

University of Calgary: Strategic Research Plan Summary

Major Objectives of the Strategic Research Plan

A Strategic Vision defines The End Goal: According to The Economist Intelligence Unit in 2013, Calgary is one of the top five places to live in the world; the New York Times named the city one of its 52 Places to go in 2014, and a 2013 Global Cities report ranked Calgary in the top 10 in the world for economic prosperity and development describing the city as one of Canada's fastest growing urban economies and one of the most innovative. This combination of quality of life and enterprising spirit distinguishes us. With this in mind, the university community redefined its mission through a strategy statement (*Eyes High*, July 2011) which states: "The University of Calgary will be a global intellectual hub located in Canada's most enterprising city. In this spirited, high-quality learning environment, students will thrive in programs made rich by research and hands-on experiences. By our fiftieth anniversary in 2016, we will be one of Canada's top five research universities, fully engaging the communities we both serve and lead." The strategy statement also outlines three foundational commitments; all of which include research and its influence:

- Sharpen focus on research and scholarship through focus, collaboration, support, translation, and attention to results.
- Enrich the quality and breadth of learning through quality instruction, programs with defined and measurable outcomes, and engaging students in research and broader experiences.
- Fully integrate the university with the community by involving the surrounding communities, leadership in city life, pride, and engagement with alumni.

The Academic Plan and the Strategic Research Plan are the Roadmaps for achieving Eyes High. The 2012 Academic Plan establishes the framework for conducting teaching and research in the university through seven key priorities: talent attraction, development, and retention; teaching and research integration; interdisciplinarity; leadership development; internationalization; connection with community; sustainability. Our objective is not only to compete with the best universities program-by-program, but also to differentiate our institution in the upper echelon of universities. Therefore, we align our areas of strength with areas of need provincially, nationally and internationally where we contribute uniquely, not only by competing with other institutions.

The Strategic Research Plan identifies the following key objectives and supporting strategies:

Objective: Match our strengths with opportunities – sharpen focus on research and scholarship

- Identify areas of established, emerging and potential research excellence.
- Use societal demands and needs for new discoveries, innovations and creative endeavors to sharpen our research focus.

Objective: Increase our research capacity through support of both people and research infrastructure

- Invest in infrastructure that enables training and innovation
- Recruit and retain talented graduate students, postdocs and academic staff members
- Integrate research experience into both undergraduate and graduate learning
- Engage all in activities of discovery, creativity and innovation
- Support and create platforms of international prominence

Objective: Create a dynamic research environment to promote research excellence

- Provide and maintain efficient services throughout the research enterprise, from inspiration through to return to community
- Identify areas of emerging research strength and invest in them to attain international prominence
- Engage our communities

Strategic Research Themes:

Through a consultative process with faculties, researchers and students, and the opportunities presented by our environment, the university has identified 6 priority strategic research themes:

- **Brain and Mental Health:** This strategic theme builds on past investments that have elevated the University of Calgary to international recognition in the neurosciences, mental health and sports-related brain injury. We will champion scholarly programs that balance prevention and early intervention across the life trajectory with innovative strategies for improved brain and mental health.
- **Energy Innovations for Today and Tomorrow:** Thanks to our location in Canada's energy capital, we have unparalleled access to corporations, decision-makers and technology receptors comprising most of the country's \$130B energy sector. This access gives rise to a unique opportunity for our university to be the leader in Canada—and one of the few global leaders—in energy research. Significant research contributions are derived from every single Faculty at the University of Calgary and are organized around a variety of alternative approaches that address key issues facing the energy sector and societal demands: discover the supplies and new sources; extract efficiently with minimal environmental impacts; export to new markets; and plan for the future.
- **Engineering Solutions for Health: Biomedical Engineering:** This strategic theme has a long history at the university and is rooted in interdisciplinary work focused on the application of engineering principles to solve problems in the health field. The university is home to a number of centres and training programs across campus where researchers are developing technologies and better treatment methods in areas such as stroke, Alzheimer's, arthritis, bone and joint conditions, heart disease, and neurological injury.
- **Infections, Inflammation and Chronic Diseases in the Changing Environment:** Understanding the complex interactions among the diverse factors that predispose individuals to and cause inflammation and/or chronic infections is a major challenge and requires a rigorous multidisciplinary approach ranging from environmental sciences, biological and nutritional sciences, animal sciences, medical sciences, epidemiology, law, population and community health, and public policy. We have internationally recognized expertise in all these areas and therefore the theme of infection, inflammation and chronic diseases in a changing environment is a natural research priority.
- **New Earth-Space Technologies:** Cutting across across faculties and disciplines, this theme builds upon the university's decades of national leadership in this field that includes more than 20 space missions. The theme integrates research strengths in the development and application of Earth-Space technologies to improve global communication networks and environmental monitoring.
- **Human Dynamics in a Changing World: Smart and Secure Cities, Societies and Cultures:** This theme brings together researchers interested in urban growth, multiculturalism, transportation challenges, sustainable resource use and the desire for a rich social environment. Research contributions from across many disciplines will improve the quality of life for citizens of growing metropolises around the world, significantly influence development and policies of our built environments and surrounding ecosystem, create new generations of urban spaces and provide creative expressions of important social issues.

All strategic research themes are characterized by several important features: 1) we are leaders in the area, as demonstrated by a local critical mass of expertise, and we have attained national or international prominence, 2) we are an essential hub in provincial, national, or global research networks for the area, 3) we have built strong industrial or community (philanthropic) partnerships in the area, and 4) our advances benefit from enabling research platforms and improve these platforms. More detailed descriptions of all of the theme areas can be found on the University of Calgary [website](#).

In addition to the six strategic research themes, the university has identified seven research platforms, organized scholarly activities that are truly crosscutting and are catalysts in the creation or application of new knowledge:

- **Synthesis and Visualization:** Researchers in this platform area work on a wide variety of topics ranging from inventing and improving data capture technologies, extracting data from narrative for analysis in humanities and social sciences, high-performance computing for synthesis, to visualization.
- **Analytics and Simulation:** The related platform of Analytics and Simulation makes sense of vast amounts of data and applies this insight to solving problems such as simulating behavioural models for designing new health units, constructing transportation pathways in urban environments, or understanding the flow of hydrocarbons in deep reservoirs experiencing influx of steam or chemical catalyst.
- **Research Stations:** Our existing research stations draw scholars from around the world to conduct research of the highest caliber, and to educate students from all levels. The university continues to explore ideas for novel research stations that will provide opportunities for students and scholars to test their ideas in different settings and participate in courses across a wide range of disciplines.
- **Research Enablers:** This platform ensures that the university continues to invest to improve our systems and facilities as well as advance research in areas such as animal care, ethics in human subject research, financial and conflict of interest compliance, and governance.
- **Commercialization:** This platform support initiatives designed to bridge the gap between discovery and innovation. Innovate Calgary has emerged as one of our commercialization platforms that assists our scholars in technology transfer, licensing, and company creation and we continue to explore alternative models for commercialization platforms in partnership with investors and Alberta Innovates.
- **Knowledge Translation:** The gap between research and the practical application of the resulting knowledge is addressed in this platform by providing researchers with links to community partners and industrial collaborators.
- **Policy Creation:** This platform draws together synthesis and analysis of information to advance public discussions of policy and to promote critical evaluation of policy alternatives.

Institutional Support to Priority Areas

The university has developed priority focus areas with the goal of enabling teams to address complex, multidisciplinary problems. Significant institutional support for these initiatives has come through allocation of CRCs, CFI JELFs, CFI IF, significant fundraising (over \$800M since 2005) and targeted investment to support people, programs and infrastructure. A 2012 University investment brought an additional 85 postdoctoral scholars to campus, approximately 80% of whom have been recruited into priority areas. A 2013 University investment of more than \$3M was made for networking, research and commercialization collaborations within “Energy Innovations for Today and Tomorrow”.

In addition to investments in people and programs, the university has made considerable investments in interdisciplinary platform infrastructure that enables novel approaches to research and innovation. Notable examples include: the Energy, Environment, and Experiential Learning (EEEL) building with science and engineering space to foster student projects and multi-disciplinary research; the Taylor Family Digital Library with state-of-the-art infrastructure for data management, analysis and visualization to facilitate opportunities for all types of imaging; and the Ward of the 21st Century, which houses infrastructure to improve technological innovation and knowledge translation in health care delivery.

Chairs and CFI opportunities have been allocated to our priority themes for several years, and allocation plans for future rounds of CRC and CFI are consistent with this approach. Future allocation requests for these opportunities include review of alignment with strategic priorities and strengths, while allowing for growth in emerging areas. The table below shows the CFI and CRC allocations currently held by these strategic research themes.

Existing CFI Awards and Funding and existing and planned CRC Awards and Allocations (planned allocations are in brackets)

Theme	CFI Awards	CFI Funding	CRC Tier I	CRC Tier II
Biomedical Engineering	37	\$29.1M	4 (3)	1(5)
Brain and Mental Health	22	\$17.8M	3 (1)	4(3)
Energy Innovations for Today and Tomorrow	30	\$24.2M	7(0)	7(4)
Infections, Inflammation and Chronic Diseases in the Changing Environment	55	\$37.7M	8(2)	5(3)
New Earth-Space Technologies	28	\$23.2M	1(1)	3(0)
Human Dynamics in a Changing World	17	\$3.8M	3(1)	6(7)

Planned allocations include expected renewals along with Chairs currently vacated or soon to be vacated due to term expiration or retirement.

In addition to the allocations held by strategic research priorities, 2 Canada Research Chairs and 40 CFI projects totaling more than \$10M are held within areas of emerging research strength. There are 7 chairs becoming available in the next 2 years that are not yet allocated to a specific priority theme: 2 NSERC Tier Is, 1 CIHR Tier II, 3 NSERC Tier IIs and 1 SSHRC Tier II. These allocations will be carried out using a competitive internal process, ensuring Chairs are placed in areas in which they will provide the most impact.

Gender representation in CRC nominations

The University of Calgary’s CRC nomination process is guided by the institutional “Workplace Diversity & Employment Equity Strategy”. This strategy is to ensure the University hires the best-qualified candidate while removing barriers to overcome discrimination in the hiring process. The University is currently below the target set for 2012 (with a gap of 4), but through the cooperation and commitment of the faculties and the Office of the Vice-President (Research) the goal to increase the number of female Chairholders is attainable. To assist in improving the quality of the recruitment process, the University is committed to ensuring equitable representation of women on the Strategic University Proposal and Platform Opportunity Review Team (SUPPORT) committee for the internal review of all nominated candidates brought forward by the faculties.

Inter-institutional and Inter-sectoral Collaborations

Research at the University of Calgary is strengthened through its many research centres and institutes, partnership institutes, and through its participation in Networks of Centres of Excellence and Strategic Networks (over 80 in total). These structures greatly enhance the success of interdisciplinary approaches to the solution of research problems and the understanding of complex phenomena.

Some notable examples of existing partnerships include:

Advancing Canadian Wastewater Assets (ACWA) is a partnership between the University of Calgary and The City of Calgary. ACWA’s infrastructure is embedded within The City's Pine Creek Wastewater Treatment facility and includes advanced, large scale wastewater treatment processes and 12 replicate, experimental streams that can be dosed with various constituents of municipal effluents. Together these facilities will be used to demonstrate advanced treatment techniques and the impact of the resultant effluent on the environment.

The Resolute Bay Incoherent Scatter Radar (RISR) is a US-Canada initiative to develop a phased array Incoherent Scatter Radar in Canada’s arctic to study the atmosphere and aurora. The university leads the Canadian RISR consortium which includes space and atmospheric physics, geomatics, and radio astronomy at UC, AU, USask, York, UNB, UWO. The primary US partner is SRI International, with involvement from MIT, Cornell, and UAlaska.

The Snyder Institute for Chronic Diseases is one example of a partnership institute between the university and Alberta Health Services. It was established to conduct basic and applied research in order to change the lives of

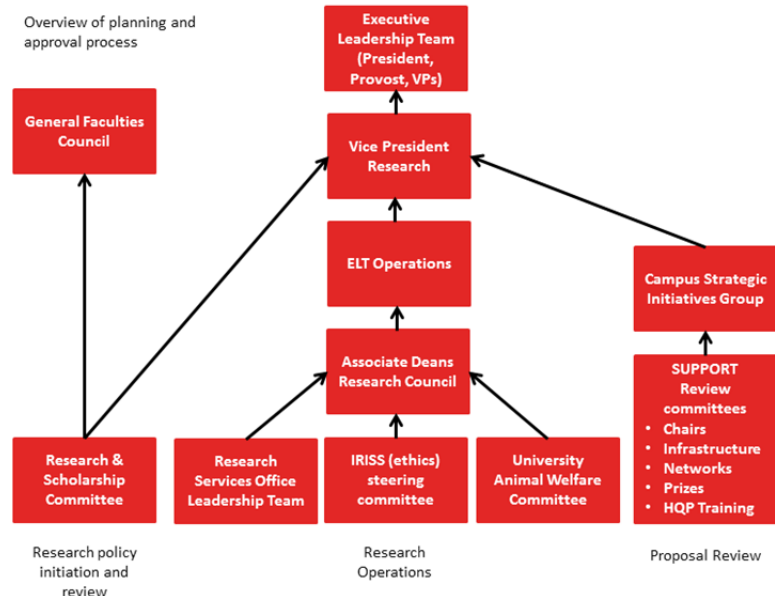
people suffering from chronic diseases, including sepsis, MRSA, cystic fibrosis, diabetes, inflammatory bowel disease, and chronic obstructive pulmonary disease.

We will build upon the success of these institutes, centres and networks and to create structures that will allow research units to share information and implement strategies for success more easily.

Planning and Approval Process at the University

The framework for planning and approval (summarized in the diagram) guides the development of all major university initiatives and policies. The planning and approval process ensures that funded initiatives are implemented effectively, limiting institutional risk while allowing researchers to meet their objectives.

Initiatives such as the *Eyes High* strategy statement, Academic Plan and Strategic Research Plan are driven by broader consultation that then feeds into the approval process. *Eyes High* involved three months of consultation with faculty, staff, students, and community to discuss strategy and priorities. Input was combined with information from internal and external strategy documents, to ensure the university's goals are aligned with that of our partners. The current Academic Plan and Strategic Research Plan were developed by an initial consultation with Deans and student leaders. Their feedback was used to produce a draft document that went out for review and feedback by academic, support staff and students. Final approval was facilitated through the general approval process.



The major planning and approval committees are:

Campus Strategic Initiatives Group (CSIG): CSIG is composed of Associate Vice Presidents from the Research, Academic, Development, Campus Infrastructure, Finance and Service, and Legal portfolios. This group reviews all new major proposals to assess alignment with institutional priorities and risk.

General Faculties Council (GFC): GFC is the voice of the academic community, approving research policy and priorities and offering advice to other decision-makers on issues touching upon the academic work of the university. Consultation and collaboration with GFC ensures a clear articulation of institutional goals and priorities, thereby creating a policy framework within which planning occurs.

Associate Deans Research Council (ADRC): ADRC is an advisory body to the Vice President Research on matters pertaining to research. It is an essential venue for discussion of the integration of Faculty priorities within an Institutional context. Consultation and collaboration with ADRC includes recommendations on research priorities and policies, and defining, measuring, promoting and rewarding research excellence.

Strategic University Proposal and Platform Opportunity Review Team (SUPPORT): SUPPORT makes recommendations to the Vice President Research regarding the strategic allocation of such opportunities as CFI, CRC, Campus Alberta Innovation Program Chairs, and other sources of major infrastructure and operating funds. In addition, the SUPPORT process provides feedback to applicants in order to improve the quality of applications. This committee is comprised of faculty members from across campus, the Vice President Research or Associate Vice President Research, along with representatives from service units responsible for implementation, such as Campus Planning and Facilities Development.