

**Approved Project Listing for the  
Alberta Science and Research Investments Program  
2003/2004**

**University of Alberta: \$16,130,127**

**Project:** 04-009 – Prototype Implementation for the Alberta Biodiversity Monitoring Program (Stan Boutin)

**Description:** The Alberta Biodiversity Monitoring Program is a university, industry, and government partnership program to survey biodiversity and habitats throughout Alberta. The protection of biodiversity from the cumulative effects of human development is important to the competitiveness of Alberta industries. Market forces demand that protection of ecosystems be clearly demonstrated as a condition of product sales. To this end, this broad scale monitoring program will be capable of detecting slow changes in biodiversity and will relate those to changes in human activities so that negative trends can be reversed before expensive recovery programs are needed.

**ASRIP funding:** \$600,000 (*Enabling Research Application and Technology*)

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**Project:** 04-010 – Toward Developing a Vaccine that Inhibits Engorgement of Ticks (Reuben Kaufman)

**Description:** Ticks and tick-borne diseases affect up to 80% of the world's cattle population causing higher mortality and decreased productivity in cattle populations. Currently the primary control strategy is pesticide use. An effective vaccine could reduce the cost of tick control, improve cattle protection and save the cattle industry in Alberta millions of dollars. Dr. Kaufmann has discovered a protein that has been effective in vaccinating rabbits against tick infestations. This project will conduct experiments necessary to move to field trials for developing an anti-tick vaccine.

**ASRIP funding:** \$78,273 (*Enabling Research Application and Technology*)

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**Project:** 04-021 – Centre of Excellence for Gastrointestinal Inflammation and Immunity Research (Richard Fedorak)

**Description:** The Centre of Excellence for Gastrointestinal Inflammation and Immunity Research will support a multi-disciplinary team of medical scientists in examining the environmental, microbial, immunological and genetic factors that cause the gastrointestinal disorders and related cancers that afflict 60 percent of Canadians in their lifetime. The current team of internationally respected scientists aims to produce novel treatments and clinical advances in GI treatment, and create a unique and internationally recognized center for GI research that will attract recognized researchers and emerging expertise to Alberta.

**ASRIP funding:** \$ 4,605,013 (*Research Infrastructure*)

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**Project:** 04-031 – Cardiovascular Translational Research Centre (Gary Lopaschuk)

**Description:** The Cardiovascular Translational Research Centre (CVTRC) is an innovative project to facilitate the development of new therapeutic strategies to improve the outcome of cardiac surgery. The research has a strong translational focus, which will result in research advances being rapidly translated into optimal clinical care for the cardiac patient. The CVTRC has two components, a Therapeutics Facility for clinical research and a Cardiac Analysis Facility for small animal studies.

**ASRIP funding:** \$ 2,500,000 (*Research Infrastructure*)

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**Project:** 04-032 – Integrated Nanosystems Research Facility (David Lynch)

**Description:** Nanotechnology has the potential for tremendous opportunities in the development of technology ranging from new kinds of transistors and data storage devices, ultra hard materials for oilsands extraction and mining, to targeted drug delivery. The Integrated Nanosystems Research Facility (INRF) will consist of four components that will encompass fabricating nanomaterials, the self-assembly and synthesis of molecules, nanoscale manipulation and the computing power to model, design and visualize nanosystems. The internationally recognized team of scientists using the broad-based platform provided by INRF is well positioned to create key innovations that will impact our daily lives in a multitude of ways, from improved medical diagnostic systems to the development of fuel-cell technology.

**ASRIP funding:** \$ 4,883,118 (*Research Infrastructure*)

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**Project:** 04-033 – Oil Sands and Coal Interfacial Engineering Facility (Jacob Masliyah)

**Description:** The Oil Sands and Coal Interfacial Engineering Facility is a state-of-the-art facility supporting research to develop step-out technologies in oil sands processing, bitumen extraction and upgrading, producing clean energy from coal, environmental impact minimization and improved water utilization. These issues are approached at the micro- and nano-scale and have the potential to revolutionize bitumen extraction and upgrading, creating a process that minimizes environmental impacts and is less energy intensive and less burdensome to the natural water resources.

**ASRIP funding:** \$1,429,669 (*Research Infrastructure*)

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**Project:** 04-036 – Nanophotonics Microscopy Unit (Al Meldrum)

**Description:** The Nanophotonics Microscopy Unit (NMU) will be a state-of-the-art laboratory for ultra-fine-scale characterization of materials for nanotechnology. The customized system will be sensitive enough to perform measurements on individual nanoparticles and flexible enough to perform a wide range of optical experiments on a microscopic scale. Research in this emerging area could lead to the replacement of electronic signalling with optical techniques, increasing the speed and bandwidth of information technologies. The instrumentation will tie in well with the planned capabilities at the National Institute of Nanotechnology.

**ASRIP funding:** \$152,000 (*Research Infrastructure*)

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**Project:** 04-037 – Agricultural Genomics and Proteomics Centre (Stephen Moore)

**Description:** The Agricultural Genomics and Proteomics Centre will provide instrumentation that will be among the most sophisticated in the world for agriculture-based genomics and proteomics. The centre will position Alberta, Canada's second largest agricultural economy and leading beef producer, to be at the forefront of international science in these rapidly emerging fields. The infrastructure will enable the world-class researchers at the University of Alberta to identify genes and related proteins affecting processes in animal agriculture that are highly relevant to industry, including growth, waste production, and efficient nutrient utilization.

**ASRIP funding:** \$1,100,000 (*Research Infrastructure*)

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**Project:** 04-042 – Field Facility to Support Ecosystem Management Emulating Natural Disturbances (John Spence)

**Description:** Ecosystem Management Emulating Natural Disturbances (EMEND), an innovative long-term experiment in sustainable forest management, is one of the largest manipulative forestry experiments worldwide. The support and laboratory facility enables the use of specialized research equipment, facilitating field work and providing a safe and efficient work environment at the remote field site in northwestern Alberta. The research seeks to understand the impact forest harvest has on forest habitats, biodiversity, and forest regeneration in an effort to optimize forest management in relation to costs and long-term benefits.

**ASRIP funding:** \$223,740 (*Research Infrastructure*)

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**Project:** 04-044 – Project to Restore Movement (Richard Stein)

**Description:** Project Restore Movement encompasses a range of brain stimulation equipment that will place the Project at the very forefront of non-invasive study of brain function. The overall goal is to understand the normal control of movements and to use this knowledge to enhance and restore movements to people with motor disabilities resulting from strokes, accidents and other causes

**ASRIP funding:** \$510,600 (*Research Infrastructure*)

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**Project:** 04-051 – Canadian Molecular Cytogenetics Platform: Health Technology Assessment Facility (Darrell Tompkins)

**Description:** The CFI project is a national consortium of researchers and clinicians studying the application of advanced molecular cytogenetic technologies. Cytogenetics is a unique diagnostic tool that can identify abnormalities in an individual's genome that can cause birth defects, developmental delay, mental retardation, growth abnormalities, infertility, recurrent miscarriages and cancer. The University of Alberta will provide a core facility for the assessment of new diagnostic technologies as they are developed.

**ASRIP funding:** \$47,714 (*Research Infrastructure*)

<b>University of Calgary: \$5,561,712</b>
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**Project:** 04-011 – Laser Speckle Blood Flow Imaging: Technology Transfer (Robert Bray)

**Description:** Laser speckle blood flow imaging (LSI) is a new imaging technology that can be used for diagnosis and treatment decisions in a broad array of medical situations including burns, diabetes, delayed wound healing, and orthopedic, bowel and cardiovascular surgery. LSI is accurate, practical and provides faster and better imaging of tissue blood flow than existing technology. The researchers will develop a more user-friendly, robust and portable prototype of this innovative instrument that will have commercial potential in hospital and research environments. The commercialization of LSI has the potential to reach very large clinical and research-related markets in North America and Europe and bring both health and commercial benefits to Alberta.

**ASRIP Funding:** \$129,262 (*Enabling Research Application and Technology*)

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**Project:** 04-013 – Innovative Approaches to Modulating Microbial Biofilms in Alberta’s Oil and Gas Industry (Howard Ceri)

**Description:** As oil reserves dwindle the importance of optimizing secondary oil recovery through new technology such as biocides is becoming more urgent. Microbial biofilms, communities of bacteria that stick to surfaces, represent a significant cost to Alberta's oil and gas industry through corrosion of pipelines and souring and plugging of oil fields, yet have the potential to be used positively to clean oil spills. Biotechnology is currently used in oilfields but is expensive and less effective that it could be due to a lack of scientific knowledge in the application of treatments. The researchers are developing innovative technology to understand and develop new and more effective microbial treatments in the oil industry.

**ASRIP funding:** \$400,000 (*Enabling Research Application and Technology*)

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**Project:** 04-063 – Canadian Pain Trials Network (Paul Taenzer)

**Description:** The Canadian Pain Trials Network will shift from a disease-based approach to a direct, mechanistic approach to pain research. The national program will maximize the impact of the Canadian pain research community by facilitating collaboration and providing access to the national population. The goals are to create new therapies, build a national pain database, develop health policies to reduce the incidence of pain, decrease its socioeconomic impact and maximize opportunities for commercialization. The network will coordinate multi-centre clinical trials for the development of novel therapies, and develop an innovative clinical research training program.

**ASRIP funding:** \$22,507 (*Research Infrastructure*)

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**Project:** 04-067 – Institute for Inflammatory Diseases: A common focus for the improvement of health (Paul Kubes)

**Description:** Inflammatory diseases, including asthma, sepsis, multiple sclerosis and inflammatory bowel disease, affect millions of Canadians and cost billions of dollars annually in direct health care costs and lost productivity. The Institute for Inflammatory Diseases brings together the facilities and researchers to develop new strategies for prevention and treatment of inflammatory disease that will lead to improved quality of life and reduced mortality, while marketing drug discoveries and creating knowledge-based jobs.

**ASRIP funding:** \$2,009,943 (*Research Infrastructure*)

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**Project:** 04-068 – Project neuroARM: MR compatible image guided robot for microsurgery (Garnette Sutherland)

**Description:** Project neuro-ARM is the development of an innovative medical robot system designed to enhance human-guided, robot microsurgery through magnetic resonance image (MRI) guidance, tremor elimination and increased spatial resolution. Integral to the project is the development and testing of ever advancing surgical robots and a simulation laboratory for surgical training and testing new surgical procedures.

**ASRIP funding:** \$3,000,000 (*Research Infrastructure*)

**Project:** 04-069 – Brain, Behaviour and Cognitive Science Imaging Facility (Bryan Kolb)

**Description:** The Brain, Behaviour and Cognitive Imaging Facility will support Canada's leading team of behavioural neuroscientists in the Canadian Centre for Behavioural Neuroscience (CCBN). The University of Lethbridge researchers have been successful in acquiring state-of-the-art instrumentation for imaging, measuring brain activity in humans, and a kinematic system to analyze human movements and movement disorders. The expansion of the CCBN will allow researchers to take full advantage of the equipment and collaborations by bringing together researchers from Psychology, Neuroscience, Biology and Biochemistry to tackle the main research themes at the CCBN: spatial cognition and memory, motor control, neurological disorders (e.g., Parkinson's' disease, fetal alcohol syndrome, and stroke), drug addiction and brain plasticity.

**ASRIP funding:** \$933,082 (*Research Infrastructure*)