Alberta Advanced Education and Technology

Small Equipment Grants Program

Research Impacts

2007 Annual Report

SEPTEMBER, 2008

Small Equipment Grants Program Research Impacts

Targeted Research Areas

The Small Equipment Grants Program (SEGP) builds research capacity by the recruitment of emerging talent and retaining leading researchers in Alberta. The SEGP provides start-up equipment support to existing and first-time Alberta academic appointments whose research is highly aligned with Alberta's strategic priority areas of Information and Communications Technology, Nanotechnology, Energy and Life Sciences Research.

SEGP supports research in the following targeted research areas:

Information and Communication Technology (ICT) Research

ICT is one of the world's strongest, fastest growing economic sectors. The foundation for telecommunications, electronics, computing, medicine, advanced materials and manufacturing industries, ICT is projected to grow at a rate of nine per cent over the next 10 to 15 years, to an estimated worth of $2 trillion. More information can be found at: Information and Communications Technology Strategy

Nanotechnology Research

Nanotechnology research explores the unique properties of biological structures and engineered materials at an atomic and molecular scale to find out how changing their structure, size or chemical composition creates an improved or beneficial application. Through the convergence with ICT, biotechnology and other technologies, it has the potential to create entirely new industries. More information can be found at: Nanotechnology Strategy

Energy Research

To address the technical, economic, and environmental challenges faced by Alberta's energy industry six research goals are being pursued: develop clean burning coal, upgrade oil sands technology, manage carbon dioxide and other emissions, improve oil and gas production, support new technology to reduce fresh water use, and develop an energy research infrastructure to support the emerging fuel cell industry and the hydrogen economy. More information can be found at: Alberta Energy Research Strategy

Life Sciences Research

Life sciences is a significant element of the Alberta economy. It will make an increasing contribution to traditional and new value-added activities in agriculture and agrifood, forestry, environment and health. By 2020, the life sciences industry will generate $55 billion in revenue and 70,000 new high tech and value- added jobs will be created. More information can be found at: Life Sciences Strategy

Other/Platform Technology Research

The Alberta government makes strategic investments outside the four targeted research areas to enhance the province's position in the knowledge-intensive economy, and to make the province increasingly competitive in global markets. These other/platform technologies include climate change, engineering, chemistry and economics research.

Recent Recruitment and Retention

The primary component of quality research is quality people. Building and growing Alberta's research capacity in each of the strategic priority areas requires the recruitment of promising new researchers and the recruitment and retention of 'research stars' with a demonstrated record of excellence. The SEGP is being utilized along with other programs to recruit new research talent to the province, and to retain our best performers. The following are examples of recent SEGP research project awards and biographies of the new researchers brought to Alberta universities.

Remote Monitoring System for Monitoring Numerical and Functional Responses of Wildlife in Dynamic Landscapes

Dr. Erin Baynes moved from an NSERC-supported postdoctoral fellowship position in the Department of Biological Sciences at the University of Alberta to become an Assistant Professor. His work in understanding the effects of forest fragmentation on predator-prey dynamics is highly cited and has been published in the best journals in the fields of ecology (Ecology), ornithology (the Auk), and environmental science (Conservation Biology). As an ecologist, Dr. Baynes has developed computer-based models to understand how forest fragmentation alters predator-prey relationships.

Self-Assembled Nanostructured Organic Materials

Dr. Hicham Fenniri joins the University of Alberta through its association with the National Research Council's National Institute for Nanotechnology. Previously, Dr. Fenniri was an Assistant Professor with Purdue University in Indiana and founded its Laboratory for Chemical Nanotechnology. The cross-discipline aspect of Dr. Fenniri's work is reflected by the sources of funding that he has received in grants from the National Institute of Health (US), the Canadian Space Agency, the Alberta Energy Research Institute, and the Natural Sciences and Engineering Research Council of Canada.

Development of Cardiovascular Magnetic Resonance Imaging

Dr. Richard Thompson is an Assistant Professor in the Department of Biomedical Engineering at the University of Alberta. Previous to this position, he held a postdoctoral fellowship at the National Heart, Lung and Blood Institute in Bethesda, Maryland. Dr. Thompson's research focuses on developing magnetic resonance techniques for cardiovascular imaging, with an emphasis on the quantification of the movement of blood. His research is supported by a grant from the Alberta Heritage Fund for Medical Research and the University of Alberta.

Research Facility for Laboratory Spectroscopy of Terrestrial and Outer Planetary Molecules

Dr. Adriana Predoi-Cross is an Assistant Professor in the Department of Physics at the University of Lethbridge. She works closely with the physicists in the Hyperspectral Imaging Laboratory for Remote Sensing Applications. The laboratory is unique in Canada and represents a state-of-the-art environment for spectroscopic research. Her long-term goal is to develop spectroscopic techniques to increase our understanding of Earth and planetary atmospheres. Another application for her research is in the oil and gas industry, where it could be used to develop better methods of detecting gas pipeline leaks.

Centre for Integrative Chronobiology

Dr. Antle is an Assistant Professor in Behavioural Neuroscience at the University of Calgary. While renovations to his research centre are nearly complete, properly equipping this space will be essential to retain Dr. Antle. The centre is located in 1000 sq. ft. of dedicated space in the Department of Psychology and will be used to study the mammalian circadian system and it's relation to sleep disorders. The ultimate goals of Dr. Antle's experiments will be for the development of interventions that can cause adjustments to the circadian clock and treatments of human sleep disorders and shift-work related maladies.

Canadian Satellite Altimetry Database & Processing System (CADS)

Dr. Alexander Braun holds a PhD in Geophysics from the University of Frankfurt. He is both a geodesist and geoscientist with a strong background in the interdisciplinary field of space geodesy, geodynamics and geophysics. Dr. Braun's current research is focused on the application of space geodetic data in monitoring crustal deformation and sea level change. In particular, he is an expert in satellite altimetry using both laser and radar sensors, and geodynamic modeling. Dr. Braun was a research scientist at the GeoForschungsZentrum Potsdam, Germany, and was a Senior Research Associate at the Laboratory of Space Geodesy and Remote Sensing and the Byrd Polar Research Center at Ohio State University. In October 2004, he joined the Schulich School of Engineering in the Faculty of Engineering at the University of Calgary.

A Cell Biology Lab for the Institute of Biocomplexity and Informatics

Dr. Stuart Kauffman is the Director of the Institute for Biocomplexity and Informatics at the University of Calgary. Dr. Kauffman is well known for his research in theoretical biology and as a pioneer in the field of complexity theory. At the Cell Biology Laboratory, Dr. Kauffman will use powerful computing resources to test some of his theories on the systems that regulate cell growth, division and differentiation. Understanding these systems may lead to the ability to control them, which could mean new cancer treatments using cell-based approaches rather than traditional treatments such as surgery, radiation and chemotherapy.

Fabrication and Testing Facilities for Carbon Nanotube-based Devices and Circuits

Dr. Jie Chen is an Associate Professor in the Department of Electrical and Computer Engineering at the University of Alberta. His training at the University of Maryland at College Park is in nanoelectronics, biomedical devices, circuit designs, signal processing and sensors. As an Assistant Professor at Brown University in Rhode Island, Dr. Chen developed a proof-of-concept ultra-low power microchip that uses significantly less power than the current market technologies. He is working with TEC Edmonton to patent his designs.

Novel Reservoir Simulation Using Parallel and Hardware Acceleration

Dr. Ian Gates is an Associate Professor with the Department of Chemical and Petroleum Engineering at the University of Calgary. The University recruited Dr. Gates from a Research Specialist position with Imperial Oil Ltd where he focused on oil sands development and research. While working in industry, Dr. Gates taught engineering at the University of Calgary, where he won the 2003/2004 Oil and Gas Professor of the Year Award. Dr. Gates specialty is in reservoir engineering and thermal and thermal-solvent recovery processes. He holds an NSERC Discovery grant and is involved in the Alberta Ingenuity Centre for *In Situ* Energy.

Quantum Cryptography and Communication Laboratory (QC2Lab)

Dr. Wolfgang Tittel has joined the Department of Physics and Astronomy at the University of Calgary as an Associate Professor. He leaves his posting as a Scientific Collaborator at the University of Geneva, where he made significant research contributions in the area of quantum cryptography and quantum communication. The result was to bring quantum communication out of the laboratory and into the real world using a standard telecommunication fibre network, thereby raising both scientific and public awareness and appreciation that quantum technology is not restricted to basic research. In 2004, he received the European Union Descartes prize for excellence in collaborative research.

A Glycoengineering Laboratory

Dr. Mario Feldman joined the University of Alberta as an Assistant Professor in the Department of Biological Sciences. He was recruited from the Swiss Federal Institute of Technology in Zurich where he worked as a Postdoctoral fellow. Dr. Feldman's research contributions in the area of glycobiology and glycoengineering include multiple recent publications in highly recognized journals. Applications of Dr. Feldman's research include producing therapeutics for autoimmune diseases and cancer treatments by using bacteria to synthesize the active components. Dr. Feldman is a member of the Alberta Ingenuity Centre for Carbohydrate Science where he will complement and extend the applications of Alberta's internationally recognized team of carbohydrate researchers.

Integrative Genomics in Forest Trees: Scaling from Molecular to Ecophysiological Processes

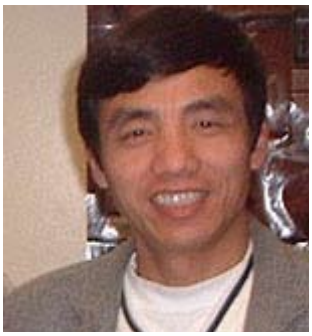
Dr. Janice Cooke is an Assistant Professor in the Department of Biological Sciences at the University of Alberta. She completed her PhD in 1998 at the University of Alberta, took successive postdoctoral positions at the University of Florida and the Canadian Forest Service and has worked directly in the forestry industry. Her experience in the forestry sector positions her to make meaningful research contributions in the area of forest genomics and the health and quality of Alberta's forests.

Thermal-sprayed Nanostructured Coatings for Equipment in the Natural Resource Sector

Dr. Andre McDonald was recruited as an Assistant Professor in the Department of Mechanical Engineering at the University of Alberta from the private sector where he was a professional engineer in wastewater, heating, ventilation, and air conditioning. At the University of Alberta, he is investigating the feasibility of using nanostructured coatings to prevent corrosion and general wear on industrial equipment. Dr. McDonald's research has potential applications and economic benefits to key industry sectors in Alberta, including energy and forestry.

Optical Instrumentation for the Investigation of Industrial Flows Related to Oil Sand and Energy Production

Dr. David Nobes was recruited to the Department of Mechanical Engineering at the University of Alberta after completing his PhD at the University of Adelaide and training as a postdoctoral fellow at Cranfield University in the United Kingdom. He also brings experience as an Engineering Research Scientist with the Canada Research and Development Corporation. Dr. Nobes will investigate the fluid mechanics of turbulence with an aim to optimize fluid flow in industrial processes. This research has direct relevance to Alberta's energy industry.



Scientific Computing Infrastructure for CO_2 Injection Enhanced Oil Recovery

Dr. John Chen was recently recruited to the Schulich School of Engineering at the University of Calgary. He brings academic and private sector experience to Alberta from previous positions with Southern Methodist University in Dallas, and Mobil Technology Company. Dr. Chen models various types of flows in petroleum reservoirs based on his knowledge of mathematics and computer science. He has developed software that is currently being used to model flows in select oil reservoirs around the world.

In Vivo Imaging Laboratory

Dr. Catherine Chan was recently recruited as a cross-appointed Professor to the Departments of Physiology and Agricultural, Food and Nutritional Science at the University of Alberta. As a Professor at the University of Prince Edward Island, she implemented a research program for studying insulin producing cells in the pancreas. She plans to extend her work by using specialized imaging equipment which allows for noninvasive monitoring of an animal's metabolic changes throughout the course of a disease. The new technology reduces the number of animals required in a study, and allows for direct correlation between what is happening in a living system *(in vivo)*, and previous laboratory discoveries.

Functional and Neurochemical Correlates of the Pathology of Parkinson's Disease

Dr. Gerlinde Metz was recruited to the Canadian Centre for Behavioral Neuroscence in 2000 from Zurich, Switzerland, where she completed a doctorate at the Swiss Federal Institute of Technology. She investigates the mechanisms of functional recovery and compensation in models for human neurological disorders, including Parkinson's disease, stroke, and spinal cord injury. One of the current approaches focuses on elaborating the role of physiological and environmental aspects in the pathology of Parkinson's disease, a disorder of the central nervous system mainly affecting motor function.

Scanning Microscopy and Vibrational Spectroscopy for Molecular Device Research

Dr. Bob Wolkow has accepted a position of Professor of Physics and iCORE Chair in the Department of Physics at the University of Alberta. In order to take up this position, he left his long-time position at the Steacie Institute for Molecular Sciences in Ottawa, where he was Principal Research Officer and leader of the molecular interfaces program. Dr. Wolkow also holds the position of Principal Research Officer and leader of the Molecular Scale Devices research group at the National Institute for Nanotechnology. Dr. Wolkow's primary research interest is in composite materials and molecular devices.

Nanoscale Functionalization of Semiconductor Surfaces

Dr. Jillian Buriak was born in Toronto, received her education at Harvard and obtained her PhD at Université Louis Pasteur in Strasbourg, France. She went on to accept positions at Purdue University in Indiana and the Scripps Research Institute in California. Dr. Buriak returned to Canada in 2003 to head the Materials and Interfacial Chemistry Group at the National Institute for Nanotechnology and to teach Chemistry at the University of Alberta. She is a leading expert in semiconductor surface chemistry, and is developing new methods to integrate catalysts, molecular electronics and sensing elements with technologically important semiconducting and conducting materials.

Impacts of Completed SEGP Projects

By attracting and retaining highly qualified people with equipment and facilities, the SEGP is creating a climate that builds synergy and collaborations among our leading researchers and provides state-of-the-art training opportunities for graduate students - the next generation of high quality innovators. The following are some notable examples:

Infrastructure for Flow-Surface Interaction Laboratory

Dr. Brian Fleck

Dr. Brian Fleck received SEGP funds for equipment to pursue research interests in the field of fluid dynamics, mixing and turbulence, multiphase flow and atomization and renewable energy.

Surface engineering, which is the ability to control solid surface properties such as wetting, surface charge, bio-compatibility, and micro/nano topography, is of significant technological importance because of the demand for advanced materials and the trend to miniaturization of systems. As the volume to surface ratio for a system decreases, surface forces are gaining prominence in determining system behavior. Various projects on phenomena affected by surface properties (e.g. surface tension) and fluid mechanics and related instrumentation is the focus of the University of Alberta's Surface Engineering Group.

The equipment has been used extensively in collaboration with Syncrude Canada and Shell International. The infrastructure obtained through the grant has led to improving the atomization performance of nozzles in two phase flow for oil sands cokers. Tests are being done to try to understand how an effervescent nozzle works in terms of its spray characteristics. The research has led to improved efficiency of the Syncrude Canada coker facility and a reduction in greenhouse gas emissions per tonne of heavy oil upgraded.

As a result of the infrastructure, continued financial support from partners in the energy field have led to improvements in Alberta's energy sector. The infrastructure also has a positive effect on training. All the highly qualified personnel who work with the infrastructure are gaining valuable experience using it.

Dr. Scott Chang

Novel Approaches to Better Understanding Forest Soil Processes and their Implications for Forest Productivity and Global Change

Dr. Scott Chang's research focuses on the environmental sciences. The infrastructure acquired from the SEGP is used to investigate important environmental issues that Albertans are facing, such as the impact of acid deposition on the environment, the revision of the Land Capability Classification System, and the calculation of carbon balance in specific environments. It is difficult to put a dollar value on the research, but the information may have significant economic and social benefits in improvements in health, environment, and quality of life.

Currently, research in Dr. Chang's group is being supported by federal government funding agencies, federal government departments (such as the Canadian Forest Service), provincial government sources, and industry (forestry, and oil and gas). The availability of the infrastructure is playing a significant role in the research collaboration across disciplines and institutions. For example, a research collaboration was established with range management ecologists and soil ecologists. Research partnerships also exist with Alberta Pacific Forest Industries Inc., the Cumulative Environmental Management Association, and Alberta Environment. The availability of the infrastructure provides an excellent opportunity for training graduate students, postdoctoral fellows, and visiting scientists. In the five years since the infrastructure was acquired, Dr. Chang's group has trained five visiting scientists, four postdoctoral fellows, five graduate students, ten summer research assistants, and a number of others from outside the group that came to use the facility.

In-Vivo High Resolution Computed Tomography Centre for Bone and Joint Injury Research

Dr. Steven Boyd and the HR-pQCT Scanner

The project established the first high resolution peripheral computed tomography scanner (HR-pQCT) for measuring human bone architecture to assess bone "quality" – that is, the health of bones and consequent risk of fracture. This machine and the associated analysis systems (computers) constitute a major advance for the detection of bone diseases such as osteoporosis, and for monitoring bone changes in people who require disease treatment.

The advantage of this system over current technologies is that rather than a two-dimensional image of patients' bones, it provides high resolution three-dimensional data. Thus, important distinctions can be made between patients with disease or who are undergoing treatment. For example, for the first time, it is possible to determine whether the cortical bone (compact outer bone) or the cancellous bone (inner spongy bone) are being influenced by disease or treatment. The technology has not only attracted the interest of health care providers, but also pharmaceutical companies (e.g. Amgen for clinical trials of new treatments for osteoporosis) who are able to determine the efficiency of their treatments better than previously possible.

The equipment has led to unique collaborations at the University of Calgary. Biomedical Engineering is one of the fastest growing fields of engineering, at the University of Calgary. "I am an engineer, so utilizing the equipment requires close collaboration with health care clinicians and other researchers to plan the experiments conducted with the scanner" says Dr. Boyd. Furthermore, new collaborations with other health care providers have developed, including physicians at the new Alberta Children's Hospital, to look at young individuals with rare diseases that influence their bone quality. In addition to the basic clinical research being performed on the equipment, researchers have also attracted the interest of industry to participate in international clinical trials. A major reason the clinical trials were performed in Calgary was due to this novel infrastructure.

Dr. Steven Boyd and his team are now in a position to establish new and sensitive methods to assess patient bone quality by three-dimensional bone scanning, and to be positioned as world leaders in this field. The equipment has attracted industrial interest, federal and provincial research funding, and most importantly, top rated graduate students and research assistants to train and work in the lab. The impact of this equipment on the researchers has been extremely positive, and the potential for improving the health of Albertans and Canadians is outstanding. Never before have researchers been capable of understanding bone structure in diseases and treatment at this level of detail, and to assess directly the risk of fracture, and potential benefits of pharmaceutical intervention.

In-Vivo Imaging System for Assessing Intestinal Microvasculature During Inflammation

Dr. Donna-Marie McCafferty

Dr. Donna-Marie McCafferty's research program contributes to the area of gastrointestinal inflammation, with specific interest to researchers of both basic and clinical science background in Inflammatory Bowel Disease (IBD). The highest incidence rates for IBD are found in developed countries of the northern hemisphere: Canada, USA, UK, and Scandinavia. For the patient, the consequences of IBD include rectal bleeding, diarrhea, weight loss and a reduced quality of life, and may even result in death. The SEGP infrastructure award equipped Dr. McCafferty's laboratory with both standard laboratory equipment and novel infrastructure, establishing her as an independent researcher. "Mine was one of the smaller grants awarded by the SEGP, but the impact of the new equipment on my research work has been great" says Dr. McCafferty. The gastrointestinal intravital microscopy system allows researchers to investigate the role of bacterial products and their receptors on the development of intestinal inflammation. Researchers can examine various indices of inflammation and assess the relative importance of different proteins in the development of intestinal dysfunction using genetic mutant mice. The infrastructure is being used to identify the mechanisms involved in inflammation and with this, researchers can start to identify key targets for therapeutic intervention.

The imaging system provides new techniques for the Gastrointestinal Research Group (GIRG) and has generated study in collaborative projects such as liver dysfunction and arthritis. As reported by Dr. McCafferty, an unexpected benefit of the research has been understanding the role that intestinal inflammation plays in the onset of cancer. She has recently broadened her research scope to study colon cancer development with the aid of a Canadian Institutes of Health Research grant.

The SEGP leverages federal and private sector funds to maximize research dollars flowing into Alberta.

The Small Equipment Grants Program (SEGP) serves as an important mechanism for leveraging funds from the federal Canada Foundation for Innovation (CFI), the private sector, and other sources in order to maximize the research dollars flowing into Alberta. Researchers from Alberta universities may apply to both the CFI's Leaders Opportunity Fund and to SEGP for their project's funding. Applicants may ask for up to 40% of the total project costs from the federal government and also up to 40% funding from the Alberta government. The remaining funding is obtained from the private sector, other research institutions or from universities.

The program has three annual submission dates, March, July and November to coordinate with the CFI's three annual submission dates (with SEGP decisions preceding the CFI dates by one month per cycle). The SEGP also coordinates with Alberta's research institutes and foundations to ensure that capacity is built within Alberta's strategic research areas and that small and large equipment investments complement other targeted provincial funding.

The SEGP and earlier programs funded 128 infrastructure projects between 2000 and 2007. During this period, the SEGP strategically invested nearly $21 million to enable the significant increase of research capacity in Alberta. The total value of these projects was over $70.2 million, with the remainder of the funding derived from the federal government, the private sector, and non-profit sources.

The SEGP has invested primarily in three targeted research areas: Information and Communications Technology ($2.2 million or 11%), Energy ($2.1 million or 10%), and Life Sciences ($11.2 million or 54%), while supporting multi-disciplinary projects that cross these areas of priority ($5.3 million or 25%). Multi-disciplinary projects have impacted climate change/environment, nanotechnology, engineering and social sciences. (Figure 1)

In addition, SEGP funding leveraged approximately 70% of the total project cost of $70.2 million. (Figure 2)

SEGP's total investment of $21 million went to the University of Alberta (57%), followed by the University of Calgary (38%), the University of Lethbridge (4%), and other institutions (1%). (Figure 3).

Further details on SEGP projects can be found in the Project List 2000-2007.

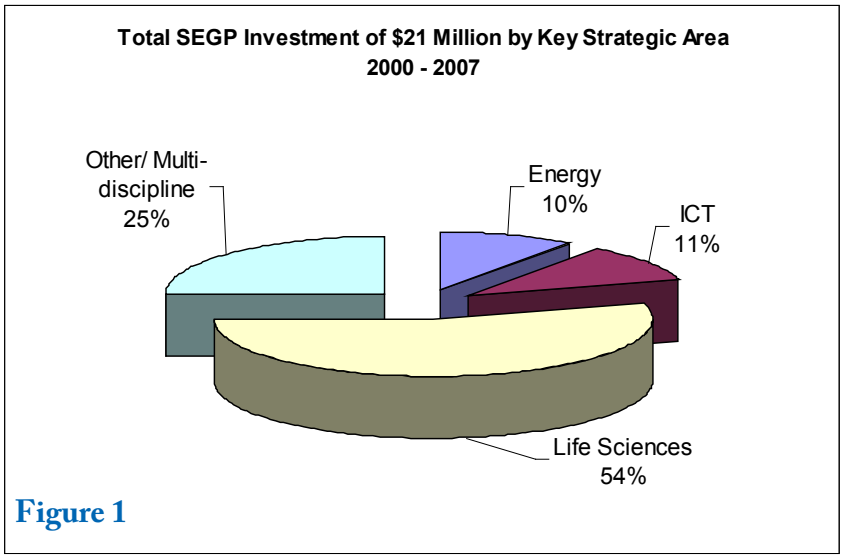


Figure 1

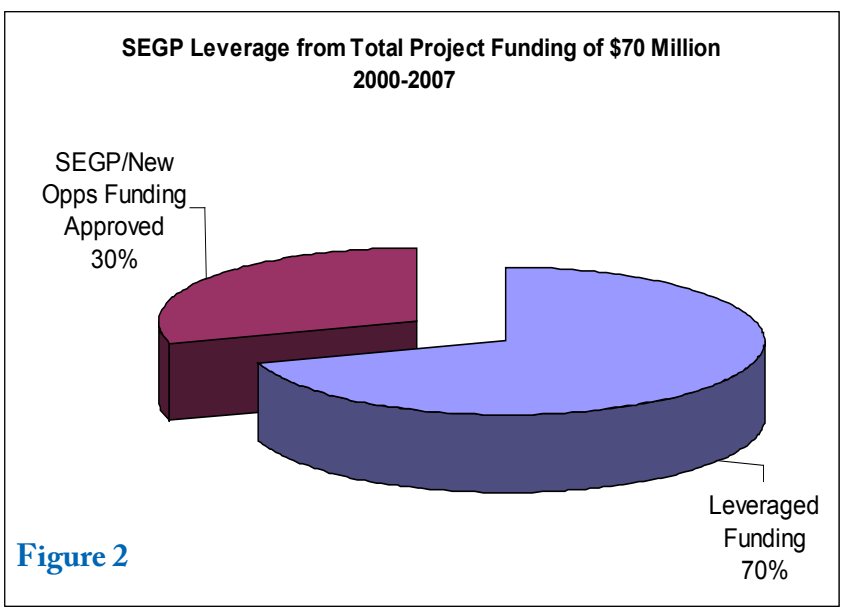


Figure 2

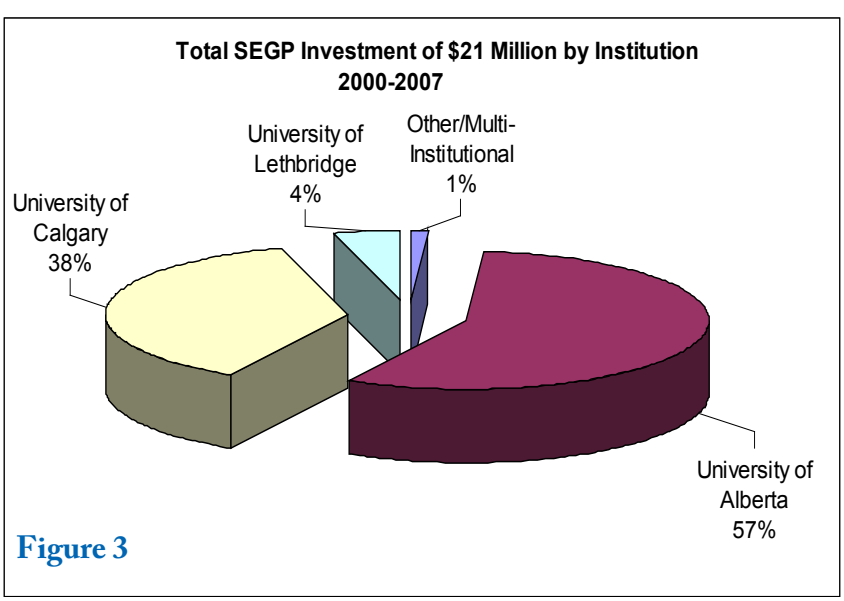


Figure 3

Small Equipment Grants Program/New Opportunities Program
Project List 2000-2007

Project Number	Project Title	Descriptive Summary	Primary Investigator	Lead Organization	Total Project Cost	SEGP Funds Approved	Key Strategic Area
01-038-RI	Magnetic Resonance Imaging for the Assessment of Stroke and Other Neurological Disease	MRI techniques will play a critical role in understanding the evolution and treatment of strokes in humans. The goal of our proposal is to acquire the infrastructure needed to facilitate the development of a state-of-the-art MRI stroke research program a the U of A.	 Christian Beaulieu	University of Alberta	$728,438	$355,000	Life Sciences
01-039-RI	Electrospray ionization - high field asymmetric waveform ion mobility spectrometry - tandem mass spectrometry (ESI-FAIMS-MS/MS)	ESI-FAIMS-MS/MS is a promising new technique for identification and characterization of polar compounds in complex matrices. The infrastructure will be used for human exposure research on disinfection by-products and metabolites, cyanobacterial toxins, gas/oil well flare emissions, and arsenosugars and metabolites in seafoods	 Kenneth Froese	University of Alberta	$497,083	$197,614	Life Sciences/ Energy
01-053-RI	Cardiovascular Ion Channel Gene Therapy Unit (CIGNET)	CIGNET is a core molecular physiology facility dedicated to the study of the role of cardiovascular potassium channels in health and disease. Research will range from molecular biology to whole animal and human physiology. CIGNET will support translational research on common diseases (eg. Sudden Infant Death Syndrome and hypertension).	 Evangelos Michelakis	University of Alberta	$806,498	$320,000	Life Sciences
01-056-RI	Biotelemetry analysis system: infrastructure for cumulative effects assessment	The infrastructure combines new space-based technology with sophisticated statistical computing and modeling to develop a powerful new tool for evaluating the cumulative effects of land-use development on wildlife populations. This new tool can be applied to a host of species and adapted to landscapes worldwide.	 Mark Boyce	University of Alberta	$860,815	$200,000	Life Sciences

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01-060-RI	Infrastructure for deposition and characterization of combinatorial arrays of thin-film inorganic compounds and opto-electronic devices	Construction of a deposition system to define and control the composition and architecture of combinatorial arrays of inorganic thin films and thin film heterojunctions for photovoltaic applications. Optical and electron beam induced current (OBIC & EBIC) instruments will be constructed to provide a rapid screening technique.	 Joel Haber	University of Alberta	$1,288,622	$540,000	Energy/ ICT
01-103-RI	Creation of a Multidisciplinary 3 Dimensional Morphometrics Centre	Infrastructure to create a multidisciplinary laboratory for 3 dimensional morphometics. Components include a Micro CT,Reflex microscope and facilities for image analysis. Facilities will be used by researchers across faculties at UofC & UofA.	 Benedikt Hallgrimsson	University of Calgary	$802,952	$235,624	Life Sciences
01-112-RI	Advanced Space Instrument Facility (ASIF)	The facility consists of a combination of expertise and specialized equipment for the design, evaluation and operation of micro-satellites and satellites. The infrastructure was used to upgrade an existing U of C lab into a world-class space science facility. ASIF's design capability includes electro-optical detectors, optical instrumentation, and space plasma instruments.	 Andrew Yau	University of Calgary	$605,505	$299,000	Other/ Multi-discipline
01-159-RI	Molecular Biology Infrastructure and Cell/Tissue Culture Facilities for Novel Biochemical Engineering Research	Will build on a proven track record in the biotechnology field and pursue innovative projects in upstream, process and downstream biochemistry engineering and will serve as a versatile and powerful analytical facility for other researchers.	 Michael Kallos	University of Calgary	$522,427	$255,700	Life Sciences
02-081-RI	Plant Biotechnology Infrastructure: Applications of Molecular Biology and Gene Expression Assays	Develop a plant molecular biology laboratory. Key pieces of equipment include plant growth chambers, specialized camera systems, microscopes and specialized equipment to support molecular research approaches.	 Olga Kovalchuk	University of Lethbridge	$433,234	$171,825	Life Sciences

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02-110-RI	2-Photon/Confocal Microscopy in Voltage-Clamped Respiratory Neurons	Infrastructure to understand perinatal respiratory network functions, sudden infant death syndrome and other life-threatening diseases associated with disturbed neuronal respiratory functions.	 Klaus Ballanyi	University of Alberta	$1,387,403	$518,620	Life Sciences
02-111-RI	Centre for Symbolic Computation	Development of software for symbolic computation for use in applied mathematics and in high energy and condensed matter physics, computational fluid dynamics, and electrical and chemical engineering.	 Andrzej Czarnecki	University of Alberta	$364,574	$133,835	ICT
02-112-RI	Development of a Core Facility for Spatial Applications of Social Ecology	Development of integrative models that involve both socio-economic and environmental variables for improved environmental and natural resource management planning.	 Debra Davidson	University of Alberta	$505,400	$173,240	Life Sciences
02-113-RI	Laboratory for perceptual motor behaviour in Down syndrome and other special populations	A laboratory that is committed to the study of perception and human movement within special populations and across various levels of analysis.	 Brian Maraj	University of Alberta	$359,086	$100,000	Life Sciences
02-114-RI	Electromagnetic Instrumentation for Studies of the Continents	Infrastructure for subsurface imaging techniques with natural electromagnetic signals for use in earthquake hazard research, tectonics studies, mineral exploration and environmental studies.	 Martyn Unsworth	University of Alberta	$297,302	$118,423	Life Sciences/ Energy
02-115-RI	Establishment of a high-performance real-time digital signal, image and video processing laboratory	Creation of a low cost automated intelligent sensors network with research and development in real time digital signal processing, multimedia information appliance network, and systems identification and advanced control systems.	 Wael Badawy	University of Calgary	$347,938	$131,870	ICT

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02-116-RI	Thermal Science Facilities	Experimental and computational facilities to perform research in the energy environment.	 Abdulmajeed Mohamad	University of Calgary	$366,379	$144,340	Energy
02-117-RI	High-Field Magnetic Resonance Imaging for Vascular Diagnosis and Intervention	Clinical medical imaging research in the areas of whole body imaging and vascular imaging.	 Richard Frayne	University of Calgary	$723,308	$220,000	Life Sciences
02-119-RI	Foothills Climate Array; Spatial Array of Meteorological Instruments to Study Mesoscale Climatological Processes, Precipitation and Temperature Variability, and Regional Climate Change	Study of regional weather variability and the underlying climatic processes to improve process parameterizations in models and provide insight 'downscaling' of climate model predictions to the scales of impact for human development and the environment.	 Shawn Marshall	University of Calgary	$632,960	$234,002	Life Sciences/ Energy
02-120-RI	The Experimental Economics Laboratory at the University of Calgary	A facility for innovative research on decision-making and market institutions with direct relevance to economic and social policy.	 Robert Oxoby	University of Calgary	$418,962	$160,490	Other/ Multi-discipline
03-010-SRI	Equipment for Field Studies of Competition Ecology and Stand Dynamics in Western Boreal Forests	Development of the Mixedwood Growth and yield Models (MGM) and evaluation of the growth and yield implications of different silvicultural and management systems for Alberta's forests.	 Philip Comeau	University of Alberta	$334,476	$100,343	Life Sciences

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03-011-SRI	Chemical and Biological Nanotechnology	Developing nanotechnological techniques which will use pathogens such as viruses to map the surface of human cells with nanometer resolution and, in turn, aid in the development of new drug therapies to combat infections.	 John-Bruce Green	University of Alberta	$1,159,096	$345,314	Life Sciences
03-012-SRI	Infrastructure for Flow-Surface Interaction Laboratory	Infrastructure to support research in fluid mechanics, turbulence, and combustion with research projects related to oil and gas production and refining, industrial and residential furnaces, as well as IC engines and gas turbines.	 Brian Fleck	University of Alberta	$558,472	$166,861	Energy
03-014-SRI	Protein production and crystallization facility for structural biology research	Protein crystallography poses challenges because proteins are unstable, soft molecules and require perfect conditions to crystallize. Hundreds of crystals are created with the help of a robot in the hope of finding perfect crystals that will reveal protein structures.	 Bart Hazes	University of Alberta	$684,988	$213,563	Life Sciences
03-015-SRI	Infrastructure for Establishing an Information Research Laboratory	Dr. Li's research interests are statistical genetics and genomics. In particular he is developing statistical methods to find genes responsible for complex human diseases, using either family or population based approaches. The laboratory is also used for statistical computing and modeling of reaction diffusion systems that arise in biological models.	 Michael Li	University of Alberta	$350,000	$105,000	Life Sciences
03-016-SRI	Manufacturing, Modeling and Control of Solid Oxide Fuel Cells	This research will concentrate on fundamental dynamic modeling with the objective of determining optimal designs and operating profiles. As electric vehicle power sources, the dynamic behavior of the batteries or fuel cells sets the limits on achievable performance.	 Jingli Luo	University of Alberta	$706,542	$211,963	Energy

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03-017-SRI	Microinterfacial and Micromechanical Facilities	The infrastructure will support colloidal and interfacial science in general, and small scale interfacial phenomena or microinterfacial phenomena in particular. Here, "small scale" implies dimensions on the order of one to ten micrometers. Many important systems in industrial and biological applications appear in the form of liquid-liquid dispersions, i.e., the dispersion of micrometer-sized liquid drops in a distinct (often immiscible) liquid.	 Anthony Yeung	University of Alberta	$318,906	$95,407	Life Sciences/ Energy
03-018-SRI	Laboratory for visualization, monitoring and human interaction with intelligent machines and robots	Infrastructure to support work related to the areas of machine and biological vision, pattern recognition, robotics, and artificial intelligence. A human can easily pick up a visible object, and can even watch a whole task, learn, and transform the visual information into the necessary motor (muscle) movements to carry out the task.	 Martin Jagersand	University of Alberta	$750,000	$210,000	ICT
03-019-SRI	Single cylinder engine testbed facility for innovative internal combustion engine research	Infrastructure to study the behaviour of internal combustion engines and fluid systems and the application of control to these systems. Homogeneous Charge Compression Ignition (HCCI) is a promising new combustion concept for internal combustion engines in which a homogeneous air-fuel mixture auto-ignites without a spark.	 Charles Koch	University of Alberta	$602,686	$180,806	Energy
03-020-SRI	Laboratory facility for biogeochemical studies of soil organic matter	Infrastructure to investigate the main components of the soil biota; the metabolic and molecular diversity of microbial populations and their role in soil processes; the microbiology and biochemistry of decomposition of organic matter in soil; kinetics of organic matter turnover; biogeochemical cycling of N, P, S, Si, base cations and metals; and the application of soil microbiology to selected environmental problems.	 Sylvie Quideau	University of Alberta	$488,045	$146,414	Life Sciences

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03-021-SRI	Laboratory for the Design, Modeling, and Nonlinear Control of a Self-Bearing Motor	Infrastructure to investigate the modeling and control of a related system called the self-bearing motor (SBM) (sometimes also called a bearingless motor or integrated motor-bearing). The SBM is an emerging technology which has evolved from traditional active magnetic bearings (AMB) and electric motors.	 Alan Lynch	University of Alberta	$552,698	$165,809	Energy
03-022-SRI	Infrastructure for Fundamental Heterogeneous Catalyst Research	The surface chemistry of a catalyst is studied to predict the activity and selectivity for a variety of applications in the chemical process industry. This infrastructure will be used to investigate the surface chemistry of model heterogeneous catalysts for the petroleum and energy sectors, including bitumen upgrading and hydro treating, and direct oxidation solid-oxide fuel cell development.	 Alan Nelson	University of Alberta	$485,311	$145,560	Energy
03-023-SRI	Novel approaches to better understanding forest soil processes and their implications for forest productivity and global change	Infrastructure to investigate forest soil processes, soil microbial ecology, forest fertilization, tree nutrition, and silviculture-soil management interactions.	 Scott Chang	University of Alberta	$521,349	$155,658	Life Sciences
03-024-SRI	Molecular physiological analysis of voltage-clamped respiratory neurons	Infrastructure to understand basic mechanisms of neuronal information processing within respiratory networks. The lab is trying to understand how neurons and networks of neurons in the brainstem and spinal cord produce a breathing rhythm that is not only reliable and robust, but is also very dynamic.	 Gregory Funk	University of Alberta	$1,075,242	$280,792	Life Sciences
03-025-SRI	Development of a Wireless Network Testbed	Infrastructure to enhance user experience of wireless services and applications through research and development of innovative wireless networking protocols. Wireless provides flexibility and enables anytime, anywhere communications. Applications of wireless communications range from high power mobile cellular systems to low power personal area networks (e.g., Bluetooth-based networks).	 Abraham Fapojuwo	University of Calgary	$567,357	$150,000	ICT

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03-026-SRI	Laboratory of Human Cerebrovascular Physiology	Infrastructure to better understand the physiological mechanisms that underlie the regulation of cerebral blood flow (CBF) by oxygen and carbon dioxide in young healthy humans, and to investigate the age-related alterations in this regulation.	 Marc Poulin	University of Calgary	$913,855	$219,002	Life Sciences
03-027-SRI	Development of Microarray Systems Using an Archaebacterial Model	Development of a software package called Osprey for the calculation of optimal oligonucleotides for DNA sequencing and the creation of microarrays based on either PCR-products or directly spotted oligomers. It incorporates a novel use of position-specific scoring matrices, for the sensitive and specific identification of secondary binding sites anywhere in the target sequence.	 Christoph Sensen	University of Calgary	$270,158	$80,083	Life Sciences
03-028-SRI	Instrumentation for Ultra Precision Dynamic Identification, Optimization and Prototyping of Microsystems Technology and Nanotechnology Based Devices	Work in the area of noninvasive precision metrology, providing a foundation for the development of advanced sensing and estimation techniques applicable in ultraprecision machine tools, microelectromechanical systems (MEMS), microtechnology based energy and chemical systems (MECS), and nanoscale devices.	 Slawomir Spiewak	University of Calgary	$354,212	$105,480	ICT
03-029-SRI	A Microscopy System to Measure Vascular Communication	Infrastructure to study the nature of electrical and diffusional communication between smooth muscle and/or endothelial cells. Cell-to-cell communication is central to blood flow control and this process is enabled by intercellular ion channels called gap junctions. Work with cell-to-cell communication involves a combination of experimental techniques and mathematical modeling.	 Donald Welsh	University of Calgary	$446,962	$133,231	Life Sciences
03-030-SRI	*In-vivo* high resolution computed tomography centre for bone and joint injury research	Develop quantitative noninvasive methodologies to understand the etiology of musculoskeletal diseases and injuries, and to use that information for the development of improved treatment strategies. An important tool for much of their research, high resolution computed tomography (micro-CT) is a non-destructive method to image complex 3D structures.	 Steven Boyd	University of Calgary	$625,196	$164,055	Life Sciences

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03-033-SRI	Creation of Biometric Technologies Laboratory	The laboratory emphasizes on modeling and generation of synthetic biometric information, and on testing the biometric devices and systems. The lab focuses on synthesizing biometric data – for example, modeling fingerprint and signature forgeries as well as aging or surgically changed faces - which are then used for testing biometric systems.	 Svetlana Yanushkevich	University of Calgary	$488,374	$139,295	Life Sciences/ ICT
03-035-SRI	Research infrastructure for asymmetric catalysis and supramolecular chemistry	The infrastructure will support developing catalysts to assist in the design of pharmaceutical products; understanding basic metabolism processes in plants, so we can learn more about how plants respond to stresses like drought and climate change; eliminating impurities that have environmental impact from industrial processes in the pulp and paper and fertilizer industries; and characterizing medicinal plants in East Africa.	 Grace Greidanus-Strom	King's University College	$123,479	$36,530	Life Sciences
05-010-SRI	ODEPR System for Novel Studies of Semiconducting Materials	The Optical Detection of Electron Paramagnetic Resonance (ODEPR) equipment is located in the Magneto-Optical Spectroscopy laboratory in the U of A Physics Department. One of the primary research interests of the group is the study of the fascinating physics of bulk and nano-scale semiconductor structures and devices.	 Kim Chow	University of Alberta	$542,187	$102,534	ICT
05-011-SRI	Nano-Designed Materials through Structural Chemistry	The research program is focused upon synthesis, characterization and application of small molecule precursors suitable for fabrication of monodispersed nanoparticles via solution borne chemistry. The resulting materials are suitable for a wide scope of applications including: DNA testing, organic light-emitting diodes (OLEDs), lasers, catalysis, nanoelectronics, and optoelectronics.	 Jonathan Veinot	University of Alberta	$362,046	$91,218	Life Sciences/ Energy/ ICT

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05-012-SRI	Development of a Real-Time Digital Simulation and Control Laboratory for Innovative Research in Power Engineering	New technologies based on sophisticated power electronic apparatus and their digital control systems are finding increasing applications in electric power systems at generation, transmission, distribution, and utilization levels. It is essential to carry out rigorous performance evaluation of the power electronic equipment and their digital controllers prior to their commissioning on the host power system.	 Venkata Dinavahi	University of Alberta	$500,857	$148,709	Energy/ ICT
05-013-SRI	Proteomic analysis of the cardiovascular system in hypertension	Infrastructure to develop a systems biological approach to the study of hypertension. The systems biological approach employs proteomics and computation as well as integrative physiology and pharmacology. The lab is testing the hypothesis that hypertension could result from the perturbation of just a few, yet fundamental, mechanisms of vasoregulation.	 Carlos Fernandez-Patron	University of Alberta	$441,431	$132,429	Life Sciences
05-014-SRI	Nanoscale Functionalization of Semiconductor Surfaces	Infrastructure for unique, unpredictable and highly intriguing physical, optical and electrical phenomena which result from the confinement of matter into nanoscale features. Much of the driving force for building tiny devices and features on the nanoscale is their importance for existing and emerging technologies such as microelectronics, nano-electromechanical systems (NEMS), sensors and diagnostics which communicate directly with cells, viruses and bacteria, quantum confinement effects, and a host of other applications.	 Jillian Buriak	University of Alberta	$707,130	$238,320	Life Sciences/ Energy/ ICT
05-015-SRI	Proteomics Tools for Plant Research	Microarrays are a new technology for measuring the levels of activity for thousands of genes at once. The group is also studying the process of tracheary element (wood) differentiation, and the structure and function of introns. This involves techniques of genetics, bioinformatics, and molecular biology, including high-throughput technologies such as DNA microarrays.	 Michael Deyholos	University of Alberta	$760,878	$228,263	Life Sciences

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05-016-SRI	Infrastructure for Establishing a Communications Research Laboratory (CRL)	Infrastructure supports the fundamental theoretical research on space-time coded multicarrier modulation and ultra-wideband impulse radio, as well as the practical simulation, experiment and implementation of these cutting-edge technologies. The research will address critical physical layer issues in the development of future generation high data rate mobile communications and high speed wireless personal area networks.	 Chintha Tellambura	University of Alberta	$372,908	$135,143	ICT
05-017-SRI	Reconfigurable Testbed for High Performance Parallel Data Mining	Infrastructure to support research interests in computational intelligence (especially fuzzy logic and granular computing), data mining, and their application to software testing and epidemiology.	 Scott Dick	University of Alberta	$744,133	$250,000	ICT
05-018-SRI	*In vivo* imaging system for assessing intestinal microvasculature during inflammation	The infiltration of white blood cells into tissue is a key factor in the development of gastrointestinal inflammation. Dr. McCafferty's laboratory investigates the role of white blood cells in causing macroscopic/histological and epithelial permeability changes in various inflammatory models eg. in response to bacterial products (LPS) and in experimental models of colitis.	 Donna-Marie McCafferty	University of Calgary	$258,693	$69,134	Life Sciences
05-019-SRI	Laboratory for Environmental Catalytic Applications	Dr. Josephine Hill (Faculty of Engineering) is researching catalyst applications for fuel cells and heavy oil processing. Currently most fuel cells operate with hydrogen as the fuel. Hill's research team is developing fuel cells that can use hydrocarbons, such as methane from natural gas, or alcohols, derived from biomass, directly as fuels in order to reduce emissions.	 Josephine Hill	University of Calgary	$521,905	$141,000	Energy

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05-020-SRI	Tools for applied electromagnetics research	Infrastructure to support research in the area of computational electromagnetics, and their application to problems in the realms of electrical engineering, optical engineering, and bioelectromagnetics. The electrical and computer engineering professors are studying the interaction of electromagnetic fields and living biological systems. Specifically, the researchers are exploring a new approach for breast cancer detection called tissue sensing adaptive radar (TSAR).	 Elise Fear	University of Calgary	$647,214	$265,127	Life Sciences/ ICT
05-021-SRI	Establishment of Environmental / Bio-XAS Centre	Infrastructure to support speciation and structural determination of metal complexes using synchrotron based X-ray Absorption Spectroscopy (XAS). This synchrotron-based method can be used to identify the structures and properties of molecules, including those within potentially toxic and environmentally harmful heavy metals such as lead and mercury.	 Farideh Jalilehvand	University of Calgary	$628,085	$183,809	Life Sciences/ ICT
05-022-SRI	Applications of Main Group Inorganic Frameworks in Catalysis and the Material Sciences: State-of-the-Art Synthetic Laboratory	Infrastructure to support research in synthetic inorganic chemistry, with emphasis on the chemistry of the main group elements other than carbon, as well as combinations of these elements with transition metals. The goals are both the development of new molecular materials and the characterization of novel bonding patterns for the main group elements.	 Roland Roesler	University of Calgary	$314,462	$85,339	Other/ Multi-discipline
05-024-SRI	Functional and Neurochemical Correlates of the Pathology of Parkinson's Disease	Infrastructure to investigate physiological and environmental aspects in the pathology of Parkinson's disease, a disorder of the central nervous system mainly affecting motor function. The factors and mechanisms that lead to onset and progression of the motor symptoms of Parkinson's disease are still not clearly understood. Dr. Metz's research investigates some of these factors by using detailed behavioural analysis in rodent models, and evaluating the benefit of potential therapeutic interventions.	 Gerlinde Metz	University of Lethbridge	$314,328	$47,450	Life Sciences

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05-025-SRI	Accessibility to Education Using Learning Objects: Implementing the semantic web with advanced development & testing of applications	Infrastructure to advance the development of innovative e-learning technologies, specifically to create a testbed of linked and interoperable learning object repositories. A repository addresses the problem of finding high-quality and appropriate learning materials using standard web searches by providing educators and learners with information that is structured and organized to facilitate searching, storing, and using learning materials regardless of their source location.	 Rory McGreal	Athabasca University	$592,794	$215,175	ICT
05-026-SRI	Molecular insights into the regulation and recovery of cytosolic calcium during cardiac muscle relaxation.	Infrastructure to support research in membrane proteins involved in calcium ion metabolism in the myocardium. Dr. Young uses electron cryomicroscopy to determine the structure of cardiac membrane calcium transport proteins, such as the sarcoplasmic reticulum Ca2+-ATPase and phospholamban.	 Howard S. Young	University of Alberta	$499,032	$130,007	Life Sciences
05-027-SRI	Neurophysiology laboratory to study and restore human limb movement	The laboratory will focus on research divided into two main categories: how sensory feedback contributes to movement control, including the role of reflexes in neural control of movements such as walking and grasping and the importance of feedback from sensory receptors in the skin, and how intrinsic properties of neurons within the spinal cord play a role in helping to shape motor output.	 David Collins	University of Alberta	$205,423	$60,969	Life Sciences
05-028-SRI	Functional analysis of the mitotic checkpoint using live cell time-lapse confocal microscopy	Infrastructure to support research to understand the molecular mechanisms of mitotic checkpoint control in mammalian cells. By investigating the molecular mechanism of the mitotic checkpoint, Dr. Chan's research group can better evaluate these genes as potential cancer drug targets as well as contributing to the basic understanding of cancer.	 Gordon Chan	University of Alberta	$670,498	$149,192	Life Sciences

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05-029-SRI	Equipment for Analog and Mixed-Signal Testing of High-Speed Communications Integrated Circuits	Infrastructure to support research in data transfer codes and protocols. Turbo and LDPC codes are now used in cell phones in order to allow us to send and receive information such as pictures. Future applications such as video-on-demand will require even more sophisticated coding schemes and computational technologies. One such innovation, called an analog decoder, could potentially extend battery life in cell phones by a factor of 10.	 Vincent Gaudet	University of Alberta	$376,394	$128,037	ICT
05-032-SRI	Real-time, live-cell imaging of mRNA localization in epithelial cells	Infrastructure to study RNA in fruit fly epithelial cells. RNA, or ribonucleic acid have often been thought of as simply passive messengers transmitting genetic information from the DNA in the nucleus to the cytoplasm and synthesizing proteins. But the new picture, which has come sharply into focus as the result of Dr. Simmond's work, shows the small RNAs at the helm of many of the cell's genetic workings.	 Andrew Simmonds	University of Alberta	$610,361	$164,132	Life Sciences
05-033-SRI	Molecular analysis of *Helicobacter pylori:* the cag-pathogenicity island and associated signaling pathways	Research to understand the complex interactions between the human pathogen *Helicobacter pylori* and the eukaryotic cells. *Helicobacter pylori* is associated with the development of several gastric diseases including peptic ulcer disease (PUD), MALT-lymphoma and adenocarcinoma. The research will broaden our understanding of the molecular basis of gastric diseases triggered by *H. pylori,* and may result in the identification of novel targets for drug development.	 Markus Stein	University of Alberta	$525,710	$129,700	Life Sciences
05-034-SRI	Experimental Lung Development and Therapy Core	Infrastructure to support translational research on neonatal cardiopulmonary diseases, including bronchopulmonary dysplasia (BPD) and congenital diaphragmatic hernia (CDH). Dr. Thébaud studies the role of angiogenic growth factors, elastin protecting agents and stem cells to protect/regenerate oxygen-injured lungs in newborn rodents. Dr. Thébaud also explores the mechanisms underlying neonatal pulmonary hypertension in animal models of CDH.	 Bernard Thebaud	University of Alberta	$273,723	$77,412	Life Sciences

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05-035-SRI	Scanning microscopy and vibrational spectroscopy for molecular device research	Infrastructure to support research in composite materials. To approach these goals, the group uses tools to probe and manipulate matter at the nano-scale.	 Robert Wolkow	University of Alberta	$658,899	$181,500	Life Sciences/ Energy/ ICT
05-038-SRI	Infrastructure for Advanced Materials Research in Medical Applications	Infrastructure to support research in tissue mechanics research, and biomechanical engineering research. To approach these goals, the group uses tools to probe and manipulate matter at the nano-scale.	 Jason Carey	University of Alberta	$131,093	$53,236	Life Sciences/ Energy
05-039-SRI	An interdisciplinary program in carbohydrate, medicinal, and computational chemistry	Infrastructure to support research focused in the areas of synthetic chemistry (with a particular emphasis in carbohydrate chemistry), the conformational analysis of oligosaccharides and the design of novel therapeutic agents that act by inhibiting carbohydrate-processing enzymes. The primary research focus is directed ultimately towards the identification of new drugs for the treatment of tuberculosis.	 Todd Lowary	University of Alberta	$338,356	$101,356	Life Sciences
05-041-SRI	Development of a biocatalytic suite for the processing of value-added agricultural commodities	Infrastructure to support research in the industrial application of chemical and biological systems for the catalytic conversion of conventional agricultural products to value-added commodities. Much of the biological work involves production, modification, purification, and design of biocatalytic systems.	 David Bressler	University of Alberta	$416,236	$100,222	Life Sciences/ Energy
05-042-SRI	Imaging Laboratory for Functional Recovery	Infrastructure to support the Seaman Family Research Centre's 3 Tesla magnetic resonance imaging (MRI) technology to prevent, diagnose and treat stroke. The goal is to find new and better ways to display the damaging effects of stroke and quantify the treatment being provided.	 Bradley Goodyear	University of Calgary	$602,016	$147,000	Life Sciences

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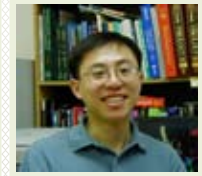
05-043-SRI	Protein crystallization, macromolecular interaction and drug design infrastructure	Infrastructure to support research in understanding how biological macromolecules function at the molecular level. Dr. Ng's lab is particularly interested in understanding how the three-dimensional structures of proteins have evolved to act as highly specific and efficient chemical catalysts (enzymes) or binding proteins.	 Kenneth Ng	University of Calgary	$690,349	$115,301	Life Sciences
05-046-SRI	Facility for the Spectroscopic Studies of Radical Intermediates Formed in the Hot Wire Chemical Vapor Deposition of Semiconductor Thin Films	Infrastructure to investigate the structures, energetics and dynamics of radicals and intermediates formed in the processes of Hot Wire Chemical Vapor Deposition (HW-CVD) of semiconductor thin films. HW-CVD is a new technology to produce device quality silicon-based thin films, which are found to have large potential in low-cost optoelectronic devices (e.g. solar cells) and thin film transistors.	 Yujun Shi	University of Calgary	$770,098	$185,000	Energy/ ICT
06-001-SEG	Remote Monitoring System for Monitoring Numerical and Functional Responses of Wildlife in Dynamic Landscapes	To understand how alterations of natural landscapes by energy sector development interacts with climate change to influence ecosystems, information linking behaviour of animals to population processes is needed. Developments in remote wildlife monitoring will allow us to make innovative advances that will help Alberta grow sustainably.	 Erin Bayne	University of Alberta	$253,824	$58,331	Life Sciences/ Energy
06-002-SEG	Ecological Genomics Laboratory	This funding is for a DNA-typing facility to study genetic structure, pedigree analysis, molecular systematics and gene mapping in wildlife using automated DNA analysis and high-throughput sample handling. The Ecological Genomics Laboratory (EGL) will consist of a wet lab and a separate high-throughput automated DNA fragment analysis suite.	 David Coltman	University of Alberta	$436,502	$100,000	Life Sciences
06-004-SEG	Development of a Porcine Gamete and Embryo Evaluation/ Manipulation Facility	The infrastructure proposed would establish a state-of-the-art reproductive technology facility at the University of Alberta (U of A) Swine Research and Technology Centre (SRTC). Reproductive technologies in livestock represent an efficient means for disseminating genetic resources.	 Michael Dyck	University of Alberta	$390,719	$110,000	Life Sciences

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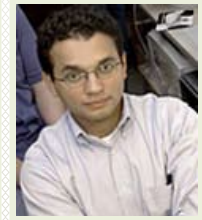
06-005-SEG	Self-Assembled Nanostructured Organic Materials	This proposal makes the case for the acquisition of a state-of-the-art 500 Mhz nuclear magnetic resonance (NMR) spectrometer for the investigation of the 3D structure, dynamics, and quality control of organic molecules, materials, polymers, and macromolecular systems used in nanoscale science and engineering, and nanomedicine.	 Hicham Fenniri	University of Alberta	$1,276,040	$299,056	Life Sciences/ Energy/ ICT
06-008-SEG	Combined Pulsed Laser Deposition - Sputter System for Synthesis of Multiphase Nanostructured Materials and Micro-Devices	Infrastructure for advanced thin-film deposition techniques to synthesize metal-based three-dimensional nanostructured composites for MEMS applications, and the first true on-chip solid oxide fuel cell (SOFC) with tunable dimensions.	 David Mitlin	University of Alberta	$900,000	$270,000	Energy/ ICT
06-013-SEG	Infrastructure for Plant Pathology and Breeding Research	Infrastructure to understand plant pathogen virulence and host resistance. This knowledge will be applied to the development of canola germplasm with improved disease resistance. Research will also aim to produce numerous value-added nutraceutic compounds in canola and to broaden genetic diversity of the crop.	 Stephen Strelkov	University of Alberta	$739,937	$175,000	Life Sciences
06-014-SEG	Development of Cardiovascular Magnetic Resonance Imaging	Magnetic resonance imaging (MRI) is a noninvasive diagnostic imaging modality that yields anatomic and functional images of the beating heart, providing a one-stop shop for diagnosis of heart disease. New designer radio frequency receiver coils (MRI hardware component) will be used to increase the sensitivity of cardiac MRI and provide significantly faster imaging than is currently available.	 Richard Thompson	University of Alberta	$120,044	$36,013	Life Sciences
06-015-SEG	Building a pediatric N-of-1 research service	This project is focused on enabling the development of a first class research facility that will allow for product based clinical research in the area of pediatric medicine and natural health products. In particular, the equipment requested will enable the development of a pediatric N-of-1 service that specializes in NHP evaluation.	 Sunita Vohra	University of Alberta	$300,786	$90,236	Life Sciences

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06-016-SEG	Infrastructure for the Study of Gut Microbial Communities	In vitro continuous culture simulations of the gastrointestinal microflora, in combination with molecular and cell biology techniques, will be used to analyze the role of gut microbial structure and function on the aetiology of Inflammatory Bowel Disease (IBD).	 Emma Allen-Vercoe	University of Calgary	$493,838	$148,149	Life Sciences
06-020-SEG	A Molecular Biology Laboratory to Study HIV and WNV Pathogenesis	To establish infrastructure to study the molecular mechanisms underlying the pathogenesis of both Human Immunodeficiency virus and West Nile virus. In addition, therapeutic strategies for West Nile virus-induced neurological disease will be explored, and antiviral drug resistance of the Human Immunodeficiency virus will be studied.	 Guido van Marle	University of Calgary	$214,711	$64,413	Life Sciences
06-022-SEG	Centre for Integrative Chronobiology	This grant will help establish novel and fundamental infrastructure necessary to study the inner-workings of the mammalian circadian system at the behavioural, anatomical and molecular levels, with the ultimate goal of developing pharmacological or behavioural interventions for sleep and circadian disorders.	 Michael Antle	University of Calgary	$197,358	$59,207	Life Sciences
06-023-SEG	Canadian Satellite Altimetry Database & Processing System (CADS)	It is proposed to develop a satellite altimetry database system with user-specific product generation and on-line dissemination to support research and engineering in climate change, sea level change, surface water and hydrology, and surface deformation. The infrastructure consists of computer hardware and in-house developed software.	 Alexander Braun	University of Calgary	$547,463	$146,250	Life Sciences/ Energy/ ICT
06-025-SEG	Generation of a *C. elegans* Facility to Study the Control of Stem Cell Proliferation	Dividing stem cells have the ability to either remain a stem cell or to differentiate into a specific cell type. The proposed infrastructure will be used to identify and characterize new factors that are involved in regulating this decision using the *C. elegans* germ line as a model.	 David Hansen	University of Calgary	$383,516	$53,601	Life Sciences

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06-027-SEG	Establishment of a Tissue and Cellular Engineering Research Facility	This project will establish infrastructure at the University of Calgary to support tissue and cellular engineering research efforts. This research will be conducted by two new faculty members (C. Hunter and K. Rinker), and will also be used to recruit up to three new faculty to the Centre for Bioengineering Research and Education.	 Christopher Hunter	University of Calgary	$342,104	$102,631	Life Sciences
06-028-SEG	A Cell Biology Laboratory (CBL) for the Institute of Biocomplexity and Informatics (IBI)	This application will result in the establishment of a Cell Biology Laboratory (CBL) for systems biology-biocomplexity research, headed by Dr. Stuart Kauffman (IBI's Director) at the University of Calgary. The CBL will support extensive research, collaborations, training and technology transfer activities.	 Stuart A. Kauffman	University of Calgary	$1,775,768	$532,730	Life Sciences
06-030-SEG	Research Tools for Cardiac Electrophysiology	The purpose of this application is to develop a research lab specializing in cardiac electrophysiology for Dr. Nygren and his students. Two experimental setups are requested: one for measurements at the tissue level, and one for measurements at the cellular level.	 Anders Nygren	University of Calgary	$444,390	$100,000	Life Sciences
06-032-SEG	Confocal Imaging System for the Analysis and Optimization of Engineered Tissues Generated from Mammalian Stem Cells for Therapeutic Applications	A confocal imaging system is requested to characterize and model cultured stem cells, and the tissues generated from them. The proposed infrastructure will greatly facilitate the development of protocols aimed at scaling-up stem cell/tissue production for clinical applications such as the treatment of Parkinson's disease and diabetes.	 Arindom Sen	University of Calgary	$789,519	$236,856	Life Sciences

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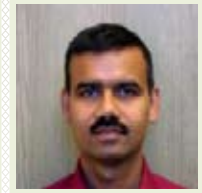
06-034-SEG	Research Facility for Laboratory Spectroscopy of Terrestrial and Outer Planetary Molecules	An ultra-high resolution laboratory for molecular spectroscopy studies of atmospheric constituents. The research will develop spectroscopic tools needed to study molecules of environmental interest and interpret remote sensing data.	 Adriana Predoi-Cross	University of Lethbridge	$295,072	$88,521	Life Sciences/ Energy
06-036-SEG	Ultra-Trace Clean-Laboratory for Environmental and Human Health Sciences Research on Emerging Organic Contaminants	The new infrastructure will enable a broad range of new studies relating to the fate of chemicals in the environment, their exposure pathways, and their possible effects on health.	 Jonathan W Martin	University of Alberta	$819,602	$183,586	Life Sciences
06-039-SEG	Project planSys: 3-D VR Planning System for Surgical Treatment of Lung Cancer	The project focuses on the research and development of planSys - a three-dimensional (3-D) surgical planning system for treating lung cancer - by using the advanced technologies of virtual reality (VR).	 Yaoping Hu	University of Calgary	$441,220	$132,366	Life Sciences
06-040-SEG	Supramolecular Interfaces Research Facility (SIRF)	Research laboratory to study novel approaches to solar cells. The research investigates synthetic organic approaches to create self-assembling surface components, based on photosynthetic reaction centres, to create functional photovoltaic devices.	 Todd C. Sutherland	University of Calgary	$431,827	$129,548	Energy
06-041-SEG	Laboratory for Advanced Materials Science - Fuel Cells, Sensors and Batteries (LAMS-FSB)	The state-of-the-art equipment for the investigation of materials for solid oxide fuel cells, proton exchange membrane fuel cells, sensors and batteries.	 Venkataraman Thangadurai	University of Calgary	$662,612	$198,784	Energy

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06-043-SEG Project Cancelled	Cell Culture and Molecular Virology Infrastructure for Development and Enhancement of Baculovirus-based Technologies	Development of baculovirus-based platform technology for protein and vaccine production using insect bioreactors and targeted gene delivery in mammals by engineering baculovirus surface proteins.	 Oliver Lung	University of Lethbridge	$360,757	$108,277	Life Sciences
07-001-SEG	Fabrication and Testing Facilities for Carbon Nanotube-based Devices and Circuits	Dr. Chen will purchase equipment that will allow him to build accurate and sensitive carbon nanotube-based devices and circuits with carbon nanotubes a very promising and tiny building material. The carbon nanotube structures could be of benefit in biomedical areas such as in the development of small yet robust and sensitive devices for diagnosis and treatment of diseases such as cancer. Carbon nanotube circuits could bring energy savings to consumer electronics and could replace the silicon processing chip in computers.	 Jie Chen	University of Alberta	$560,232	$168,070	Other/ Multi-discipline
07-002-SEG	Novel Reservoir Simulation Using Parallel and Hardware Acceleration	Dr. Gates' award will fund the development of a next-generation reservoir simulator that will evaluate oil and gas resources and determine more efficient ways to develop, maintain, and produce a given reservoir. His new approach to reservoir simulation would incorporate more chemical and physical factors and use more computing power. Dr. Gates' reservoir simulator will be the first of its kind in Canada.	 Ian D. Gates	University of Calgary	$601,512	$168,983	Energy
07-004-SEG	Tools for Molecular Simulations of Crystal Growth	Dr. Kusalik will establish a computational laboratory to simulate crystal growth, an area of research with many applications. For example, fundamental knowledge about the formation and dissolution of crystals could have industrial applications in several energy-related sectors, including methane recovery, carbon dioxide sequestration and flow assurance in pipeline networks. Dr. Kusalik will also investigate basic questions about ice crystal growth to improve understanding of atmospheric processes, make better climate models and improve weather forecasting.	 Peter Kusalik	University of Calgary	$1,182,327	$250,000	Other/ Multi-discipline

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07-005-SEG	Quantum Cryptography and Communication Laboratory (QC2Lab)	Dr. Tittel will purchase equipment to develop a more secure Alberta-wide communication network through the use of quantum cryptography. Quantum cryptography offers security which is guaranteed by the laws of nature, meaning this security cannot be compromised by new technologies. By establishing a quantum cryptography and communication laboratory, the University of Calgary positions itself to become a world leader in information security.	 Wolfgang Tittel	University of Calgary	$2,092,147	$627,644	ICT
07-006-SEG	Development of a yeast facility for the study of lipid metabolism and lipid mediating signalling	Dr. Zaremberg will purchase specialized equipment to help in the study of natural fats, or lipids, and their role in healthy and diseased cells. This basic research may have important consequences in biomedical research pertaining to drug development and treatment of lipid-related diseases.	 Vanina Zaremberg	University of Calgary	$206,291	$61,888	Life Sciences
07-008-SEG	Laboratory for the Synthesis and Characterization of Phosphaorganic and Organometallic Materials for Molecular Electronics, Optoelectronics and Catalysis	Dr. Baumgartner experiments with using organic compounds to build molecular electronic devices that can be used for applications such as light-emitting diodes (LEDs). The SEG award will be used to purchase specialized equipment which will allow Dr. Baumgartner to investigate new compounds for electronics applications.	 Thomas Baumgartner	University of Calgary	$277,069	$83,121	Other/ Multi-discipline
07-009-SEG	Measuring Communication between the Endoplasmic Reticulum (ER) and Mitochondria with Novel Fluorescent Probes in Live Cells	The project aims to observe the communication between two intracellular organelles, the endoplasmic reticulum and mitochondria, *in vivo*. This communication is a major determinant of cellular fate and often malfunctions in cancer tissue or upon neurodegeneration.	 Thomas Simmen	University of Alberta	$674,024	$202,207	Life Sciences

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07-011-SEG	A Glycoengineering Laboratory	Dr. Feldman will purchase dedicated lab equipment to investigate new treatments for autoimmune diseases and cancer by using bacteria to make the active components. Dr. Feldman is a member of the Alberta Ingenuity Centre for Carbohydrate Science (AICCS) where his research group's work complements and extends the applications of Alberta's internationally recognized team of carbohydrate researchers.	 Mario Feldman	University of Alberta	$425,741	$127,722	Life Sciences
07-012-SEG	Establishment of a Facility for Molecular and Cellular Analysis in Pharmacy and Pharmaceutical Sciences	Dr. Seubert's SEG award will be used to purchase dedicated lab equipment for the investigation of the cardioprotective characteristics of naturally occurring compounds, with the aim of protecting the heart from stress related injury and developing new treatments for heart disease.	 John Seubert	University of Alberta	$394,786	$118,442	Life Sciences
07-015-SEG	Hybrid Device Facility for Molecular Electronics	Dr. McCreery will develop a facility within the National Institute for Nanotechnology that will accommodate the unique requirements for making and studying molecular electronics, which is when molecules are used as circuit components within electronic devices. The hybrid device facility will be used as the core of Dr. McCreery's research group's needs, but will also be available to other researchers, becoming an important asset of the whole nanotechnology base being built in Alberta.	 Richard McCreery	University of Alberta	$874,160	$262,248	Other/ Multi-discipline
07-017-SEG	Environmental Stress and Hydraulic Limits on Tree Performance: The Ecophysiology of Adaptation to Stress	Dr. Tyree will purchase equipment to study cold and drought stresses in an important Alberta tree species, the poplar. By identifying the characteristics in a tree which make it particularly well adapted to stress, Dr. Tyree will give the forestry industry important information to use in tree-improvement breeding programs.	 Melvin T Tyree	University of Alberta	$537,604	$161,281	Life Sciences

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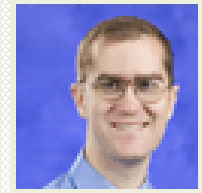
07-018-SEG	Single Molecule Fluorescence Laboratory for Probing Plasma Membrane Enzymology in Single Cells Using Chemical and Spectroscopic Tools	Dr. Cairo will use the SEGP award to establish a specialized laboratory that is able to observe the movement of individual molecules within a living cell. Dr. Cairo intends to develop new fluorescence tags for components of the living cell so that we may discover more about its dynamics. Researchers trained in Dr. Cairo's program will become valuable assets in Alberta's life sciences sector, as the technology is used in pharmaceutical research, development of new diagnostics for disease, and the chemical industry.	 Christopher W Cairo	University of Alberta	$619,588	$185,876	Life Sciences
08-001-SEG	Women and Exercise: Infrastructure for Understanding a Complex, Integrative Physiology	Dr. Billaut's research addresses the question of sex differences in skeletal muscle fatigue. The neuromuscular and metabolic functions will be originally studied, and the role of a revolutionary model of muscle fatigue will be envisaged. His multi-disciplinary investigations will provide crucial information on the female physiology to enhance health and sport performance.	 Francois Billaut	University of Lethbridge	$289,032	$86,710	Life Sciences
08-002-SEG	Infrastructure for Molecular Evolutionary Ecology Laboratory	New equipment to examine genetic changes in Alberta's bird populations, and using this information to discover how bird populations respond to changes in their environment. Government and industry can use the information to develop policies to support sustainable development and to protect wildlife in Alberta.	 Theresa Burg	University of Lethbridge	$197,928	$59,378	Life Sciences
08-003-SEG	Research facility for organometallic chemistry, catalyst development and new material synthesis	Dr. Hayes will use the equipment to develop new ways to create materials with the aim of reducing production costs and unwanted byproducts that may impact the production of materials such as pharmaceuticals, electronics and farm chemicals.	 Paul Hayes	University of Lethbridge	$297,802	$89,341	Life Sciences, Energy, ICT

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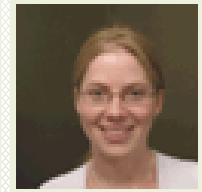
08-004-SEG	Molecular Mechanisms of Small Ribonucleoproteins	New research infrastructure addresses the function and structure of small ribonucleoproteins, essential cellular complexes consisting of RNAs and proteins. Kothe's multi-disciplinary investigations will provide crucial information on the building principles of cellular machines and the molecular causes of diseases.	 Ute Kothe	University of Lethbridge	$329,440	$98,832	Life Sciences
08-005-SEG	An Immunobiology Laboratory for Analysis, Purification, and High Throughput Automated Screening of Immune Cells and their Receptors	Dr. James Stafford will use the grant funds to establish a biological laboratory to study aspects of the fish immune system that help to remove virus-infected cells and tumours. His collaborations with biomedical researchers will help to transfer the research results to investigations of human immunotherapy.	 James L. Stafford	University of Alberta	$412,877	$123,863	Life Sciences
08-006-SEG	The regulation of microtubule dynamics and microtubule-based processes in living cells	Dr. Martin Srayko will buy a state-of-the-art microscope and other supporting equipment to get a detailed view of the internal structure and dynamics that control a cell's shape. The research will contribute to the basic understanding of cell division, an important aspect of cancer research.	 Martin Srayko	University of Alberta	$866,303	$90,000	Life Sciences
08-007-SEG	Integrative Genomics in Forest Trees: Scaling from Molecular to Ecophysiological Processes	Genomics technologies can be used in forestry to discover genes that regulate important processes such as wood production, how trees prepare for winter, or how they defend themselves against pests like the mountain pine beetle. Diagnostic genetic markers developed using genomics have applications in tree improvement and ecological monitoring.	 Janice Cooke	University of Alberta	$355,726	$106,718	Life Sciences
08-008-SEG	The role of the tumor suppressor protein, RASSF1A, in cancer and inflammation	Dr. Baksh will use the award to purchase specialized equipment to study the molecular mechanisms of inflammation. Dr. Baksh's research could lead to earlier cancer detection and a better understanding of possible genetic links to Crohn's disease.	 Shairaz Baksh	University of Alberta	$368,786	$103,256	Life Sciences

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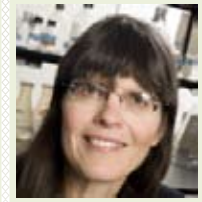
08-009-SEG	Non-genetic cell phenotype variability in cell fate commitment and tumor progression	Dr. Huang will purchase equipment to investigate why genetically identical cells within a group of cells behave differently. This research may help to better understand cancer and stem cell behaviour and contribute to the field of regenerative medicine.	 Sui Huang	University of Calgary	$785,811	$235,743	Life Sciences
08-010-SEG	The Andrology Research Centre for the study of regulation of sperm function and its contributions to early embryo development	The purpose of this proposal is to develop a world-class Andrology Research Centre for studying the regulation of male fertility with the long-term goal of developing an innovative approach for identifying fertile bulls at their earliest possible age and advancing knowledge relevant for understanding male-factor infertility at an interdisciplinary level.	 Jacob Thundathil	University of Calgary	$636,400	$190,920	Life Sciences
08-011-SEG	Alberta Bone and Joint Health Technology Assessment Decision Support Laboratory	Using health technology assessment in a practical iterative framework to inform evidence-based treatment and policy decisions about those suffering with bone and joint conditions. This research will lead to the development of new evidence-based approaches to improve the quality and efficiency of bone and joint care.	 Deborah Marshall	University of Calgary	$293,760	$88,128	Life Sciences
08-012-SEG	CCBN Imaging Centre Upgrade	Dr. Robert Sutherland will purchase specialized equipment to enhance the overall use of the imaging equipment, enabling the CCBN researchers to operate their suite of equipment at a lower cost, improve imaging capabilities, and ensure that this internationally recognized research team remains at the forefront of their field.	 Robert J. Sutherland	University of Lethbridge	$523,930	$157,170	Life Sciences
08-013-SEG	*In vivo* imaging laboratory	Dr. Catherine Chan will purchase *in vivo* imaging equipment that can be used for multiple fields of medical research, especially diabetes. The specialized equipment enables the researcher to relate results from a living system to earlier results discovered in tissue culture, making the imaging laboratory a powerful tool for Alberta's diabetes researchers.	 Catherine B. Chan	University of Alberta	$360,826	$108,247	Life Sciences

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08-015-SEG	The contribution of reactive glia to central neuropathic pain	New equipment to research chronic pain, particularly the neuropathic pain related to multiple sclerosis and spinal cord injuries, at the molecular and cellular levels. Dr. Kerr's lab will offer valuable training experience to graduate students and postdoctoral fellows for Alberta's biotechnology sector.	 Bradley Kerr	University of Alberta	$312,100	$93,630	Life Sciences
08-016-SEG	Study of regulatory pathways controlling lipid and cholesterol metabolism in *Drosophila*	Dr. Kirst King-Jones will use the grant to purchase equipment for research in lipid metabolism, which supports human growth, development and health. By using genomic and fluorescent microscopy techniques, he will identify important genes related to metabolic processes, and especially those that are involved in the regulation of fat, sugar and energy.	 Kirst King-Jones	University of Alberta	$344,826	$103,448	Life Sciences
08-017-SEG	Thermal-sprayed nanostructured Coatings for Equipment in the Natural Resource Sector	Dr. André McDonald will purchase specialized tools to make and test nanostructured titania coatings on gas pipelines and other mechanical equipment in order to prevent rust damage. He aims to bring the technology to commercialization, helping Alberta's oil and gas industry combat corrosion cracking and oil sand slurry wear.	 André G. McDonald	University of Alberta	$332,741	$99,822	Life Sciences, Energy, Nanotechnology
08-019-SEG	Optical instrumentation for the investigation of industrial flows related to oil sand and energy production	Advanced optical instrumentation, tomographic particle image velocimetry (TomoPIV) will be used to investigate flow problems and phenomena related to the production of oil sand. This measurement system combined with a unique flow facility under development will allow fundamental and applied research and will be a one-of-a-kind in the world.	 David S. Nobes	University of Alberta	$283,293	$84,989	Energy

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08-021-SEG	Scientific Computing Infrastructure for CO2 Injection Enhanced Oil Recovery	Dr. Chen will purchase computing infrastructure to allow him to make highly detailed computer simulations of CO2 sequestration and improve the efficiency of oil recovery from reservoirs. Dr. Chen's research will help in the global effort to find solutions to minimize greenhouse gas emissions.	 Zhangxing (John) Chen	University of Calgary	$1,171,878	$351,563	Energy
08-022-SEG	Development of a cell biotechnology suite to evaluate functional feeds and their impact on animal immunity and health	Dr. Barreda will use the award to purchase the tools he needs to test various fractions of Alberta crops, including barley, for their positive impact on livestock health. His research offers the potential for Alberta's agricultural sector to find added value from the crops they produce.	 Daniel R. Barreda	University of Alberta	$420,537	$126,161	Life Sciences
08-023-SEG	New Imaging Technologies to Study Immune Receptors at the Single Molecule Level	The new research focuses on gaining a better understanding of our immune system's ability to protect us against fungal infections. Dr. Touret's research may lead to strategies that prevent fungal infections, and his techniques and the new equipment offer an excellent research and training opportunity in advanced imaging techniques for his colleagues and students.	 Nicolas Touret	University of Alberta	$919,175	$225,720	Life Sciences
08-024-SEG	Low Background Counting Facility at the University of Alberta	Dr. Krauss will purchase equipment for research in the area of astroparticle physics. He will build unique and highly sensitive detectors which will improve the search for dark matter, a search that is an international effort. Dr. Krauss's research contributions are of high international significance and build upon Canada's recognized strengths in the field of astroparticle physics.	 Carsten Krauss	University of Alberta	$200,000	$60,000	Other

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08-025-SEG	Comprehensive multi-dimensional gas chromatography - time-of-flight mass spectrometry facility for advanced research in gas-phase separation science	Dr. Harynuk will purchase specialized equipment that allows him to measure small amounts of compounds in samples that would otherwise be difficult to measure using conventional methods. His research and expertise in analytical chemistry can be applied to many areas, including analysis and new techniques related to tailings mixtures from the oil and gas industry, agricultural products, and health research.	 James Harynuk	University of Alberta	$377,065	$90,000	Life Sciences, Energy
08-026-SEG	The integration of development, genetics, and phylogenetics to understand mechanisms underlying diversity of important fruit and floral traits in plants	Dr. Hall will purchase equipment that allows her to investigate and compare the genetic connections between canola, and a related and well-studied plant, Arabidopsis. In particular, she will study the genetic control of flower and fruit development in plants that share the same family as canola, which may lead to the development of better control strategies for early pod shattering. In using a genetic approach, Dr. Hall will introduce important molecular techniques to the next generation of researchers.	 Jocelyn Hall	University of Alberta	$301,836	$90,551	Life Sciences
				TOTAL:	$70,248,691	$20,822,690	