

## **CANADA RESEARCH CHAIR – CANADA FOUNDATION FOR INNOVATION: STRATEGIC RESEARCH PLAN SUMMARY**

As a comprehensive university, the University of Lethbridge articulates unwavering commitment to the principles of liberal education. Our undergraduate and graduate programs span numerous disciplines across five faculties. Our students are inspired, both in the classroom and at the laboratory bench, by some of the country's leading academic scholars who are recognized by their achievements in teaching excellence, scientific inquiry, creative expression, and community citizenship. From this unique vantage, we proudly distinguish ourselves as an institution where synergies between teaching and research are placed amongst the highest of academic ideals. In realizing the Strategic Research Plan (SRP), our major objectives are to:

- Cultivate creativity and innovation.
- Promote and facilitate disciplinary and institutional collaborations.
- Build units of research excellence relevant to regional, national, or global significance.
- Resource emerging areas of research concentration.
- Support freedom of thought and original scholarly outcomes.
- Facilitate effective knowledge translation and communication.
- Sustain international acclaim.
- Inspire our students.
- Engage our local community.
- Provide benefit to humanity and the natural world

The Strategic Research Plan of University of Lethbridge outlines, at a very high level, the strategic priorities that will pave the direction and inform the research focus of the University of Lethbridge in our expanded mission as a comprehensive university. Our roadmap for the journey is built on three fundamental values:

1. Upholding a tradition of excellence in research, scholarship and creative activity. The research history of the University of Lethbridge reflects our commitment to the creativity and curiosity of individual researchers and our investments in strategic and targeted intensity in areas of research within and across disciplinary boundaries. These strategies have provided a distinctive edge and have proven to be the means by which we have marked our position and achieved international status. As we move forward, we will draw from this history and we will continue to embrace distinctiveness and we will continue to cultivate excellence. Our strategy in this regard will be the selective investment in existing and emerging areas of research, scholarship and creative activity.
2. Growing our community of scholars. Our tradition of excellence in research has been achieved by the collective achievements of our community of scholars. This tradition is fostered internally, by our commitment to recruit and retain outstanding scholars, our commitment to the scholarly development of our junior faculty, and our commitment to providing our students with an educational experience that is enhanced by the research activity at our institution.
3. Translating outcomes for the greater good. The community of scholars at the University of Lethbridge produces innovative outcomes that hold prominence in defining the socio-cultural and economic landscapes of our local communities and contribute to the prosperity and international competitiveness of Alberta and Canada. At the University of Lethbridge we view innovation as the creation of outcomes that provide solutions to problems and add new value.

We support the translation of knowledge outcomes to the products and applications that bolster Alberta's social, cultural and economic prosperity, but we are equally invested in the knowledge outcomes that inspire curiosity and perpetuate the research process.

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## SUMMARY OF RESEARCH PRIORITIES

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The University of Lethbridge's priority areas incorporate: CREATIVITY AND PERFORMANCE, EARTH AND ENVIRONMENT, HEALTHY FUTURES, ORIGINS, EXPLORATIONS & ENTERPRISE, and ORGANIZATIONS, CULTURE AND SOCIETY. These research pillars transcend disciplinary boundaries and position the University of Lethbridge to continue to confirm excellence of scholarship that defines our institution. A full description of these pillars will be available on the Vice-President Research's web site.

### **CREATIVITY AND PERFORMANCE**

This theme recognizes research at the intersection of art, culture and society. It builds on the University of Lethbridge's strength in visual arts by incorporating traditional and emerging media, including digital and interactive media. Through collaborative efforts with other disciplines, research explores the connections of movement and performance, both athletic and artistic, and its implications on group identity and popular culture.

### **EARTH AND ENVIRONMENT**

This research theme is built on a foundation of understanding the earth, its resources and its sustainability. The University of Lethbridge has long focused on the issues of sustainability, development and globalization and will continue to explore and resolve the interconnected problems revolving around demographics, economics and environmental sustainability.

### **ORIGINS, EXPLORATIONS & ENTERPRISE**

The University of Lethbridge is dedicated to explorations of the most basic questions of life, humanity and the universe. From the origins of human cultures to the creation of galaxies, our researchers probe thought, understanding and reason to provide the numerical, literary and computational discourse to advance theory, critique contemporary and historical frameworks, synthesize new materials, create novel devices, and solve complex problems.

### **HEALTHY FUTURES**

This research theme is built on an integrated approach to health and wellness that incorporates a range of disciplines including the social sciences, natural sciences, health sciences and education. Research topics range from the discovery of causes and cures for disease to the health of individuals, families and communities.

### **ORGANIZATIONS, CULTURE AND SOCIETY**

This theme of research explores the multifaceted relationships that exist between people, cultures and places and organizations. Our current capabilities are founded on scholarship that seeks to provide insight into how individuals, groups, organizations and institutions relate to one another as well as the ethos and processes that shape society and civilization.

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## CURRENT CANADA RESEARCH CHAIRS

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Dr. Susan McDaniel Tier I CRC in Global Population & Life Course.

Research Pillars: Organizations, Culture & Society; Healthy Futures

Dr. McDaniel is the Director for the Prentice Institute for Global Population and Economy. The Prentice Institute and its research collaborators seek to understand long-term changes in the human and economic environments, with particular attention to the role human actions play in influencing those outcomes. Through integrated research on the dynamics of Canadian and global demography and their impacts on economic well-being through migration, culture, trade and natural resource availability, the Institute will stimulate further research and enable better informed decisions of individuals, governments, and corporations.

Dr. Joseph Rasmussen Tier I CRC in Aquatic Ecosystems.

Research Pillars: Earth & Environment; Origins, Explorations & Enterprise

The goal of Dr. Rasmussen's Chair is to stimulate awareness and interest in the subject area of freshwater ecology. His research focuses on the impact of human activities on the functioning of aquatic ecosystems, with special reference to fish and their role in aquatic food webs. Much of Dr. Rasmussen's research has involved the application of stable isotopes and other natural source tracers to comparative field studies in aquatic ecology. The objectives of his research programs are to:

- Develop models for productive capacity in regulated rivers,
- Determine the effects of river fragmentation, and the need for fish passage,
- Examine gradient-based mixing models of energy flows and subsidies in rivers,
- Investigate the impact of introduced brook trout on native bull trout populations,
- Study the effects of mining on fisheries resources.

Dr. Alice Hontela Tier I CRC in Ecotoxicology

Research Pillars: Earth & Environment; Origins, Explorations & Enterprise

Dr. Hontela's research program focuses on one of the most important environmental issues we face today - the effects of pollutants (pesticides, metals, pharmaceuticals) on health of non-target species, animals that may be continually exposed to low level concentrations of these chemicals in the wild. Dr. Hontela's general area of interest is Endocrine Toxicology study of the effects of toxicants on the endocrine system that regulates physiological functions through hormones. Specifically, she is investigating in teleost fishes and amphibians the effects of pollutants on the adrenal function and corticosteroid hormones such as cortisol and corticosterone. These hormones have an important role in metabolism, osmoregulation and the immune function. Some environmental pollutants disrupt the intracellular pathways leading to synthesis of corticosteroids, with consequences on animal's health.

Ongoing studies in Dr. Hontela's laboratory focus on health assessment of aquatic species exposed to agri-chemicals and metals such as selenium, in Western Canada and investigations of the mechanisms through which adrenotoxic chemicals interfere with the normal synthesis of corticosteroid hormones. Field studies, together with in vitro bioassays and pharmacological tests are used to better understand the effects of specific pollutants on the endocrine system of fish and amphibians. Data from such studies are needed for Ecological Risk Assessment, the process evaluating safety of new chemicals released into the aquatic environment.

Dr. Henning Bjornlund Tier II CRC in Water & the Economy – International

Research Pillars: Earth & Environment; Organizations, Culture and Society; Healthy Futures

Henning Bjornlund holds two academic positions; he is a Canada Research Chair in Water and the Economy – International at University of Lethbridge, Alberta, Canada and an Associate Research Professor at the University of South Australia. He has researched water management and policy issues in Australia since 1993 and in Canada since 2005. His current research interests are water markets, socioeconomic impact of water markets, economic instruments of water resources, water conservation, monitoring, water market prices, water rights, and the property implications of water policy.

Dr. Bjornlund is currently leading six interdisciplinary research projects in Australia, Canada and Oman to a total grant value of about \$4 million. His work on water markets in Australia has had a significant impact on policy development in that country. In Alberta he is currently providing significant input into the process of developing a new water allocation and management policy in Alberta.

#### Dr. Stacey Wetmore Tier II in Computational Chemistry

Research Pillars: Origins, Explorations & Enterprise; Healthy Futures

The governing goal of Dr. Wetmore's research program is to understand deoxyribonucleic acid (DNA) damage and repair processes in order to gain insight into the prevention of life-threatening illnesses. Dr. Wetmore's research falls under a branch of chemistry known as computational chemistry. It uses calculations on computers to study the structure, properties and reactions of chemical systems instead of using laboratory experiments. The immediate goals of Dr. Wetmore's research program revolve around using computer modeling to: 1) identify DNA damage products and mechanisms for their formation and 2) understand natural DNA repair mechanisms. Computer calculations are becoming increasingly important tools in chemical, biochemical and medicinal research due to the unique information they provide which complements experimental data. With the tools of computational chemistry, Dr. Wetmore is also studying modified DNA and protein components for use as bioprobes as diagnostic measures and future therapeutics, which could have major implications for the health of Canadians.

#### Dr. Claudia Gonzalez Tier II Chair in Human Movement Performance

Research Pillars: Origins, Explorations & Enterprise; Healthy Futures

The goal of Dr. Gonzalez's research program is to uncover the specific roles of the left and right hemispheres in the integration of sensory (vision, touch and proprioception) and motor information for the production of skilled movements. Her work will help advance the understanding of the behavioural features and the neural correlates of goal-directed actions. Furthermore, this pioneering work expands our current knowledge of cerebral asymmetries and provides valuable insights concerning the origins of handedness. Importantly, by discovering the contributions of each hemisphere to the control of skilled movements, tremendous progress will be made in understanding the nature of specific motor deficits that derive from left or right hemisphere damage. The theory that Dr. Gonzalez investigates is that the left hemisphere might be more specialized in visuomotor control than the right hemisphere. The work that Dr. Gonzalez and her team are currently conducting holds promise of providing novel perspectives for treating brain injuries.

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## FUTURE CANADA RESEARCH CHAIRS

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The University of Lethbridge submitted two applications from internal candidates in the April 2011 competition: A Tier II Chair in Earth surface Dynamics and a Tier I Chair in Cognition, Evolution and

Behaviour. Our Institution has two, Tier II Chairs remaining in its allocation. The Office of the Vice President Research is currently soliciting proposals to fill these Chairs. Individual faculty members, Departments, Research Centres/Institutes, or informal academic teams are being encouraged to apply. Submissions that outline opportunities for the arts, social sciences or humanities are also encouraged. The University's Research Committee will shortlist five candidates by Nov 1 and a final decision will be made by Dec 20. The University will submit application(s) in the April 2012 competition for internal candidates, or the April 2013 competition for external candidates.

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#### ASSESSMENT OF OBJECTIVES

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The University is committed to the highest academic ideals, to free and original research, scholarship and creative work, and the sharing of that work and its products with all people but especially with students at the University. To support our Strategic Research Plan, The Vice-President Research is preparing a number of strategic research initiatives that articulate specific roadmaps and strategies for each of our themes. Finally, the success at meeting our objectives will be assessed by indexes of quality such as peer-reviewed publications, citation indexes, conferences, presentations, exhibitions and performances.

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#### PLANNING AND APPROVAL PROCESS

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This submitted Strategic Research Plan was developed through consultation with Faculty Deans, Institute Directors, Senior Administration and individual faculty members.

