aerospace); 3) Clean technologies/green chemistry (e.g. batteries; renewable energy systems); and 4) Governance and community (e.g. social acceptance; community resiliency and engagement; knowledge dissemination; social inclusion; partnerships).

Sub-theme 4.2: Sustainable, smart, and resilient aerospace

From innovations in de-icing techniques to the development of new algorithms that increase access to flight management systems, Concordia is disrupting the aerospace industry and taking an interdisciplinary approach to training for this quickly evolving sector. Sustainable, smart, and resilient aerospace research at Concordia is multidisciplinary in nature and our researchers are focused on ever-evolving approaches, advanced technologies, and novel solutions such as integrated design of sustainable aerospace systems, industry 4.0, artificial intelligence, data cloud sharing, cybersecurity, and advanced battery materials and technologies, to create cleaner green materials, reduce emissions, and increase safety. We have strengths in advanced manufacturing and materials, aircraft configurations and propulsion, autonomous systems and space, aviation management and air transport engineering, avionics, control, and embedded systems, connectivity and autonomy, and product development and supply chains.

Sub-theme 4.3: Sustainable built environment design, living, and practices

Concordia is a leader in research touching on sustainable and healthy built environments that promote livability, access to biodiversity, decarbonized environments, and vibrant and safe communities. Our researchers focus on collaborative design and implementation of buildings, cities, and infrastructure that contribute to a better understanding of professional and human practices, policies, and community. We explore questions of sustainable design for urban living; sustainable policies and design processes; collective knowledge in the development of the built environment; design of smart high-performance carbon-neutral buildings; responsible design practices; sustainable development; corporate social responsibility and sustainable entrepreneurship; and sustainable supply chains.

Sub-theme 4.4: Sustainable natural and social systems

Conserving, restoring, and maintaining natural and social systems is essential for the wellbeing of current and future generations. Achieving the UN's 17 SDGs requires reversing trends in climate disruption, environmental degradation, biodiversity loss, and reducing social injustice. Research themes include climate change, water quality and quantity, water security, environmental impact assessment, biodiversity conservation, sustainable natural resource management, environmental justice, environmental humanities, environmental contamination, waste disposal, as well as energy, and environmental systems. Our approaches on social and political environmental histories and a commitment to inclusive decision-making positions Concordia to address these global challenges. Concordia researchers integrate these themes of coupled natural-human systems in a wide range of landscapes, including in natural, urban, and rural environments locally, regionally, and globally. Research approaches use cutting-edge methods that embrace innovative ways to overcome equity barriers and collaborate with diverse community partners. Many of these efforts correspond to pressing needs in policymaking and governance.

STRATEGIC SUPPORT FOR RESEARCH DEVELOPMENT AND MOBILIZATION

Concordia's internal funding programs include seed funding (team and individual), university research units, facilities support, research events, and Concordia University Research Chairs. These programs position Concordia to support and leverage external funding opportunities and investments. Concordia has also adopted research institutes and units as critical tools for the development of research and interdisciplinarity. The Office of the Vice-President, Research and Graduate Studies provides, in concert with the Faculties/Schools, institutional funding for major initiatives such as CFI; the Social Sciences and Humanities Research Council Partnership and Partnership Development programs; the Canada First Research Excellence Fund, the Canada Excellence Research Chairs, the New Frontiers in Research Fund Transformation, the Natural Sciences and Engineering Research Council (NSERC) CREATE and Alliance programs; and the *Fonds Recherche Québec Regroupements Stratégiques*.

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 Action Plan for the Canada Research Chairs Program specifically details key actions by the university for meeting and exceeding the targets for the four designated groups (Indigenous Peoples, Persons with Disabilities, Racialized Minorities and Women). The current equity targets and gaps may be found at: https://www.concordia.ca/content/dam/research/docs/CRC/Concordia_CRC_Equity_Target_Setting_TOL_JUNE_2021_PUBLIC.xls

Filling CRC allocations 2023-2028

A current list of CRC allocations, including vacant positions, may be found at: https://www.concordia.ca/content/dam/research/docs/CRC/Concordia_CRC_Utilization_Table_2022-12-01.pdf

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

Process, Retention and Recruitment

The current Senate-approved [Policy on Research Chairs \(VPRGS-7\)](#) stipulates that allotted CRCs be used to recruit external researchers and that a significant portion of CRC funds be invested in the Chairholder's research program. The process starts with a university-wide call for Letters of Intent (LOIs) where the strategic impact of allocating a CRC to a research area must be demonstrated, including the fit with the SRP and following the recommendations of the EDI Action Plan for CRCs. LOIs are prioritized by Faculty Research Committees (FRC) 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 LOIs, as per the Concordia University Faculty Association (CUFA) collective agreement. In general, searches are unrestricted with regards to awardees from inside Canada vs outside.

CANADIAN FOUNDATION FOR INNOVATION (CFI) ALLOCATIONS

All CFI applications must be justified considering the SRP. 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 Chairs 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.

ALLOCATIONS PER STRATEGIC RESEARCH THEME

The following table indicates the distribution of major resources amongst the four strategic research themes at the end of 2023.

Strategic Research Theme	Canada Research Chairs	Concordia University Research Chairs	Other Research Chairs	University Research Units & Infrastructure Platforms
Digital technologies and digital creativity	7	13	8	7
Inclusion and social justice	4	9	5	3
Foundations of human health and healthy living	9	16	5	10
Sustainable and carbon-neutral future	5	21	7	5
TOTAL	25	59	25	25

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 Faculties, and Concordia’s Senate Research Committee. The Plan was then approved by Senate and endorsed by the President.