



Knowledge creation through international collaboration

Highlights from Phase 6 (2011-2014) of the Canada-Latin America
and the Caribbean Research Exchange Grants (LACREG) program

Introduction

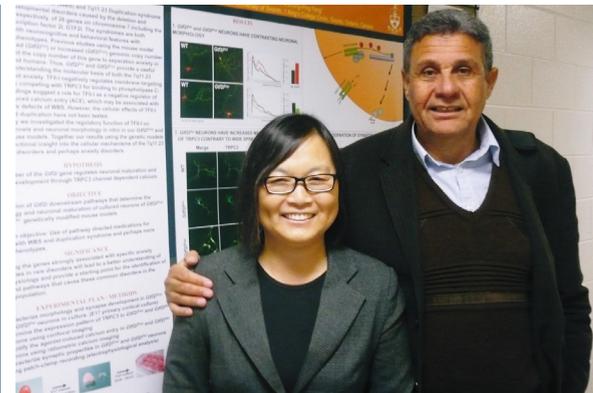
From tracking the use of crack cocaine in Brazil to examining the effects of air pollution on children in Mexico to exploring the impact of mining operations on local economies, the most recent phase of the Canada-Latin America and the Caribbean Research Exchange Grants (LACREG) program supported more than 30 international research projects in a wide range of disciplines and countries.

Since it was established in 1995, the LACREG program has worked to promote international partnerships among academic researchers from Canada and their counterparts in Latin America and the Caribbean as they attempt to solve some of the most pressing challenges facing the region.

The program is managed by the Association of Universities and Colleges of Canada with funding from the International Development Research Centre (IDRC). LACREG supports small collaborative research initiatives that create and disseminate knowledge in IDRC's four priority research areas: agriculture and the environment; science, technology and innovation; social and economic policy; and global health policy. Through a competitive funding process, the program provides up to \$15,000 per project, largely to cover travel expenses. Since its founding, LACREG has funded over 300 research partnerships.

In Phase 6 of the program, which ran from 2011 to 2014, LACREG awarded almost \$400,000 to 32 projects in 12 countries. It helped forge new international collaborations that have facilitated knowledge-sharing and capacity-building, including the exchange of new laboratory techniques and the training of graduate students. The partnerships also resulted in important findings that informed public health, municipal planning and other policy reforms. Findings have been published in major peer-reviewed journals and presented at international conferences and workshops.

This publication highlights examples of research carried out through LACREG Phase 6.



Dr. Marcus Lira Brandao (right) from the Universidade de São Paulo has been collaborating on mental illness research with University of Toronto researchers, including Professor Shang-Ping Feng, Director of the Collaborative Program in Neuroscience.



Researchers from the Universidad de Cienfuegos and Université Laval interview a farmer as part of their agroforestry study in Cuba.

LACREG Phase 6:

By the numbers

Competitions: 2

Project applications received: 128

Grants awarded: 32

12 Latin American and Caribbean countries

20 Canadian institutions involved in the projects

31 Latin American and Caribbean institutions involved in the projects

Distribution of projects by Latin American and Caribbean country



Provincial distribution of Canadian institutions



Argentina

- Researchers from the the Consejo Nacional de Investigaciones Científicas y Técnicas and the University of Toronto teamed up to find out why drugs used to treat psychiatric disorders can contribute to the onset of metabolic diseases such as **diabetes**. The LACREG grant allowed Argentine researchers to learn new Canadian lab techniques that will improve diabetes research in their home country.
- Diabetes was also the focus of a collaborative effort between researchers at the University of Saskatchewan and the Universidad de Buenos Aires. The main objective of this project was to study the link between **diabetes** and the progression of **Alzheimer's disease**. The findings provided evidence for the first time of a link between these two devastating diseases. They were presented at a major Alzheimer's conference and were also the subject of two academic papers.
- A team from Simon Fraser University and two Argentinian universities, the Universidad Nacional de Luján and the Universidad Nacional de Tres de Febrero, investigated **Chagas disease**, a little-understood but serious public health problem afflicting rural indigenous communities in Argentina's Chaco province. The participants worked with members of the Qom indigenous people to document conditions affecting their community health, especially Chagas, through photography. A photo exhibit with accompanying narratives was then presented to provincial and national policymakers.
- Researchers at the University of Manitoba and the Universidad de Buenos Aires teamed up to identify the most prevalent strains of *Burkholderia cepacia* complex, or Bcc, a group of bacteria found in patients with **cystic fibrosis** that lead to lung deterioration and death. The researchers sequenced the genomes of the Argentinian Bcc isolates and confirmed that they belonged to the Bcc family but represented a new taxonomic type. The finding will have important consequences on infection control practices and patient care in Argentina.



Dr. Silvia Cardona from the University of Manitoba (right) is interviewed on Radio Universidad de Buenos Aires regarding her work with researchers from UBA on cystic fibrosis.



Members of the Qom indigenous community documented conditions affecting their health, especially Chagas disease, through photography.

Brazil

- Participants from the Université de Montréal and the Universidade de São Paulo examined the impact of auditory training therapy on Brazilian children with **auditory processing disorders**. The therapy consists of software developed in Montreal that was translated into Portuguese. The collaboration provided an opportunity to exchange experimental procedures among labs in the two countries and resulted in the first software available in the Portuguese language used for this purpose.
- A multidisciplinary group from the University of Toronto and the Universidade de São Paulo sought to identify the social determinants that contribute to the onset of **mental illness** in Brazil. The project documented factors that facilitate and impede the implementation of evidence-based mental health programs and services. The findings were used to develop policy briefs for Brazilian government authorities and evidence-based guidelines for implementing mental health services and supports in that country.
- The use of crack cocaine has reached epidemic proportions in Brazil. A group of researchers from Simon Fraser University, the Oswaldo Cruz Foundation, the Universidade Federal do Rio de Janeiro, and the Universidade Federal da Bahia analyzed data from a survey of 160 young crack users in Rio de Janeiro and Salvador, a city in Brazil's northeast. The study shed light on this marginalized group and is one of the few to compare characteristics of male and female crack users. It also informed the development of future **drug prevention and treatment** programs.
- Peri-urban parks face many threats including pollution, invasive species and overuse. Without protection they could face the risk of disappearing altogether. Researchers from the University of Toronto and the Universidade Federal do Rio de Janeiro conducted studies of Guaratiba Biological Reserve in Rio de Janeiro and Rouge National Urban Park in Toronto to study the relationship between these **protected areas** and the pressures caused by urban growth. The teams used satellite imagery, on-site surveys and interviews to gain a better understanding of the characteristics of these areas and the threats they face.



Dr. Francisco Bastos together with members of his research group at the Oswaldo Cruz Foundation helped carry out a study of crack users in Rio de Janeiro.



Researchers from the University of Toronto and Universidade Federal do Rio de Janeiro survey the Guaratiba Biological Reserve to better understand the characteristics of this protected area.

Cuba

- A team of scientists from Université de Montréal, Université du Québec à Montréal, Cuba's Centro de Química Biomolecular and CENSA examined *Streptococcus suis*, an emerging pathogen that can lead to **infections in swine**, an important source of animal protein throughout Latin America and the Caribbean. The infection can be transmitted to humans and cause serious health consequences and even death. There is no effective vaccine available. This collaborative effort allowed Cuban researchers, using techniques they had learned in Canada, to set up a diagnostic program to identify the pathogen. The group also organized an international symposium on *S. suis* and plans to seek funding to begin production of a prototype vaccine.
- Researchers from the University of Saskatchewan and CENSA used genomic technologies to develop a **poultry vaccine** to target a pathogen that limits poultry production in many parts of Latin America and the world. Vaccine testing is set to begin in Cuba.
- A team from Kwantlen Polytechnic University and the Dirección Provincial de Sanidad Vegetal worked to develop an ecologically friendly method to control two highly damaging and costly **crop pests** in Cuba. In the first phase of the project, researchers conducted trials to compare the native Cuban pests with those from other Latin American countries and to develop protocols to control the host insect. A new method for rearing larvae was developed and is now in use in Cuba. In the second phase of the project, researchers conducted field trials of the pesticides in Cuba on corn, showing early promising results.
- Rising sea levels, desertification, drought, and hurricanes are some of the problems faced by coastal areas as a result of climate change. Developing and implementing **Integrated Coastal Zone Management** plans are an important part of dealing with these effects. Project partners at the Universidad de Oriente and Dalhousie University worked together to develop two new courses for a master's program in Coastal Zone Management taught at the Universidad de Oriente. A risk management workshop was held in Cuba for academics and government officials, where plans were developed for implementing some of the risk concepts in municipal planning.



Students conduct group work as part of a coastal risk management course developed by the Universidad de Oriente and Dalhousie University.



Dr. Deborah Henderson from Kwantlen Polytechnic University and Dr. Jorge Luis Ayala from the Dirección Provincial de Sanidad Vegetal conducted field trials of ecologically friendly pesticides to control two highly damaging crop pests.

Jamaica

- Researchers from Queen's University and the University of the West Indies examined how **underprivileged youth of African-Caribbean descent** in Montreal and Kingston, Jamaica experience poverty, violence and social justice in their environments. They conducted interviews with young people in Montreal's Little Burgundy and Kingston's Rose Town neighbourhoods to see what strategies they used to overcome daily challenges and struggles. The young people from the two countries were able to communicate with one another, compare experiences, and think creatively about ways they might use to overcome their struggles.
- A group from Ryerson University and the University of the West Indies explored the experiences of **young pregnant women** in Jamaica and the impact of pregnancy on their psychological health. They conducted focus group interviews with young girls attending teen pregnancy clinics. Preliminary results indicate that the young mothers experienced barriers to education, family planning and self-determination. The outcomes will inform future delivery of maternity care services and policy in Jamaica.



Murals in Kingston's Rose Town represent tributes to community members. Researchers from UWI and Queen's University examined how underprivileged youth of African-Caribbean descent in Rose Town experience poverty, violence and social justice.



Dr. Karline Wilson-Mitchell (left) from Ryerson University with members of the National Aboriginal Council of Midwives. Dr. Wilson-Mitchell was invited by NACM to propose a replication of the LACREG study in two Aboriginal communities.

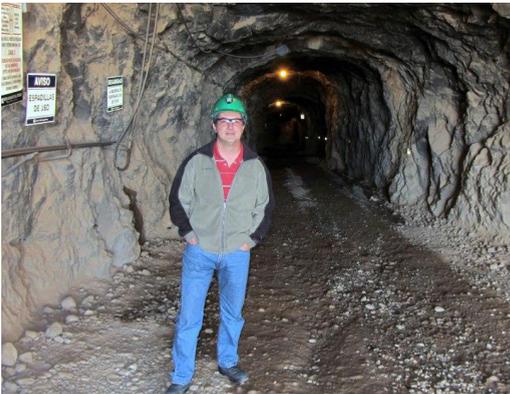
Mexico

- The impact of **air pollution** on children is a major public health concern all over the world, with millions of children at risk. Scientists from Carleton University and Mexico's Instituto Nacional de Pediatría studied the effects of extreme air pollution on attention, concentration, working memory and other brain functions in young children. The study included three cohorts of eight-year-old children from Mexico City who had been exposed to extreme air pollution and a group that hadn't. The children underwent a battery of tests to pinpoint the cognitive processes that were affected in the highly-exposed group. The researchers measured attention, concentration, working memory, recall and retention, and memory. The results will expand scientific understanding of how air pollution influences cognitive performance and can be used to develop future policies and strategies that could limit the development of degenerative diseases such as Alzheimer's in high-risk groups.
- The Mexican state of Zacatecas has one of the highest rates of rural outmigration in the country. It also has an abundance of natural resources, including silver. Researchers from the Universidad Autónoma de Zacatecas, Saint Mary's University, development agencies and local activist organizations held a workshop to discuss the policy implications of **resource extraction** in the region, where Canadian mining companies have been particularly active. Presenters at the workshop provided a comparative analysis of resource extraction activities in Peru, Bolivia and Colombia.



Peru

- Professors from the Université de Montréal and the Universidad Peruana Cayetano Heredia produced a portrait of **gastrointestinal diseases** in the region of Tumbes and developed a research project that would test prevention measures. They visited local health centres, industry groups and health authorities to determine which gastrointestinal illnesses are of most concern in the region.
- Another group from the University of Saskatchewan with the Universidad Peruana Cayetano Heredia worked to combat the spread of an antibiotic-resistant strain of **gonorrhoea**. The researchers worked to establish a network of laboratories and train health workers to perform diagnostic testing of the disease. It also kick-started research into the molecular epidemiology of this gonorrhoea strain to provide better prevention and treatment guidelines. A laboratory course was led by researchers for lab staff in Peru. In addition, the researchers collected and tested gonorrhoea isolates to implement country-wide surveillance of the disease. The work has already had a direct impact on public health policy regarding diagnosis and treatment of the disease.
- Investigators from the North-South Institute, La Pontificia Universidad Católica del Perú, FLACSO Argentina and the Universidad de San Juan looked at the effects of Canadian **mining operations** in those countries. The researchers conducted field work and one member of the team presented their findings to Canadian members of parliament examining Canada-Latin American relations.



Dr. Pablo Heidrich from the North-South Institute at the Manantial Espejo Mine in Argentina.



A team from the Universidad Peruana Cayetano Heredia and the Université de Montreal visit a village water collection and treatment centre in Tumbes as part of their research on gastrointestinal diseases in the region.

Trinidad and Tobago

- Professors from the University of Trinidad and Tobago and McGill University examined the possibility of introducing **precision irrigation technologies** in Trinidad and Tobago to facilitate land and water conservation and to promote food security. The participants conducted field visits to farms in the two countries. They conducted interviews with farmers and with officials from the agriculture industry.
 - Researchers from the University of Trinidad and Tobago and the University of Waterloo investigated the role universities play in improving **national competitiveness and innovation**. In particular, they examined how certain graduate programs in developing countries contribute to a country's innovation capacity. The team conducted an in-depth comparative case study that looked at curricula, industry linkages and the activities of the master of business, entrepreneurship and technology program at the University of Waterloo and the master of science in industrial innovation, entrepreneurship and management at the University of Trinidad and
- Tobago. Although the programs shared similar aims, the ability to achieve those goals depended on the broader university culture and community and on institutional linkages. The research helped inform revisions to the master's program at the University of Trinidad and Tobago.
- The aim of the **Public Participatory Geographic Information System**, a computer software program developed at the University of New Brunswick, is to facilitate the participation of community members in the planning and decision-making process. Researchers from the University of the West Indies visited their counterparts at the University of New Brunswick to obtain PPGIS training and technical skills so that they can use the software to support adaptation planning for rising sea levels. The system is set to be rolled out in certain coastal communities in Trinidad and Tobago.



Mr. Titus Tienaah (right) from the University of New Brunswick demonstrates PPGIS functionalities to researchers at the University of the West Indies.



Dr. Nadine Sangster (middle) from the University of Trinidad and Tobago and Ms. Kerri Edwards, a McGill University master's student, at Wayne Palichuk's farm in Leamington, Ontario. The researchers explored the possibility of introducing precision irrigation technologies in Trinidad and Tobago.

LACREG Phase 6: 2011-2014 projects

ARGENTINA

Unraveling the effects of neuroleptics on diabetes onset

The Consejo Nacional de Investigaciones Científicas y Técnicas with the University of Toronto

The role of RAGE in central nervous system abnormalities: diabetes and the development of Alzheimer's disease

The University of Saskatchewan with the Instituto de Biología Celular y Neurociencia at the Universidad de Buenos Aires

From indigenous households in the Gran Chaco region to national policy in Argentina: Knowledge translation for Chagas disease prevention

Simon Fraser University with the Universidad Nacional de Luján and the Universidad Nacional de Tres de Febrero

Overcoming the knowledge gap between *Burkholderia cepacia* complex-related infections in cystic fibrosis (CF) patients from North America and Argentina
The University of Manitoba with the Universidad de Buenos Aires

BOLIVIA

From theory to practice: Identifying and activating community capitals for sustainable local economic development
Simon Fraser University with the Universidad Mayor de San Andrés

BRAZIL

Auditory rehabilitation of Brazilian children with auditory processing disorder
The Université de Montréal with the Universidade de São Paulo

Food security and food sovereignty: Connecting sustainable agriculture with the right to food through urban school feeding programs in Canada and Brazil
The University of British Columbia with the Universidade de São Paulo

Unraveling the social determinants of mental health: A Brazilian perspective
The University of Toronto with the Universidade de São Paulo

Ecotourism and the sustainability of natural resources in peri-urban areas: a case study of Guaratiba in Rio de Janeiro

The University of Toronto with the Universidade Federal do Rio de Janeiro

Assessing drug use, health & social outcomes of marginalized crack users, and developing bilateral follow-up studies on interventions for crack users in Canada & Brazil

Simon Fraser University with the Oswaldo Cruz Foundation, the Universidade Federal do Rio de Janeiro and the Universidade Federal da Bahia

CHILE

Applying biotechnological solutions to aquaculture food security
The University of Waterloo with Pontificia Universidad Católica de Valparaíso

COLOMBIA

Extractivism, development and forced displacement in Colombia, building knowledge networks and generating policy relevant knowledge

York University with the Pontificia Universidad Javeriana

COSTA RICA

Barriers to sexual healthcare in a resource poor tourist area in Atlantic Costa Rica
The University of Manitoba with the Universidad de Costa Rica

CUBA

Establishment of a collaborative program between Canada and Cuba on the prevention of the infection caused by the emerging zoonotic pathogen *Streptococcus suis*
The Université de Montréal, the Université du Québec à Montréal with the Centro de Química Biomolecular and the Centro Nacional de Sanidad Agropecuaria

Developing native viral biopesticides for management of lepidopteran insect pests in Cuba; optimization of production technology and molecular characterization
Kwantlen Polytechnic University with the Dirección Provincial de Sanidad Vegetal

Urban and peri-urban agroforestry for the nutritional and financial security of Cuban households

The Université Laval with the Universidad de Cienfuegos

The flax-PAD study: An international research collaboration
St. Boniface Hospital Research with the Hospital Universitario Lenin

Capacity-building for genomic approaches to animal vaccine development in Cuba
The University of Saskatchewan with the Centro Nacional de Sanidad Agropecuaria

Capacity building for agro-industrial development of essential oil-based pesticides in Cuba

The University of British Columbia with the Centro Nacional de Sanidad Agropecuaria

Integration of risk management methodologies into integrated coastal zone management in Cuba

The Universidad de Oriente, the Centro de Estudios Multidisciplinarios de Zonas Costeras and the Delegación del Ministerio de Ciencia Tecnología y Medio ambiente en la Provincia de Santiago de Cuba with Dalhousie University

GUYANA

Synthetically engineered materials for the sorptive removal of metal species from industrial effluent and ground water sites in Canada and Guyana
The University of Saskatchewan with the University of Guyana

JAMAICA

Caribbean youth, urban governance and the right to the city
Queen's University with the University of the West Indies

Psychosocial factors associated with Jamaican adolescent pregnancy and suicidal behaviour
Ryerson University with the University of the West Indies

MEXICO

Growing up with pollution: Neurocognitive development in Mexico City children
Carleton University with the Instituto Nacional de Pediatría

Resource extraction as a development pathway: Economic and social policies for poverty reduction and rural development
Saint Mary's University with the Universidad Autónoma de Zacatecas

PERU

Ecohealth research on infectious gastrointestinal illness in Peruvian communities
The Université de Montréal with the Universidad Peruana Cayetano Heredia

Action Plan to control the spread and impact of potentially untreatable *Neisseria gonorrhoeae* in Peru: Research and Public Health Model for the Region
The University of Saskatchewan with the Universidad Peruana Cayetano Heredia

TRINIDAD AND TOBAGO

Investigating the applicability of smart irrigation technologies for a small developing island in the Caribbean - Trinidad and Tobago
The University of Trinidad and Tobago with McGill University

Knowledge transfer of public participatory GIS innovation
The University of the West Indies with the University of New Brunswick

Driving national competitiveness through innovation - Exploring the role of universities in innovation systems in Canada and Trinidad and Tobago
The University of Trinidad and Tobago with the University of Waterloo

Strengthening of international research partnerships and consolidation of emerging research networks
The University of Toronto with the University of the West Indies

ARGENTINA AND PERU

Economic impact of Canadian mining in Latin America
The North-South Institute with la Pontificia Universidad Católica del Perú, FLACSO Argentina and the Universidad de San Juan

For more information,
consult AUCC's online database of research exchange projects:
www.aucc.ca/research-exchange-projects/

Photos courtesy of LACREG grant recipients

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The Canada-Latin America and the Caribbean Research Exchange Grants (LACREG) program is designed to strengthen international partnerships and consolidate emerging networks among academic researchers from Canada, Latin-America and the Caribbean.

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