Summary of Activities in 2012

**Highlights of 2012:**

► *Provost’s Priority Pool* – Profs. Reza Salavati and Timothy Geary received approval of their Provost’s Priority Pool project for a new non-thesis M.Sc. program entitled *Global Infectious Diseases*. This will be a Master’s (Applied) interdepartmental program in global health. This initiative demonstrates clear ties with the Institute’s existing emphasis on excellence in research, international collaborations, and global health.

► *Summer course offered* – In the summer of 2012, Profs. John Dalton, Robin Beech and Reza Salavati held a summer *Bioinformatics Workshop*. Funding for this initiative was obtained from the European Union and from the Government of Quebec. Ten participants were from Europe, and 10 participants were from Quebec. The following were invited speakers: Dr. John Parkinson from The Hospital for Sick Children in Toronto and Dr. James Wasmuth from the University of Calgary. Feedback from participants in the *Workshop* was extremely positive.

► *Significant funding successes* – This year was highlighted by major awards: Prichard, WHO; Geary, Gates/Grand Challenges Canada/CIHR; Dalton, European Union; Prichard/Geary, Bayer and Novartis; Beech, CFQCU grant (joint program between the Government of France and Quebec to promote collaboration between Quebec and France).

► *Growth in graduate student numbers* – The Institute of Parasitology had 49 registered thesis research students in September 2012. This is the highest number ever and represents 4.4 thesis-level graduate students per faculty member. In addition, 45 non-thesis biotechnology graduate students and 10 postdoctoral fellows were registered at the Institute during 2012. All these young scholars received state-of-the-art training in parasitology, bioinformatics, molecular biology and the life sciences.

► *Centre for Host-Parasite Interactions Annual Symposium* – The Twelfth Annual Symposium for the FQRNT Centre for Host-Parasite Interactions, hosted by the Institute of Parasitology, was held from May 28-29, 2012. Invited speakers were: Tim Gilberger from McMaster University, Hamilton, Ontario, John Parkinson from The Hospital for Sick Children, Toronto, Ontario, and David Sacks from the National Institutes of Health, Bethesda, Md, USA. This annual event publicizes the strength of research within this Centre provincially, nationally and internationally.
Research and Publications:

In 2012, the Institute’s research was published in 52 peer-reviewed papers/book chapters and was presented at 63 conference presentations. Professors gave 16 invited presentations during the time frame of this reporting period. See list of publications at www.mcgill.ca/parasitology/publications

Research:

► Global Health – Of particular note is the work of Prof. Scott on the intersection of development, nutrition and parasitism in poor areas of Panama and Guatemala under the umbrella of McGill’s Global Health Program. A fruitful partnership has been forged with the Ministry of Health in Panama to direct research into the complex relationship between chronic malnutrition and infectious disease in areas of extreme poverty. The aim is to work with the Panamanian Ministry of Health to define sustainable policies, such as vitamin A supplementation, food vouchers and childhood vaccinations, in a holistic approach.

The following Symposium was organized to provide feedback to health professionals in Panama City and to local health professionals, community leaders and research participants in the rural area of San Félix, Panama:

Symposium “Impactos en la Salud Materno Infantil de Factores Ambientales, Nutricionales e Infecciosos en la Comunidad Indígena Ngäbe-Buglé”. Ciudad de Panamá: 16 May 2012; San Félix, Provincia de Chiriquí, 18 May 2012.

► Drug resistance/discovery - The Institute of Parasitology’s research in the area of chemical biology includes major efforts on screening to identify compounds with potential antiparasitic effects (Dalton, Geary, Jardim, Salavati), on drug development (Geary), on the pharmacology of antiparasitic drugs and mechanisms of drug resistance (Beech, Geary, Georges, Prichard, Rohrbach), and on identification of targets for drug discovery (Beech, Dalton, Geary, Jardim, Ribeiro, Salavati). The ultimate goal is the development of new more effective medicinal treatments and vaccines.

► Gates project for natural product-based drug development in Africa – Most people in developing countries rely on traditional medicines derived from local biodiversity for healthcare. Despite economic growth in the past 10 years, Africa remains plagued by parasitic infections, out of reach of eradication. Profs. Geary/Ubalijoro are using a Gates Foundation/CIHR/Grand Challenges Canada grant to establish an innovative antiparasitic drug development program that promotes local leadership to harness a recombinant yeast-based assay to screen for novel anthelmintic candidates in collections of African natural products. The ultimate goal is to empower African researchers to develop and market sustainable affordable cures for locally important parasitic infections, such as river blindness, lymphatic filariasis and malaria, rather than relying on imported Western technologies.

► Agriculture – Several laboratories at the Institute are actively engaged in research on livestock and companion animal parasites (Beech, Dalton, Geary, Prichard). Drs. Bourguinat/Prichard/Geary discovered a genetic marker for the detection of drug resistance in canine heartworm. This innovation will be commercialized by the pharmaceutical company Novartis.

► Genomics and proteomics – Research in proteomics, centred on identification and characterization of proteins and other molecules secreted by parasites that affect the host or which can be exploited for the development of novel antigen-based diagnostic tools, is an area of rapidly growing interest (Dalton, Geary, Jardim, Ribeiro). Most labs in the Institute have incorporated a component of genomics in their research, but this is a particular area of interest for Profs. Beech and Salavati. Faculty members are also doing research in the area of quantitative biology, bioinformatics and systems biology (Beech, Salavati) with particular emphasis on genome mining.
Teaching and Learning (undergraduate and graduate):

► Undergraduate – The Institute continues to provide essential teaching services in the basic life sciences on the Macdonald Campus (Biochemistry, Bioinformatics, Cell Biology, Immunology, Wildlife Parasitology) and in the Faculty of Medicine.

► Graduate – The Institute graduated 3 Ph.D. students and 3 Master degree students in our thesis research programs in 2012. Yovany Moreno, Marie-Claire Rioux and Hamed Shateri were the Ph.Ds. Doris Gonzalez, Bibiana Gonzalez and James McLean were the M.Sc. In the non-thesis Biotechnology programs, 19 students graduated in the M.Sc. Applied program.

► Visiting students – The Institute hosted 8 international Graduate Research Trainees in 2012. These included: Maren Heimholt from Germany who worked with Prof. Rohrbach; Sima Rostami from Iran who worked in the lab of Prof. Salavati; Abdul Sardar from India, working with Prof. Jardim; Daniel Kulke from the Free University of Berlin in Germany who worked with Profs. Beech and Geary; Peggoty Mutai from the University of Cape Town and winner of a L’Oreal fellowship, who worked in the lab of Prof. Geary; Sara de la Riva from Spain, and Jonas Kengne and Hugues Nana-Djeunga from Cameroon who worked with Prof. Prichard. This demonstrates the international appeal of the Institute. The Institute exposed all these young trainees to cutting edge research in the life sciences.

► Summer students – Ma Ruoyin from the University British Columbia was an undergraduate student who did a stage at the Institute in the lab of Prof. Ribeiro during the summer of 2012. Jill Arnold was an undergrad from The Netherlands who studied in the lab of Prof. Rohrbach. Ivy Mak was the winner of a Summer 2012 NSERC USRA Award which she took up in the laboratory of Prof. Salavati. Stephanie Totten worked in the lab of Prof. Jardim and Carly Langlois in the lab of Prof. Scott. All received advanced research training.

► Visiting Scientists – Dr. Emmanuel Ogbadoyi, from the Federal University of Technology in Nigeria, visited the laboratory of Prof. Geary from May to September 2012. He serves as the Director of the Global Institute for Bioexploration and the Head of the Trypanosomiasis and Malaria Research Unit in Nigeria. Dr. Mike Osei-Atweneboana from Ghana and Dr. Steve Doyle from Australia visited Prof. Prichard’s lab in September 2012 regarding sequencing work for an ongoing onchocerciasis project.

Involvement in the Community:

► In the 12th Annual Food for Thought Lectures Series held on the Macdonald Campus of McGill University, September – November 2012, 3 Institute professors gave Invited presentations: Prof. Timothy Geary’s talk was entitled: Taking the “neglected” out of neglected tropical diseases by building local science capacity; Prof. John Dalton spoke on Fighting malaria: a constant battle, and Prof. Marilyn Scott’s talk was entitled Maternal and child health in Panama: A multidisciplinary eco-health approach.

► Prof. Geary gave two Public Lectures: “Medicines for neglected tropical diseases: reversing the equation”, Cutting Edge Public Lecture, McGill University, 15 March 2012; “Resistance to macrocyclic lactone preventative in the dog heartworm Dirofilaria immitis” at the Université de Montréal School of Veterinary Medicine in Ste-Hyacinthe, on 3 October 2012.

► Drs. Prichard and Geary were members of the Organising Committee for the US Food and Drug Administration Public Meeting on Antiparasitic Drug Use and Resistance in Ruminants and Equines, from March 5-6, 2012, in Rockville, Md, USA. Prof. Prichard also served McGill University throughout the year as Chair of the Faculty of Agricultural and Environmental Sciences Planning Committee, and a
member of the Provost’s Work Group on Service to the Global Community. Dr. Geary chaired a WAAVP Committee on Guidelines for Combination Anthelmintic Products for Livestock and Horses.

► In 2012, the Twelfth Annual Quebec Molecular Parasitology Symposium of the Institute’s Centre for Host-Parasite Interactions was held at Institut Armand Frappier, May 28-29. The keynote speakers were: Dr. Tim Gilberger from McMaster University and Dr. David Sacks, NIH-NIAID, USA. This annual two-day Scientific Meeting typically involves participation from across Quebec and Invited international experts. It is extremely well attended by trainees throughout the Centre.

► On October 23rd, 2012, the Institute’s Biotechnology students organized the 3rd Annual McGill Interdisciplinary Biotechnology Graduate Symposium, called BioConnect 2012. This event was held at the McGill New Residence Hall to create collaboration between industry, the Montreal business community and academia. Special guest speakers were: D. Garceau, Director of Drug Development at BELLUS Health; V. Bartekian, President of Vantage Biotrials Inc.; C. Pavlovic Founder of BioTech Montreal.

► The Institute gave financial support to the Hydro-Québec Montreal Regional Science and Technology Fair. This sponsorship encouraged participation in science Montreal Island-wide and was held from March 18-20, 2012, at the Laval Liberty and Laval Junior High Schools.

► Institute faculty served the academic and wider community in multiple ways. All staff served on a variety of Faculty and McGill Committees, and reviewed journal articles and PhD/MSc theses. In addition, staff responded to a wide assortment of questions about parasites from the general public, students, university teachers, and the media.

Partnerships:

► In 2012, our Provincially-funded Centre for Host-Parasite Interactions completed its fourth year of a six-year cycle as a Centre of excellence in scientific research in Quebec. See www.mcgill.ca/parasitology/chpi for details of scientific activities and services offered. The Centre brings together researchers and their trainees into what is considered by external reviewers as the strongest centre for parasitological research in the world. It is recognized as an FQRNT Regroupement stratégique, and now includes 38 members.

► Prof. Beech worked in partnership with the National Council for Scientific and Technological Development in Brazil in an Internship Program which has the possibility to bring young scholars to McGill. He also obtained funding from the Conseil franco-québécois de coopération universitaire (CFQCU) for joint supervision of a Ph.D. student (Thomas Duguet) with Cédric Neveu at the Institut national de la recherche agronomique (INRA) in Tours, France.

► Prof. Prichard established a Canada/Uganda/USA partnership for the development of a vaccine against trypanosomiasis.

► Prof. Geary is a partner in a research project on discovery of novel anthelminics that target multiple receptors, funded jointly by the Bill and Melinda Gates Foundation, Grand Challenges Canada and CIHR. Partner countries are Canada, South Africa and Botswana. Prof. Geary is also the leader in the Drugs for Neglected Diseases Initiative to assess the potential of the drug flubendazole against helminth infections, such as onchocerciasis (river blindness), lymphatic filariasis (elephantiasis) and loiasis (African eye worm). The partners in this flubendazole project are McGill University, Michigan State University in the USA, Abbott Laboratories in the USA, and Bertin Pharma in France. If successful, flubendazole will contribute to worldwide efforts to control filarial infections.
► Staff at the Institute of Parasitology cooperate with other teaching units. Prof. Geary developed and delivers a course on water-borne health hazards. This illustrates the continuing commitment of the Institute of Parasitology to other Macdonal programs, such as the Brace Water Institute.

**Milestones:**

► Promotion – Prof. Marilyn Scott was promoted to Full Professor in 2012.

► New hire – As a consequence of the resignation of Assistant Professor Florence Dzierszinski in December 2011, a successful search was launched in 2012 to recruit a new Assistant Professor. Dr. Jerry Aldridge, from St. Jude Children’s Research Hospital in Memphis, Tn, USA, has accepted McGill’s offer and will join the Institute of Parasitology in 2013.

**Honors, Awards and Prizes:**

► Prof. Roger Prichard had the distinguished Honorary Degree of Docteur Honoris Causa conferred on him by the Université Paul Sabatier, Toulouse, France, in April 2012. This was in recognition of his outstanding work on the control of parasitic diseases worldwide, and also for his collaboration with colleagues from Université Paul Sabatier on the subject.

► Prof. Roger Prichard renewed his James McGill/William Dawson Chair for another 7 years. He is also a Fellow of the Australian Society for Parasitology, an Honorary Member of the European Veterinary Parasitology College, and a Fellow of the Royal Society of Tropical Medicine and Hygiene, UK.

► Prof. Timothy Geary was reappointed Director of the Institute of Parasitology, 2012-2017.

► Prof. Timothy Geary received the Bueding and von Brand Award, from the American Society of Parasitologists (ASP). He also gave the Bueding and von Brand lecture at the ASP Meeting in July 2012.

► Assistant Professor Petra Rohrbach was selected to serve as a “Research Ambassador” for DAAD, the German Academic Exchange Service, for the 2012/2013 academic year. This is to promote research opportunities in Germany. Dr. Rohrbach will be representing McGill on a professional level.

► Prof. John Dalton received the Bancroft Fellow-in-Residence Award, Queensland Institute for Medical Research, Brisbane, Australia.

► Prof. Scott served as the Director of the McGill School of the Environment during 2012.

► Doctoral student, Anne-Marie Chomat, continued to hold a prestigious FQRNT PBEEE (Programme de bourses d’excellence pour étudiants étrangers) funding award from the Quebec government.

► In 2012, Canada Research Chairs were held by Prof. J. Dalton, Tier 1 CRC in Infectious Diseases, and Prof. Geary, Tier 1 CRC in Parasitology Biotechnology

**Challenges:**

This report would not be complete without some mention of the challenges faced by the Institute of Parasitology. Since our main building has been in existence since 1932, aging infrastructure is a constant concern. Our issues revolve around maintenance of aging facilities, and the strain on equipment and space generated by the large number of students. Constraints in funding for higher education and research at the provincial and national levels also complicate our future.