Impact Together
Dalhousie's Research & Innovation Strategic Direction (2018)
Summary

Introduction

Dalhousie is a vibrant hub with regional, national and global impact, recognized for the outstanding quality of its research and innovation. In Nova Scotia alone, Dalhousie generates nearly $1 billion in economic benefits each year. The university attracts more than 19,000 high achieving, motivated and engaged students from around the world to its four campuses. In its more than 190 undergraduate and graduate programs across 13 faculties, Dalhousie provides a unique, interactive and collaborative environment for creating and sharing knowledge, supported by research funding from governments, industry and non-governmental organizations.

Impact Together, Dalhousie's Research and Innovation Strategic Direction, 2018-2023, serves as a guide for the allocation of research and innovation resources in the years ahead. It is a strategy grounded in discovery, innovation and impact, designed to ensure that the university's research activities have an even stronger influence on the local, regional and global landscape.

Research Vision, Mission, and Values

Vision: We are a leading innovative, research-intensive university, inspiring our diverse scholarly community to serve Nova Scotia, our region, our nation and our world.

Research Mission: To create a hub of world-leading research and innovation, adding to the intellectual, social and economic capital of our communities.

Equity, Diversity and Inclusiveness: Equity, diversity and inclusiveness (EDI) are firmly implanted within Dalhousie's strategic priorities. The university has introduced a wide-reaching Diversity & Inclusiveness Strategy, which includes initiatives focused on employment equity. The Research and Innovation Enterprise at Dalhousie will propel research and innovation excellence across all disciplines, fully aligned with the university's EDI goals.

Dalhousie's research initiatives are driven by the following *Values*:
- Responsible conduct of research: Dalhousie researchers are committed to the ethical conduct of research.
- Collaborating across disciplines: Dalhousie researchers seek opportunities for collaboration and recognize that new perspectives enrich research insights.
- Training the next generation of researchers: Dalhousie University is committed to providing opportunities and mentorship to tomorrow's research leaders.
- Mobilizing knowledge to sustain change: Dalhousie researchers seek solutions to today's most pressing research challenges in an effort to create sustainable, positive change.
- Partnering with the world: Dalhousie University partners with the world's best, engaging with research leaders at universities, institutes and the private sector around the globe.

Strategic Implementation Goals
Dalhousie University's strategic research implementation goals are categorized within four Priorities:

We will **propel** research excellence by attracting and retaining the best researchers and graduate students while fostering diversity, all with the ultimate aim of addressing global challenges and national priorities with interdisciplinary teams.

We will **connect** across disciplines and enhance the integration of research and education.

We will **partner** with the world's best and will seek opportunities that build and expand relationships with industry and government locally, regionally and internationally.

We will drive **impact** through translational research and innovation, leveraging research to drive social, cultural and economic development.

These Priorities are supported by the following Goals, and progress will be assessed via specific Strategies:

Goals	*Examples of Strategies*
Attract and retain the best researchers	Grow external research funding, align resources and recruitment planning, support early career researchers
Attract and launch the best graduate students	Develop and resource a strategy to recruit PhD students, expand graduate programming, improve graduate student funding, connect graduate students with research partners
Promote and support solution-based, cross-disciplinary research teams	Facilitate and promote cross-disciplinary teams, extend the reach, scale and profile of centres and institutes, create internal funding opportunities for interdisciplinary research
Foster a culture of mentorship and peer review	Support research development and mentorship, establish and promote formal peer-review programs for grant applications
Enhance research collaborations with international partners	Identify, develop and support international research partnerships, identify and create opportunities with international research networks
Engage more industry partners	Align and optimize existing resources for maximum impact, increase opportunities to support industry partnership grant applications
Foster and grow government relationships	Promote and strengthen partnerships with government research and organizations, including Indigenous governments
Increase and leverage research to drive social, cultural and environmental development	Evaluate, identify and promote social, cultural and environmental innovation and impact
Increase and leverage research to drive economic development	Evaluate and identify mechanisms to enhance impact and grow start-ups and companies
Inform policy creation through research	Consolidate, enhance and encourage the pursuit of national and international public policy initiatives

Signature Research Clusters
Grounded in the UN Sustainable Development Goals (SDGs) for 2030, Dalhousie's research efforts focus on five Signature Research Clusters:

- **Sustainable Ocean** (SDGs #1,2,8,9,10,11,12,13,14,17)
- **Healthy People, Healthy Communities, Healthy Populations** (SDGs #1,3,5,10,11,17)
- **Clean Tech, Energy, the Environment** (SDGs #6,7,9,11,12,13,14,15,17)
- **Culture, Society, Community Development** (SDGs #1,4,5,8,10,11,16,17)
- **Food Security** (SDGs #1,2,3,6,10,12,13,14,15,17)

The Signature Research Clusters are informed by two cross-cutting themes: **Big Data** (SDGs #4,8,9,12,16,17) and **Innovation & Entrepreneurship** (SDGs #8,9,16,17).

Sustainable Ocean: The ocean is integral to Canada's economy, culture, transportation and sustenance. Dalhousie has established itself as a world leader in ocean research, and from innovative tracking of marine species to ocean governance, our ocean researchers drive breakthrough discoveries every day. Dalhousie's multidisciplinary approach and involvement in international research projects including the Ocean Frontier Institute (OFI); Ocean Supercluster; Ocean Tracking Network (OTN); Marine Environmental Observation, Prediction and Response (MEOPAR), and others allows Dalhousie researchers to contribute to the most pressing ocean challenges of our time.

Research Focus Areas:
- Changing climate effects on the ocean
- Sustainable aquaculture and agro-ecosystems
- Sensors, analytics and autonomous vehicles
- Ocean engineering, networks, communications, materials and tidal energy
- Marine and environmental law, policy and governance
- Cultural and social development of coastal landscapes and communities
- Marine risk evaluation

Healthy People, Healthy Communities, Healthy Populations: From world-leading vaccine research to the investigation of the social, cultural and environmental determinants of health and wellness, Dalhousie's approach to health research is grounded in an understanding that the health of individuals, communities and populations are interconnected and interdependent. Dalhousie is the major training centre in the Maritimes for life sciences, health professions and health law and policy research personnel. Research in this area involves work done a wide range of Faculties at Dalhousie as well as provincial health departments, hospitals, research institutes and research foundations.

Research Focus Areas:
- Infection, immunity, inflammation and vaccinology
- Genomics, bioinformatics and health
- Community, population and Indigenous health and well-being
- Primary and continuing care transformation
- Mental health, resilience and health equity
- Chronic disease prevention, treatment and management across the lifespan
- Body function and mobility
- Neuroscience and brain function
- Health data analytics, AI and technologies
- Critical health, health law, health policy and bioethics

Clean Tech, Energy, the Environment: Managing and developing new and renewable energy resources while minimizing their environmental impact is one of our world's most pressing challenges. Dalhousie is a national and international leader in advanced materials and clean technology research, with world-renowned researchers developing products that improve performance, productivity and efficiency while at the same time reducing costs, energy consumption and waste.

Research Focus Areas:
- Renewable energy generation, storage and fuels
- Energy security
- Clean water, clean soil, clean air
- Clean and NextGen materials
- Sensors, AI and data streams
- Social and biophysical dimensions of resource and environmental sustainability

Culture, Society, Community Development: How does social justice define what we do? What can we do to amplify marginalized voices? How can digital media be harnessed to create community? These are just some of the questions being tackled by Dalhousie researchers, as they use their research to inform our most pressing conversations about culture and community. The interdisciplinary nature of this area engages all Faculties across the university.

Research Focus Areas:
- Culture and identity
- Ethics and social justice
- Reconciliation and Indigenous peoples
- Governance, security and global affairs
- Building diverse, sustainable, responsible, smart organizations and communities
- AI, privacy, ethics and social impact
- Immigration and migration settlement and integration
- Development of Indigenous and rural communities

Food Security: Access to sustainable, secure food resources poses challenges and creates instability around the globe. Dalhousie researchers are creating solutions that emerge from a deep understanding of local food issues—and that provide potential solutions for global food challenges.

Research Focus Areas:
- Sustainable aquaculture and agro-ecosystems
- Applied molecular biology, genomics and biotechnology
- Marine biodiversity and wild catch fisheries
- Bio-products and bio-resources
- Agri-food economics, business, trade and marketing
- International development, agriculture, and food technology
- Food policy, access and distribution

Cross-Cutting Themes
Big Data: Dalhousie's expertise in the collection, use, analysis and interpretation of big data enables new opportunities for research, analysis and insight in all of the university's Signature Research Clusters.

Research Focus Areas:
- Data science
- Machine learning, analytics and big data
- Information systems, cloud and web-scale computing
- Data-driven decision- and policy-making; social, behavioral, and business analytics; and the management of data
- Law, technology, and ethical use of data

Innovation and Entrepreneurship: Dalhousie's strengths in innovation and entrepreneurship facilitate opportunities for collaboration between companies and university researchers and help drive the commercialization of research.
Research Focus Areas:
- Technical leadership and innovation management
- Software design for rapid innovation
- Disrupting through innovation and entrepreneurship
- Sustainable and social entrepreneurship
- Business law

Dalhousie University Canada Research Chairs by Priority Research Cluster:

Priority Research Cluster	Tier 1 CRCs	Tier 2 CRCs	Total CRCs
Sustainable Ocean	6	10	16
Healthy People, Healthy Communities, Healthy Populations	8	12	20
Clean Tech, Energy, the Environment	3	3	6
Culture, Society, Community Development	0	3	3
Food Security	0	1	1
Cross-Cutting Themes (Big Data and Innovation and Entrepreneurship)	1	2	3
Total	**18**	**31**	**49**

*Numbers as of September 2018

The University strategically selects its CRCs by aligning them with its Strategic Directions. Dalhousie nominates individuals whose work will enhance an area of research within the Strategic Directions and are aligned with its collaborative, cross-cutting research environment. The majority of Dalhousie's CRC allocations are used for external hires of the most qualified people, whether they have a national or international background.

Dalhousie has developed an EDI Action Plan to monitor and track progress towards meeting its EDI targets. The university is committed to attracting, recruiting and retaining members from traditionally under-represented groups, including Indigenous people, persons with a disability, racially visible persons and women.

Planning and Approval Process
This Strategic Direction is the result of an inclusive and collaborative planning process that engaged more than 400 faculty members, and numerous students, staff, affiliated hospitals and external partners in impact sessions, summits, surveys, submissions and consultations. Individual faculties were also engaged as the direction developed. Supported by the President and senior administration, the Strategic Direction was presented to Senate and the Board of Governors in Fall 2018.