McGill

Report of the
Academic Policy Committee D12-67

447th REPORT OF THE ACADEMIC POLICY COMMITTEE TO SENATE
on APC meeting held on 11th April and 2nd May 2013

I. TO BE APPROVED BY SENATE

(A) NEW TEACHING PROGRAMS REQUIRING SENATE APPROVAL (approvals of new minors and options added to existing programs and major revisions to programs are reported in Section IV.A.1.a. for information) - *none*

(B) ACADEMIC PERFORMANCE ISSUES / POLICIES / GOVERNANCE/AWARDS

Principal's Prize for Outstanding Emerging Researchers

At a meeting on 11th April 2013, the Academic Policy Committee reviewed and approved a proposal presented by the Research Advisory Council (RAC) for the creation of a Principal's Prize for Outstanding Emerging Researchers. This proposal is presented to Senate for approval as a separate item on the agenda.

(C) CREATION OF NEW UNITS / NAME CHANGES / REPORTING CHANGES (*Appendix A)*

Faculty of Medicine

Microbiome and Disease Tolerance Centre / *Centre microbiome et tolérance aux maladies*

At a meeting on 11th April 2013, the Academic Policy Committee reviewed a proposal for the creation of a research centre, the Microbiome and Disease Tolerance Centre (MDTC), on the recommendation of the Research Advisory Council which reviewed it on 9th January and 28th February 2013. The proposal builds on McGill's excellence and international recognition in the field of Infection and Immunity. It is driven by researchers based in the departments of Microbiology and Immunology, Medicine, Paediatrics, Human Genetics, the Institute of Parasitology, Université de Montréal, and McMaster University. It focuses on fundamental mechanisms that govern the interactions between microbes and the healthy human body.

APC therefore recommends that Senate approve the following resolution:

Be it resolved that Senate approve the proposed Microbiome and Disease Tolerance Centre (MDTC)/ Centre microbiome et tolérance aux maladies (CMTM) and so recommend to the Board of Governors.

(D) CHANGES IN DEGREE DESIGNATION

Faculty of Education – School of Information Studies (*Appendix B)*

Master of Library and Information Studies (M.L.I.S.) to Master of Information Studies (M.I.St.)

At a meeting on 11th April 2013, the Academic Policy Committee reviewed a proposal from the Faculty of Education to change the degree title of the Master of Library and Information Studies to Master of Information Studies. The change is in keeping with the evolution of the discipline: it reflects the evolving dynamic of the information studies field, and is inclusive of

all the cognate areas of interest in the field. Library Studies will remain an area of interest in the Master's program. The proposed change in degree title positions the program in alignment with similar moves at other Canadian Schools or Faculties of Information Studies, such as Université de Montréal, University of Ottawa, and University of Toronto. It also connects to the current name of the Ph.D. in Information Studies offered by the School.

APC therefore give notice of its recommendation that Senate approve the following resolution at a subsequent meeting:

Be it resolved that Senate approve the proposed modification to the degree title "Master of Library and Information Studies" (abbreviated to "M.L.I.S.") to "Master of Information Studies" (abbreviated to "M.I.St.") and that Article 13.1 of the University Statutes (List of degrees granted in course) be amended accordingly.

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II. TO BE ENDORSED BY SENATE / PRESENTED TO SENATE FOR DISCUSSION - *none*

III. APPROVED BY APC IN THE NAME OF SENATE

(A) DEFINITIONS – *none*

(B) STUDENT EXCHANGE PARTNERSHIPS / CONTRACTS / INTERUNIVERSITY PARTNERSHIPS - *none*

(B) OTHER - *none*

IV. FOR THE INFORMATION OF SENATE

A) APPROVAL OF COURSES AND TEACHING PROGRAMS

1. Programs

a) APC approvals (new options/concentrations and major revisions to existing programs)

i. New concentrations/options within existing programs

Faculty of Education

- M.Ed. in Educational Psychology; Non-Thesis – General Educational Psychology – Project (48, cr.)
- M.Ed. in Educational Psychology; Non-Thesis – Inclusive Education – Project (48 cr.)

At a meeting on 11th April 2013 the Academic Policy Committee reviewed and approved the proposed addition of a Research Project to the M.Ed. in Educational Psychology; Non-Thesis – General Educational Psychology and to the M.Ed. in Educational Psychology; Non-Thesis – Inclusive Education, making students eligible to receive and maintain major fellowships over four full-time semesters by retaining a full-time enrolment status. With the increased research requirements, the programs would serve as a ground for future doctoral student recruitment.

ii. Major revisions of existing programs

Faculty of Education
Master of Library and Information Studies (M.L.I.S.)

At a meeting on 11th April 2013 the Academic Policy Committee reviewed and approved the major revisions to the Master of Library and Information Studies. The change in degree designation to Master of Information Studies constituted the main portion of the revisions (please see Section I. D above). A Research Project component was added to the program, making students who follow it eligible for internal and external fellowships. The Research Project stream will also serve as a ground for future doctoral student recruitment. The Council on Graduate and Postdoctoral Studies (CGPS) approved this proposal earlier on 11th April 2013.

b) APC Subcommittee on Courses and Teaching Programs (SCTP) approvals (Summary reports: http://www.mcgill.ca/sctp/documents/)

i. Moderate and minor program revisions

Faculty of Arts
Approved by SCTP on 6th December 2012
- B.A. Social Studies of Medicine; Minor Concentration (18 cr.)

School of Continuing Studies
Approved by SCTP on 4th April 2013
- Graduate Diploma; Translation; English to French (30 cr.)
- Graduate Diploma; Translation; French to English (30 cr.)
- Graduate Diploma; Translation; Spanish to English (30 cr.)
- Graduate Diploma; Translation; Spanish to French (30 cr.)
- Certificate; Translation; English to French (30 cr.)
- Certificate; Translation; French to English (30 cr.)

Faculty of Dentistry
Approved by SCTP on 14th March 2013
- DMD (214 cr.)

Faculty of Education
Approved by SCTP on 4th April 2013
- M.Ed.; Educational Psychology; General Educational Psychology; Non-thesis (48 cr.)
- M.Ed.; Educational Psychology; Inclusive Education; Non-Thesis (48 cr.)
- M.A.; Educational Psychology; Learning Sciences; Thesis (45 cr.)
- M.Ed.; Educational Psychology; Learning Sciences; Non-Thesis (48 cr.)
- Ph.D.; Educational Psychology; Human Development
- M.A.; Educational Psychology; Human Development; Thesis (45 cr.)
- B.Ed.; Secondary Science and Technology (150 cr.)
- B.Ed.; Secondary Social Sciences; History and Citizenship, Geography (120 cr.)
- B.Ed.; Secondary Social Sciences; History, Citizenship, Ethics and Religious Culture (120 cr.)
- B.Ed.; Secondary Social Sciences; History, Citizenship, Ethics and Religious Culture (120 cr.)
- B.Ed.; Secondary Mathematics (120 cr.)
- B.Ed.; Concurrent B.Mus./B.Ed.; Music Education / Music Elementary and Secondary; Major (137 cr.)

Faculty of Engineering
Approved by SCTP on 4th April 2013
- B.Eng.; Materials Engineering; Co-op (148 cr.)

- B.Eng.; Mining Engineering; Co-op (150-152 cr.)

Faculty of Medicine
Approved by SCTP on 4th April 2013
- B.Sc. (Rehabilitation Science); Occupational Therapy; Major (90 cr.)
- B.Sc. (Rehabilitation Science); Physical Therapy; Major (90 cr.)

Faculty of Music
Approved by SCTP on 14th March 2013
- B.Mus.; Music History; Major (124 cr.)

ii. Program retirements

Faculty of Agricultural and Environmental Sciences
Approved by SCTP on 4th April 2013
- Graduate Diploma; registered Dietitian Credentialing (30 cr.)
- Diploma; Epidemiology (30 cr.)

2. Courses

a) New Courses : **8** (14th March) and **28** (4th April 2013)
Reported as having been approved by SCTP on 14th March 2013:
Faculty of Arts: 8
Reported as having been approved by SCTP on 4th April 2013:
Faculty of Agricultural and Environmental Sciences: 6
Faculty of Arts: 2
School of Continuing Studies: 2
Faculty of Education: 11
Faculty of Engineering: 2
Faculty of Medicine: 5

b) Course Revisions: **24** *(6th December 2012),* **10** *(14th March)* and **57** *(4th April 2013)*
Reported as having been approved by SCTP on 6th December 2012:
Faculty of Science: 24
Reported as having been approved by SCTP on 10th January 2013:
Faculty of Arts: 1
Reported as having been approved by SCTP on 7th February 2013:
Faculty of Arts: 1
Reported as having been approved by SCTP on 14th March 2013:
Faculty of Arts: 4
Faculty of Dentistry: 9
Reported as having been approved by SCTP on 4th April 2013:
Faculty of Agricultural and Environmental Sciences: 2
School of Continuing Studies: 4
Faculty of Education: 42
Faculty of Engineering: 5
Faculty of Medicine: 4

c) Course retirements: **4** *(14th March)* and **4** *(4th April 2013)*
Reported as having been approved by SCTP on 14th March 2013:
Faculty of Arts: 2
Faculty of Dentistry: 2
Reported as having been approved by SCTP on 4th April 2013:
Faculty of Education: 2
Faculty of Engineering: 2

(B) OTHER - *none*

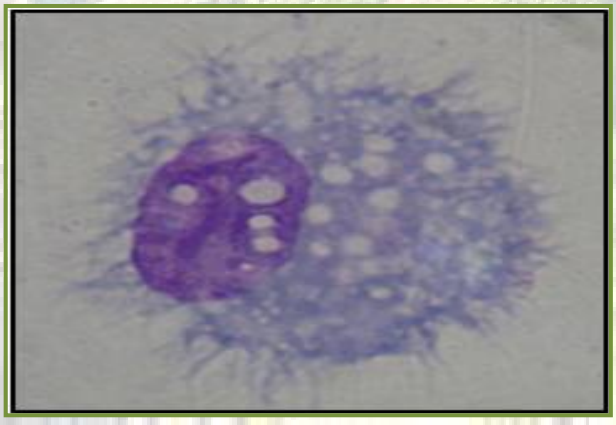
THE MICROBIOME AND DISEASE TOLERANCE CENTRE (MDTC)

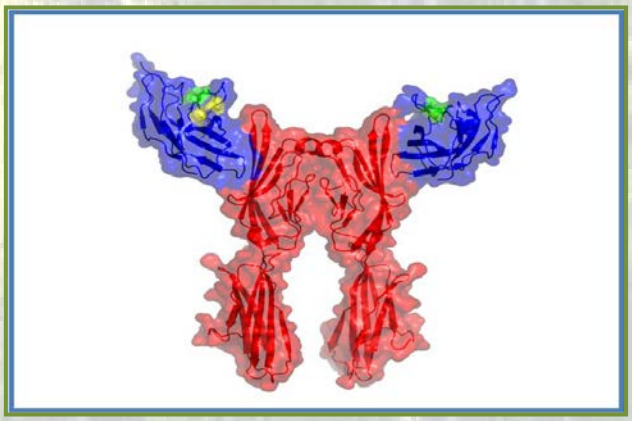
AT McGILL UNIVERSITY

Submitted by

J. Madrenas, MD, PhD, FCAHS
Professor and Chairman
Department of Microbiology and Immunology
McGill University

April 2, 2013





EXECUTIVE SUMMARY

The current proposal builds on McGill's track record of excellence and international recognition in the field of Infection and Immunity, expanding it to create and develop the Microbiome and Disease Tolerance Centre (MDTC).

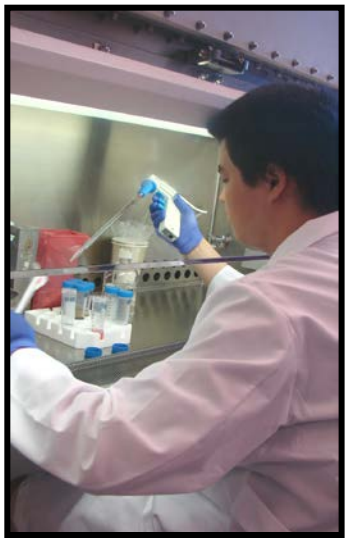
MDTC is an advanced research and education centre working in the area of human health and how the microbes normally present in our bodies, the so called commensal and long term low pathogenic microbes, can determine our immune health status and prevent or cause the development of chronic, immune-mediated inflammatory diseases.

This proposal is driven by the desire of a group of 25 investigators from 3 universities (McGill, Montréal, McMaster), based on 3 Faculties at McGill (Medicine, Science and Agricultural and Environmental Sciences) and 5 departments (Microbiology and Immunology, Medicine, Paediatrics, Human Genetics, Institute of Parasitology), to synergize their own internationally renowned research programs into an innovative health research opportunity for McGill, the province of Quebec and Canada.

HISTORY OF THE DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY AT McGILL UNIVERSITY: A TRACK RECORD OF EXCELLENCE

In 1931, a Department of Bacteriology was founded at McGill University with Dr. Everett G.D. Murray as its first Chairman. Dr. Murray arrived from Cambridge to find that he was the sole staff member of a Department whose few laboratories were not designed for bacteriological work. Dr. Murray undertook the creation of an environment to teach Medical and Science students, and introduced them to the excitement of research. Dr. Murray's work set the stage for today's extensive network of collaborations of departmental members with key leading researchers in the Montreal area and around the world. In 1965, the Department's name was changed to Microbiology and Immunology.

Over the 81-year history of the department, its members have led or been involved in fundamental discoveries that have impacted on our knowledge of Science and Medicine. These discoveries include the identification of the microbe *Listeria monocytogenes*, causal agent of listeriosis; the identification of the antiviral properties of 3TC, one of the first anti-retroviral drugs used in the treatment of AIDS; the development of imiquimod to treat cutaneous leishmaniasis; the identification of mechanisms to prevent immune-mediated diseases such as diabetes; the discovery of new ways to prevent and treat infections caused by Staphylococcus bacteria; the identification of mechanisms to prevent resistance to anti-viral drugs; and the development of new treatments for multiple sclerosis.

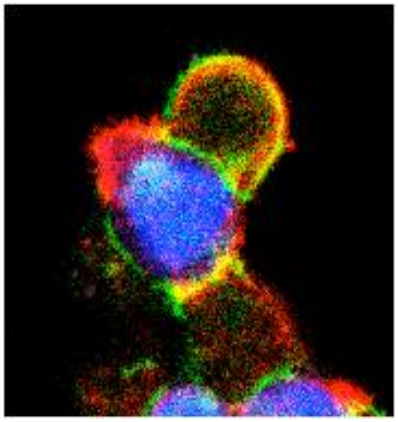


Currently the Department of Microbiology and Immunology at McGill has 20 primary members (including 6 Canada Research Chairs and 1 Dawson Professorship), over 50 associate and affiliate members, and a vibrant group of trainees (300 undergraduates, over 30 Masters students, over 45 PhD students and over 10 Post-Doctoral Fellows) and technical and administrative staff. This team has an impressive track record of significant discoveries resulting in an average of 90 publications per year in high profile journals with a cumulative yearly impact factor of 600 and an average of $15 million dollars in yearly peer-reviewed funding. For example, in the last CIHR competition, the Department of Microbiology and Immunology (leading the establishment of MDTC) had a success rate of 87% (compared to the National Average of 17%) with 7 grants awarded to members for a value of over $4.5 million plus grants that were granted to associated members of the department with ties to MDTC. These investigators and their teams lead many partnerships with local and external research teams in academic and private corporate sectors and hold executive directorships and memberships in National and International research initiatives such as the CIHR Human Immunology Network (CHIN) and the World Health Organization (WHO).

McGill University and its Faculty of Medicine are fully committed to support the growth and operation of this team as indicated by the agreement to recruit six new faculty members. Currently, three new recruits have been identified, one of them (Dr. Irah King) has arrived and started his laboratory (on September 1, 2012) and two others are in the process of relocating to Montreal (by August 2013). The three are emerging stars in Science working at the cutting edge of research in Infection and Immunity.

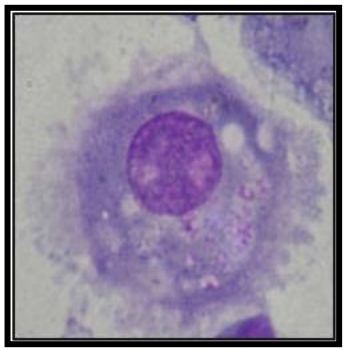
A VISION FOR THE FUTURE: THE MICROBIOME AND DISEASE TOLERANCE CENTRE

Looking to the future, members of the department are embarked in a strategic positioning of their research operation, aligned with McGill Strategic Research Plan and the 2010-13 Quebec Research and Innovation Strategy. This vision is based on the targeted allocation of human and material resources to operational, multi-disciplinary and trans-departmental research groups. The positioning of members in this way comes with the significant optimization of the limited resources currently available and avoidance of duplication. In this context, some members of the department are already physically and operationally linked to the Complex Trait Group or the Infection and Immunity Axis of the Research Institute of McGill University health Centre.



A thorough analysis of strengths and opportunities within the department has identified the broad multidisciplinary expertise of scientists currently based at the Duff as a unique opportunity to develop an operational research group working in the emerging field of commensalism and immunomodulation. This area is based on the realization

that the microbes that live in our bodies, under basal or long term low pathogenic conditions, have steady effects on the immune system and determine the development and function of this system, including the ability to prevent or cause diseases through dysfunction of the immune system.



Moving towards *functional* microbiome studies

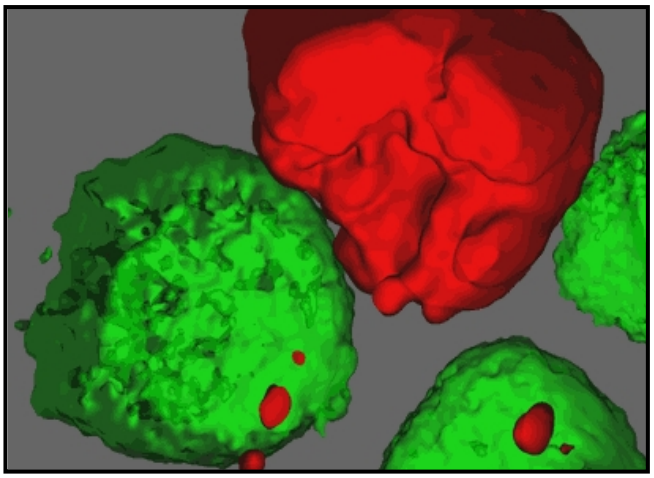
In 2008, the Human Microbiome Project (HMP) was launched to identify the microbiota present in different sites of the human body. This project has as specific aims the collection of genomes from microorganisms on the bodies of healthy and diseased individuals, as well as the development of technologies, tools and approaches for better characterization of these microbiome communities and their genomes.

The Human Microbiome Project is a high profile project, comparable in scope to the Human Genome Project, and carries with it the opportunity to access to strategic funding and resources from NIH, CIHR and European agencies. The HMP has global representation with Canadian components being operational under the CIHR umbrella led by the Institute of Infection and Immunity. Major Microbiome Centres or initiatives in Canada are based at The University of British Columbia, University of Toronto and University of Western Ontario. McGill does not currently have a sizable microbiome research group nor benefits from the HMP resources in a sizable manner, although it has researchers with individual research programs aligned with several aspects of this project (e.g. genomic analysis).

One of the research avenues that the HMP has promoted is the analysis of microbiota and its changes during disease conditions. This primarily involves the qualitative and quantitative identification of microbial species in the course of different diseases and its correlation with development, progression and response to therapy. This is particularly active in the area of inflammatory bowel disease and intestinal cancer.

A closer look at the current initiatives within Microbiome studies reveals unnecessary limitations, for example mechanistic questions are not often addressed within the specific aims of these studies. In particular, we still have no knowledge on the mechanistic basis for colonization by microbiota in a site–specific manner, or what these mechanisms involve. In addition, no analysis of the spectrum of microbial colonization at the mechanistic level has been performed, leaving the door open for analysis of commensalism and pathobiosis. In addition to the traditional microbiome, one out of 3 people in the world have intestinal helminth worm infections that should therefore be considered as part of the Microbiome for people living in the developing world. There are no major efforts to determine how helminth infections regulate autoimmune disease or other co-infections such as for example leishmaniasis. More important, this window of opportunity has two main translational implications. It will first generate the opportunity to study how these mechanisms translate in the modulation of immune responses that promote health or can lead to disease. The other implications are potentially novel templates for the development of immunotherapeutics that can range from alternatives to antibiotics to modulators of autoimmune responses and inducers of transplantation tolerance. Modulating the levels of

microbiota-derived genes (for example with antimicrobials or probiotics) to influence health is ultimately much easier than modulating host gene activities.



Tolerating disease to benefit the host

Diverse phyla from both animal and plant kingdoms have evolved mechanisms to resist as well as tolerate infectious agents. Whereas pathogen resistance prevents productive infection and has obvious benefits for host fitness and survival, the benefits of tolerance are less clear. Disease tolerance is operationally defined as the ability of the host to minimize tissue damage and dysfunction associated with infection without directly affecting the pathogen load. It is conceivable that tolerance evolved to maintain host survival following encounter with non-replicating pathogens that were too large to phagocytose (such as helminths) and/or microbes that replicated at a rate that could not be acutely controlled (bacteria). A third possibility is that tolerance to a given pathogen evolved to actually enhance host fitness. This latter point is exemplified by recent data in mice that commensal segmented filamentous bacteria in the lower intestine promote pathogenic lymphocyte differentiation and autoimmunity in isolation, but when controlled, can actually enhance host protection to non-commensal bacterial species. Another example is early epidemiological data and more recent clinical data indicating that infection with soil-dwelling helminths can prevent the onset as well as ameliorate ongoing inflammatory bowel disease in humans.

The mechanisms of disease tolerance can be diverse, ranging from genetic alterations of the host to “environmental” modifications such as pathogen sequestration, but remain largely unknown. However, it is clear that this phenomenon is an understudied area of research with great potential for exploitation as an alternative avenue to promote human health. In pursuit of identifying clinically relevant determinants of host commensalism and disease tolerance, we propose to establish the Microbiome and Disease Tolerance Centre (MDTC).

MISSION

The MDTC at McGill University is a research group that promotes and carries out advanced research and education on fundamental mechanisms that govern the interactions between microbes and the healthy human body. The MDTC will explore how these interactions maintain human health and how they help us to avoid commonly observed diseases.

VISION

The vision for MDTC is to become a leader in research and education in the area of microbial – immune interactions under healthy or low pathogenic conditions. Research by MDTC will provide answers to questions regarding our health such as: what makes microbes helpful or harmful? How can microbes in our bodies make us healthy or sick? How can we promote healthy immunity? And how can we prevent inflammatory and

immune diseases such as diabetes, multiple sclerosis or infections? In the next 10 years, if successful, MDTC will become the primary leading research group in Canada and one of the top 5 in the world for research in functional microbiome studies (what we call functional microbiomics) and the immunological mechanisms that regulate and are regulated by microbes.

SCIENTIFIC GOAL

With this window of opportunity, the goal of the research performed at MDTC is **to discover the immune mechanisms that are exploited in the interaction between commensal and low pathogenic organisms and their hosts**. Characterization of these mechanisms will provide a valuable source of tools and strategies for the development of novel immunomodulatory approaches for the prevention and treatment of inflammatory, infectious and immune mediated diseases.

MEMBERSHIP

Tackling this research requires a broad base of expertise and technology platforms, from advanced genetic technology to protein biochemistry, structural biology, small animal models and clinical medicine. The faculty of the Department of Microbiology and Immunology at the Duff fulfill this requirement, providing a unique opportunity for the establishment of this centre. The membership of MDTC currently spans 25 investigators from 3 universities (McGill, Montréal, McMaster), based on 3 Faculties at McGill (Medicine, Science and Agricultural and Environmental Sciences) and 5 departments (Microbiology and Immunology, Medicine, Paediatrics, Human Genetics, Institute of Parasitology). Two types of membership are identified: primary and associate memberships. Primary membership is define as unique of first centre affiliation and includes 12 members from molecular microbiology, virology, and immunology, and includes two clinician scientists, one of them with an active clinical program. Associate membership is granted to members from other centres with a research interest linked to MDTC, and involves another 13 members that are essential to cover the breath of biological and clinical implications of MDTC's field of study. Among these 13 associate members, there are 5 clinician scientists that are essential to fully enhance the research with human material. The associate membership pool may expand to include additional members from basic sciences and clinical departments with expressed interest to become members of the MDTC. See below specific inter-member collaborations already underway.

Primary Members:

Director: Joaquin Madrenas, MD, PhD, FCAHS, Professor and Chair of the Department of Microbiology and Immunology. He holds the Tier I Canada Research Chair in Human Immunology and is the Executive Director of the Canadian CIHR Human Immunology Network. His research program explores the cellular and molecular mechanisms by which *S. aureus*, a pathobiont, exploits innate immune mechanisms to regulate adaptive immunity and promote commensalism. Dr. Madrenas has successfully led National and International collaborative initiatives such as the establishment of the first Canadian FOCIS Centre of Excellence in Clinical Immunology and the CIHR Human Immunology Network, and brings to MDTC his leading expertise as an internationally recognized clinician

scientist working in human immunology and the use of systems biology and computational biology approaches to dissect pathobiosis by *S. aureus*.

James Coulton, PhD, Professor in the Department of Microbiology and Immunology and internationally renowned molecular microbiologist, studies membrane proteins (MPs) and their roles in cell recognition, signaling and interactions with cellular environments. Dr. Coulton's expertise and research in protein science aim to generate abundant amounts of recombinant MPs and to identify their structural biology. Solving high-resolution crystal structures of MPs provides atomic details on mechanisms of protein function and serves as templates for design of novel therapeutics.

Benoit Cousineau, PhD, Associate Professor in the Department of Microbiology and Immunology and William Dawson Scholar. Dr. Cousineau's research program focuses on the development of bacterial live vaccines using the generally recognized as safe gram-positive bacterium *Lactococcus lactis.* This innovative vaccination approach consists of engineering *L. lactis* to express protective antigens either within the bacterial cytoplasm, secreted outside or anchored to the cell wall in combination with various immunomodulators to trigger the best protective immune response. The main expertise of Dr. Cousineau is in bacteriology, molecular microbiology, molecular biology, parasitology and immunology.

Sylvie Fournier, PhD, Associate Professor in the Department of Microbiology and Immunology. Dr. Fournier's laboratory studies a unique animal model that spontaneously develops a CD8+ T lymphocyte-mediated de-myelination autoimmune response in the central nervous system. Her studies explore the mechanisms that lead to disruption of CD8+ T cell homeostasis and the development of inflammatory nervous tissue injury and how those responses are regulated. Her expertise is in neuroimmunology, transgenic and knock-out/in mouse models, flow cytometry, cell and molecular biology.

Irah King, PhD, Assistant Professor in the Department of Microbiology and Immunology. The focus of Dr. King's research is to understand the molecular mechanisms of Th2 differentiation and function in the context of intestinal helminth infection. Using cutting-edge tools such as cytokine reporter mouse strains and advanced confocal microscopy, his studies dissect how T and B cells interact in situ to understand how the immune system tolerates a primary infection that is chronic in nature in order to generate protective immunity against re-infection.

Connie Krawzcyk, PhD, combines cellular immunology and molecular biology tools to investigate the molecular mechanisms by which the nature of immune responses is determined. Her work is focused on the molecular mechanisms by which Dendritic Cells (DCs) become differentially activated in response to diverse stimuli and transmit pathogen-specific information to other components of the immune system. She is particularly interested in the ability of DCs to direct the nature T cell responses. Models used in her laboratory include manipulation of gene expression in primary DCs, DC immunization, and Listeria infection.

Herve LeMoual, PhD, Associate Professor in the Department of Microbiology and Immunology and the Faculty of Dentistry. His research focuses on the mechanisms that bacterial pathogens evolved to resist host antimicrobial peptides that are part of the innate immune system. Inhibiting these mechanisms is likely to sensitize bacterial pathogens to the antimicrobial action of these peptides. His interest in the MDTC will be to determine to what extent host antimicrobial peptides impact the microbiota composition.

Greg Marczynski, PhD, Associate Professor of Microbiology and Immunology. His research explores how bacteria regulate their proliferation in response to complex signals and focuses on novel signal trafficking with established cell cycle regulators. Dr Marczynski brings expertise in bacterial genetics, genetic engineering, bacterial physiology, molecular biology and biochemical isolation.

Greg Matlashewski, PhD, Professor, the Department of Microbiology and Immunology. His research program explores the genetic and molecular mechanisms by which *Leishmania* causes different disease pathologies. He is also conducting implementation research for the elimination of visceral leishmaniasis in Bihar India. His interest in this MDTC program will be to determine how and why chronic helminth infections influences susceptibility to visceral leishmaniasis and whether this can be exploited as a control strategy within an endemic village settings.

Martin Olivier, PhD is an Immuno-Parasitologist and Professor of Microbiology and Immunology at McGill University and the Research Institute of the McGill University Health Centre (MUHC). He is a CIHR Investigator and a Burroughs Wellcome Fund Awardee in molecular parasitology. His main interest is directed toward the study of leishmaniasis and malaria immunobiology. His research and development activities focus in particular on host-pathogen interactions and innate immune responses, as well as the generation of nano-vaccine technology and anti-inflammatory molecules.

Selena Sagan, PhD, Assistant Professor in the Department of Microbiology and Immunology. The focus of Dr. Sagan's research is to investigate the role of microRNAs at the host-pathogen interface and explore how microRNAs influence innate immune responses, disease pathogenesis and the outcomes of pathogenic infections. She brings expertise in molecular virology, RNA biology, and next generation sequencing (RNA-seq).

Donald Sheppard, MD, Associate Professor, Departments of Microbiology and Immunology and Medicine, is a Clinician Scientist whose research program focuses on elucidating the molecular mechanisms underlying the pathogenesis of invasive fungal infections, in particular those due to the opportunistic mold *Aspergillus fumigatus*. Dr Sheppard brings expertise in molecular mycology, host-pathogen interactions, animal models and translational medicine. Dr Sheppard is also section head of the clinical mycology lab at the McGill University Health Centre and the McGill Program Director of the Royal College training programs in Infectious Diseases and Medical Microbiology.

Associate members:

Jack Antel, MD, Professor of Neurology and of Microbiology and Immunology. His laboratory interest focuses on the contribution of glial cells, astrocytes and microglia, on regulating and effecting immune responses within the central nervous system (CNS). These glial cell properties are themselves subject to regulation by interaction with their microenvironment including microbial products and infiltrating immune cells; the latters' properties will reflect systemic influences including from the microbiome. An overall objective is to develop means to modulate immune responses in context of autoimmune CNS disease to favor immune tolerance and to promote repair rather than injury. With his focus on multiple sclerosis, his studies are conducted using primary human immune and neural cells and tissues.

Amit Bar-Or, MD, is a neurologist and immunologist at the Montreal Neurological Institute and hospital, where he also serves as Scientific Director of the Clinical Research Unit and Director of the Experimental Therapeutics Program. Research interests include elucidating mechanisms of immune regulation in autoimmune diseases and immune:neural interactions in health and disease, with a focus on multiple sclerosis, as well as studying mechanisms of action of novel therapeutics for immune-mediated and neurological diseases. Dr. Bar-Or leads a number of multi-center collaborative research efforts supported by the CIHR, NIH and MSSC.

John P. Dalton, PhD, Professor in Biotechnology, Institute of Parasitology, and Canada Research Chair in Infectious Diseases. The focus of Professor Dalton's research is to understand how worm parasites control the function of their hosts' immune effector cells (innate and adaptive) to set up an environment that minimizes their damage to the host and benefits their long-term survival. The molecules that parasites secrete prevent pro-inflammatory host responses and therefore have a broad potential as medical immunotherapeutic treatments for many inflammatory diseases such as Inflammatory Bowel Disease, Crohn's disease, Arthritis and Type 1 diabetes.

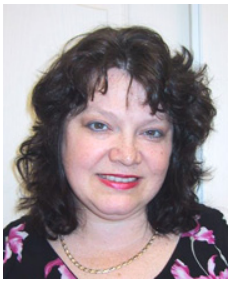
Martin Desrosiers, MD, FRCSC, Clinical Professor in Otolaryngology at the Université de Montréal, focuses on understanding the host and bacterial factors underlying the development and persistence of chronic rhinosinusitis (CRS), a chronic inflammatory disorder of the upper airways. Complex model analysis of host and bacterial genomics, gene expression, and microbiome profiling in in-vivo and ex-vivo models of CRS are used to explore the interplay between host immunity and modification of the microbiome in disease and in response to therapy. A clinical research component translates these findings into the search for biomarkers and new therapeutic approaches.

Ken Deward, PhD, is an Associate Professor in the Department of Human Genetics and has his research lab in the McGill University and Genome Quebec Innovation Centre. He has 20 years experience in genome sequencing and analysis, including Arabidopsis thaliana and human genome sequencing, and more recently, Clostridium difficile, non-human primate and intestinal microbiome genomics projects. He works closely with the Innovation Centre for the evaluation and implementation of new high-throughput DNA sequencing technologies and the development of laboratory and bioinformatics protocols. Ken's role in the MDTC will be to apply next-generation sequencing techniques to identify genes and pathways contributing to commensalism and minimizing pathogenicity.

Tim Geary, PhD, Professor and Director, Institute of Parasitology, and Tier I Canada Research Chair. One focus of Professor Geary's research is on the use of genomic, transcriptomic and proteomic techniques to identify the suite of molecules secreted by parasitic nematodes that influence host immune responses. This work is carried out in collaboration with Profs. Armando Jardim and Mary Stevenson, focusing on model parasite systems as well as human and veterinary pathogens, including the 'therapeutic' parasite Trichuris suis, which is used to treat patients with inflammatory bowel disease. Bioactive parasite proteins and non-protein molecules may have therapeutic benefit in their own right. This research is designed to advance our understanding of the molecular negotiations that underlie the host-parasite interface, resulting in establishment or resolution of infection.

Samantha Gruenheid, PhD, Associate Professor of Microbiology and Immunology and Canada Research Chair in Bacterial Pathogenesis studies interactions between bacteria and host cells within the intestine. She is currently characterizing a genetic locus that controls disease tolerance during intestinal infection. Her combined expertise in bacterial pathogenesis and host cell biology provides her the opportunity to dissect the molecular aspects of both sides of the bacteria/host interaction.

Bruce Mazer, MD, is a Professor of Medicine, William Dawson Scholar and FRSQ Chercheur Nationale (2006-2012). He is a clinician scientist studying B-lymphocyte responses in allergic airways disease, and immunoglobulin molecules as a bridge between innate and adaptive immune tolerance. Dr. Mazer has developed both murine and human cellular models to study allergic inflammation and mucosal responses to pulmonary pathogens. He is particularly interested host-pathogen and host-antigen interactions that lead to modification of glycosylation in immunoglobulin formation



Christine T McCusker, MD, is an Associate Professor of Pediatrics in the division of Allergy and Immunology and Research Director at the Meakins-Christie Laboratories of McGill University. Her research program involves understanding the development of immune tolerance to common aeroantigens and the role of bacterial and viral exposure in the development of immune response pathways in neonates. She has developed several animal models of airways disease and is currently exploring the connection between influenza infection and airways immune response to other antigens.

Ciriacco Piccirillo, PhD, Associate Professor in the Department of Microbiology and Immunology, is currently co-Leader of the Infection and Immunity Axis at the Research Institute of the McGill University Health Center, and Director of McGill's FOCIS Center of Excellence in Translational and Clinical Immunology. His research program as Canada Research Chair in *Regulatory lymphocytes of the Immune System* focuses on molecular aspects of the regulation of immune responses mediated by $Foxp3^+$ regulatory T (Treg) cells, and their dynamics in autoimmunity, infections, and mucosal immunity. His interest in the MDTC program will be to determine if and how Treg cell "defects" impact the pathophysiology of autoimmune and infectious diseases. His research program also strives to develop novel immunotherapeutic strategies to manipulate $Foxp3^+$ Treg cell function in autoimmune and chronic inflammatory diseases.

Petra Rohrbach, PhD, Assistant Professor in the Institute of Parasitology. The focus of Dr. Rohrbach's research is to understand the cellular and molecular mechanisms of drug resistance and ion homeostasis in the human malaria parasite *Plasmodium falciparum*. Her work also focuses on understanding how the parasite alters the structure and physiology of the host red blood cell that contributes to the natural resistance of malaria in endemic regions. Dr. Rohrbach's main expertise is in live cell imaging techniques, physiology of apicomplexan parasites

Mary M. Stevenson, PhD, Professor of Medicine and Associate Member of the Institute of Parasitology, is investigating the immunology and pathogenesis of blood-stage malaria with the goal of devising novel strategies for vaccine development against *Plasmodium* parasites and for treatment of severe pathology especially severe malarial anemia. In collaboration with Dr. Philippe Gros, we are identifying novel genes and pathways that control host susceptibility to malaria in mice. To investigate the effects of a concurrent gastrointestinal (GI) nematode infection on immunity to malaria and the efficacy of anti-malaria vaccines, we established a model of GI nematode-malaria co-infection and demonstrated the potent immunomodulatory effects of molecules secreted by a nematode parasite. Together with Professors Timothy Geary and Armando Jardim, we are identifying and characterizing proteins secreted by a GI nematode parasite as well as by human and veterinary pathogens and developing inflammatory disease models to test the therapeutic potential of these molecules.

Michael Surette, PhD, Professor and Canada Research Chair in Interdisciplinary Microbiome Research, Department of Medicine, McMaster University. The focus of Dr. Surette's research is on the human microbiome in health and disease and polymicrobial infections. The lab examines the nature of microbe-microbe and microbe-host interactions using biochemical, genetic and molecular biology approaches. His research program also examines the composition of the human microbiome and airway infections using metagenomics and culture based approaches.

Trainee membership:

MDTC will have an important impact in the education mission of McGill University. Through its members, graduate and undergraduate students as well as postdoctoral fellows will be active participants in the activities of the Centre. Current trainees of MDTC members include over 100 graduate students and 25 post-doctoral fellows. In addition, undergraduate programs under the direct supervision of MDTC members or in which members are involved reach over 300 undergraduate students on a yearly basis. Based on these numbers, it is clear that MDTC will have education as an important part of its mandate and will make of it a strategic priority in terms of activities and positioning at the national and international levels.

It is expected that the membership, particularly primary membership, will expand as research in microbiome and disease tolerance emerges as a key research area. Expansion will involve not only members of the Department of Microbiology and Immunology at McGill but also members from other departments that develop research programs aligned with the research mission of the centre. The membership categories, including visiting scientists and different trainee status (graduate students, postdocs, etc.), will be ultimately adopted from the McGill guidelines for Academic Centres that are currently under review.

To ensure that the education mission of the Centre takes place at all these levels, the centre will hire an education specialist to become Director of Education and Community Outreach. This position involves a person with a PhD in Microbiology and Immunology with formal postdoctoral training in Science and Medical Education. This person will be responsible for the development and implementation of innovative undergraduate and graduate educations activities that promote cutting research within MDTC. This person will use the Department of Microbiology and Immunology teaching program as the framework in which these programs will be implemented. That person has been identified: is a former graduate of our department: Dr. Claire Trottier, who is at the last stages of postdoctoral training within the Centre for Medical Education and the Research Institute of the MUHC.

EXAMPLES OF ONGOING COLLABORATIONS BETWEEN MDTC MEMBERS

- Drs. Antel/Bar-Or/Fournier are working on various aspects of neuroinflammation and share their expertise since 2003 through the CIHR Training Program in Neuroinflammation that provides an interdisciplinary platform for trainees and researchers to exchange innovative ideas, share findings, and foster collaborations.
- Drs. Cousineau/Desrosiers/Madrenas/Surette are characterizing the mechanisms that promote commensalism by pathobionts, leading to disease tolerance and enhanced immune health. They are currently working on the identification of novel molecules on the cell wall of community-isolates of *S. aureus* with selective capacity to induce strong IL-10 immune modulatory responses. Different aspects of this work were featured in the magazine *The Economist* (June 13/2009 issue), attracting international attention.
- Drs. Cousineau/Fournier/Olivier are studying the innate inflammatory responses induced by the Gram-positive bacterium *Lactococcus lactis*. The gene expression profiles of chemokines induced by this bacterial strain used as live vaccine are examined in macrophages *in vitro* and in cells recruited into murine air-pouches *in vivo*. In addition, they study the effect of co-incubating *L. lactis* with dendritic cells (DCs) generated from mice bone marrow. They demonstrated that *L. lactis* exhibits proinflammatory effects, which indicates a capacity for adjuvanticity by this bacterium.
- Drs. Cousineau/Matlashewski/Olivier are engineering and evaluating bacterial live vaccines against the human parasite *Leishmania*. Strains of the Gram-positive bacterium *Lactococcus lactis* are engineered to express various *Leishmania*-specific antigens in the cytoplasm, secreted or anchored to the bacterial cell wall. *L. lactis* strains co-expressing murine IL-12 along with the various antigens are also evaluated as live vaccines administered either subcutaneously or orally. They demonstrated that *L. lactis* live

vaccines induce significant protection against both cutaneous (*L. major*) and visceral leishmaniasis (*L. donovani*) in mice models of infection.

- Drs. Geary/King have a mutual interest in how intestinal helminth infection modulates the immune response. The establishment of the MDTC will provide an important platform for frequent discussions and opportunities for collaboration.
- Drs. Gruenheid/LeMoual synergize their expertise to answer significant questions about the relevance of inhibiting bacterial resistance to antimicrobial peptides.
- Drs. Gruenheid/King have initiated a new collaboration to compare and contrast the intestinal response to colonization with Gram-negative bacteria vs. helminths. Their work relates to mechanisms of microbial and macrobial tolerance within the intestine.
- Drs. Madrenas/Marczynski have started collaborations stemming from new insights gained from the model bacterium *Caulobacter crescentus* (studied in the Marczynski lab) such as its novel lipopolysaccharide (LPS) that, unlike most bacterial LPS, is reported to be low or non-inflammatory, and a novel protein kinase overlapping its chromosome origin of replication present in human commensals and pathogens, factors that may contribute to the balance between commensalism and pathogenicity.

These specific collaborations will be excellent seeds to establish a solid platform on which to build a coordinated, multi-disciplinary, trans-departmental research program.

MDTC ACTIVITIES

The operation of MDTC will combine traditional academic activities with innovative approaches to research and education. These will include data seminars presented by faculty members and trainees and journal clubs. We will partner with the Department of Microbiology and Immunology and MUHC to support the Infection and Immunity Seminar Series that currently runs on a biweekly basis during the academic year, inviting internationally renown scientists and attracting consistently between 50 and 100 people (it is expected that this number will further increase as a result of participation of MDTC members).

We will also implement technical and training workshops for the McGill community and local/regional community on technical aspects of research operation, e.g., advanced flow cytometry and cell sorting capabilities, novel quantitative imaging technologies, systems biology platform. MDTC will play not only an active role in delivery but also a coordinating leading role with other centres and units at McGill interested in these initiatives. These activities will help us to address the needs for highly qualified personnel in the sector of biotechnology and health research.

An important aspect of the science developed at MDTC is clinical translation. To ensure this, we will engage clinical partners through basic-clinical seminars to establish active scientific collaborations. We hope that this will translate in increased number of residents

and fellows spending time in properly recognized stages in science laboratories, ultimately resulting in increasing numbers of clinician scientists at McGill.

Together, we will collate the training programs in members' laboratories and in clinical partners in an innovative, forefront training program plan for the field of Human Microbiome and Disease Tolerance studies that should be submitted in upcoming training program grant competitions from CIHR and other organizations.
To project MDTC internationally, we will embark in the organization and delivery of an International Symposium on Functional Microbiome Studies. This symposium should attract international leaders in the field as well as those consortia working in the different aspects of Human Microbiome studies.

As part of MDTC projection, we will develop an interactive webpage for the Centre. This webpage will provide timely information on ongoing MDTC research, opportunities for collaboration, and ground breaking developments on the field of functional Microbiome studies and disease tolerance. This webpage will also serve as a portal to the core facilities and services supported by and aligned with MDTC research mission.

Members of MDTC will also be actively involved in community outreach, and contributing to fundraising, alumni recognition events and donor appreciation events.

A budget section for the operation of MDTC is provided in Appendix I to this document.

CURRENTLY AVAILABLE CENTRE INFRASTRUCTURE

- Basic research glassware washing, autoclaving and central store/biobar services provided by departmental technician.
- Extensive core common equipment including centrifuges, real time PCR machines, imaging units and dark room.
- Flow cytometry and cell sorting facility: Currently, it is the consolidated site with the most extensive flow cytometry analysis units on McGill Campus. Addition of a cell sorter (through Dr. Madrenas CFI-CRC) ensures that this facility becomes the largest flow cytometry and cell sorting facility on campus.
- Animal colony: key asset for investigators at the Duff providing housing facilities for rodent studies including infectious models.
- Basic confocal microscopy.
- Deep sequencing: currently there is one unit used by one of the investigators for viral studies. The expertise gathered with the use of this unit may play a key role in subsequent use of this technology for other types of studies.
- Association with the Sheldon Biotechnology Centre provides access to selective advanced structural biology equipment such as a Biacore surface plasmon resonance, peptide synthesis and multiplex units.

GOVERNANCE

Dr. J. (Quim) Madrenas will be the first Director of MDTC, subject to the approval of the Dean of the Faculty of Medicine. His term will be for three years renewable. An Associate

Director for the centre will be selected by the Director. Following the initial three-year term, subsequent Directors and Associate Directors of the Centre will be elected by a Governing Council, and will be appointed subject to the approval of the Dean.

Membership at the MDTC will be based on prospective members' active research program in line with the mission of the centre. Membership requires external peer-reviewed funding and active commitment to excellence in research in one or more of the themes covered within MDTC. Membership within the MDTC will be approved by 2/3 of the current primary members of MDTC and confirmed by the Governing Council, and will be held initially for 5 years. Membership will be renewable thereafter, subject to satisfactory performance review by the Governing Council.

Additional details about the process of selection of Director and members will be incorporated once the current blueprint document for Centres at McGill is completed and approved by governing council.

In addition, MDTC will have a Director of Operations who will lead the administrative and financial operation of the Centre, and supervise the administrative personnel working at the Centre. Such a position has a candidate identified (Ms. Petra Gaiser), currently Administrative Officer for the Department of Microbiology and Immunology. This position will evolve in parallel with similar positions at other research Centres at McGill.

GOVERNING COUNCIL AND INTERNATIONAL ADVISORY BOARD

The MDTC will have a Governing Council, chaired by the Vice-Principal (Research and International Relations) or her delegate along with the Dean of Medicine or his delegate as assistant chair. The membership of this Council will include the Director and Associate Director of the MDTC, chairs or their representatives from the departments represented in the membership of the MDTC and one representative from primary members and one from associate members. This Council is expected to provide input into the operation of MDTC regarding issues of space allocation, equipment, multi-investigator grant initiatives and other institutional opportunities. Term of membership of this Council will be 3 years. Membership and terms of reference for this council will be ultimately aligned with the blueprint document from McGill once available. This includes the accommodation of any additional members based on future partnerships.

The Governing Council will also be responsible for the annual approval of the Centre's budget. This will be forwarded annually to the Associate Dean of Research for approval.

In addition, MDTC will have an International Advisory Board (IAB) that will provide scientific and strategic advice to the Centre. This Board will include scientific leaders in the areas represented in the operation of MDTC. In the early stages of MDTC, the IAB will have three members only to minimize costs and maximize direct involvement. These members will be international leaders in the areas of Microbiome studies, Human Imunology and Clinical Research. Members of this board will be chosen by the Governing Council and will meet at least once every two years.

STRATEGIC FIT

Despite the optimism of Nobel laureate Dr. F. MacFarlane Burnett in 1953, reiterated by the Surgeon-General of the USA in 1978, that infectious diseases would be controllable, these diseases continue to be a major source of morbidity and mortality and a social problem at the global scale. As illustrated by recent events (Listeria and Cholera outbreaks, HIV-AIDS, SARS, etc.), social high mobility and interactivity has resulted in the emergence of novel infectious diseases and the re-emergence of diseases that were rare in the Western world. This threat is compounded by increasing evidence that infectious diseases may be triggers of chronic immune-mediated diseases resulting from early inflammatory tissue injury. The resulting immune-mediated diseases, including diabetes and atherosclerosis, are major causes of disability and death, and have a tremendous worldwide economic impact in the range of tens of billions of dollars/year. Addressing this threat is the overarching target of research at the MDTC.

Of the four areas of intervention identified in the 2010-13 Quebec Research and Innovation Strategy, three are directly addressed by the establishment of MDTC. These are the need for more competitive research recognized internationally, the need for a more creative, enterprising population and the support for major developmental projects. MDTC plans to development intrinsically linked advanced research with advanced training of highly qualified personnel (HQP) as part of its mandate, through partnerships with academic world leaders as well as corporate partners and biotechnology sector, together leading to generations and retention of a highly qualified new generation of workers.

The Canadian Institutes of Health Research and the Institute of Infection and Immunity have identified Inflammation and Tissue Injury, and Preparedness for Emerging Threats as priorities. Human Immunology and the Microbiome Projects are defined as the "next frontiers" in the field of Infection and Immunity by different international organizations and opinion leaders and this supports the relevance and timeliness of this proposal.

Within McGill, timeliness for MDTC is unique because of the relocation plans of several major units (Royal Victoria, MNI, MUHC) providing a "lifetime" opportunity not only for building renovations but also for the establishment of new visionary, multidisciplinary and translational research initiatives.

Finally, by establishing MDTC, McGill is taking a big step to become a National and International leader in Infection and Immunity at the forefront of research on the interface between microbiota and the human immune system.

THE PHYSICAL ENVIRONMENT: A CHALLENGE AND AN OPPORTUNITY

The Lyman Duff Building was built in 1923 and only underwent significant structural renovations in 1949 and the mid 1960s. Since 1971, renovations or upgrades limited to specific areas of the building have been done through CFI and Quebec funding. The building currently houses three departments (Microbiology and Immunology, Biomedical Engineering, Pathology) and a clinical division (Nephrology), and includes both wet and dry research, teaching and administrative facilities.

As a result of the passage of time, the building presents significant major challenges in terms of operation, with compounding costs in terms of upkeep and repairs. For example, the state of the building severely limits our possibility to increase the undergraduate and graduate programs. This is not only due to physical constraints (the layout of the rooms not allowing for multi-functional, team-based teaching approaches) but also to financial obstacles (increasing costs associated with the number of assistants required for proper supervision of students in an outdated laboratory layout). Consequently, the building has been identified as the top priority for space renovation at McGill. This has translated into the establishment of a building redevelopment committee led by McGill Central Administration (Professor Jim Nicell), the selection of architectural (Briere, Gilbert & Associés) and engineering (PageauMorel) firms to do a functional and technical programming of the building redevelopment and the assessment of this report and development of an implementation strategy.

The Duff Medical Building is the logical site to establish MDTC as an essential node of what could become a McGill Infection & Immunity network. It houses the critical mass of the Department of Microbiology and Immunology and previous infrastructure investments. In addition, association with the Department of Microbiology and Immunology provides an administrative base to coordinate research and teaching activities of MDTC members and partners. Lastly, it facilitates fundraising through links to the illustrious history of discoveries in Infection and Immunity.

With this in mind, the availability of the functional and technical programming from the team of architects and engineers, expected to be completed by early 2013, will allow us to approach provincial and federal funding agencies and philanthropic organizations to secure the required funds for a fully redeveloped building.

The redeveloped Duff Building will become a landmark within McGill campus for an advanced research and education building. In this redeveloped Duff, training of undergraduate and graduate students and postdocs will be performed following innovative educational approaches that promote **hands-on, problem solving, and**

comprehensive – from fundamental discovery to translational application – of funded research.

POTENTIAL BENEFITS

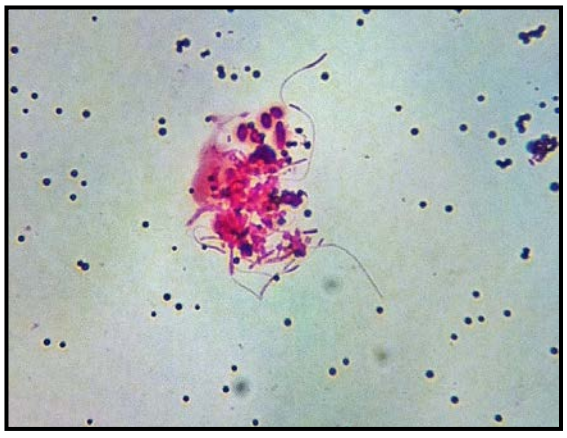
The discoveries made with the availability of MDTC will translate into improvements in the prevention and clinical management of infectious diseases by revealing novel mechanisms that promote commensalism and by identifying novel molecules that can serve as templates to develop new therapies as alternative to conventional antibiotics or for chronic inflammatory, immune-mediated diseases. The impact of this translational potential in reducing health care costs is very significant considering the health burdens of some of the diseases studied by members of MDTC (estimated at over $6 to 9 billion/yr in North America alone for several of them). To realize this potential, MDTC will promote the exploration of translational aspects of its research and foster the ongoing and future partnerships with public policy developers and with the corporate sector. Initiation of a translational path to intellectual property protection and technology transfer will be developed within the first year of MDTC. The first products completely resulting from MDTC infrastructure should be ready for licensing within 4 yr of establishment.

In addition to knowledge translation, there will be a net gain for the Quebec and Canadian economies by the establishment of MDTC and its core facilities for several reasons:

1. MDTC membership combines senior investigators with mid-career and junior investigators that are emerging stars, with stellar track records of publication in high profile journals, and with significant peer reviewed funding from National and International agencies and corporate sources (totaling in excess of $15 million/yr). The impact of these contributions to the local economy is substantial (indirect costs, employment, technology development and transfer, global visibility, etc.);

2. MDTC will provide a unique innovative environment for training in novel technologies that will become standard in the medical and pharmacological sectors in the next 5-10 years. For example, availability of the advanced flow cytometry and cell sorting facility recently established at the Duff through contributions of the CRC and CFI programs will position us as leaders in this training process and in contributions to a knowledge-based economy. Estimates of training output resulting from MDTC research, based on past track record of the members, range between 100 and 250 advanced students and fellows for the next 5 years; and

3. MDTC members have expertise in technology transfer as co-founding scientists of start-up companies or research initiatives leading to job creation.



WHY NOW

This proposal is timely and innovative as illustrated by the recent emergence of international initiatives to characterize the human microbiome (NIH, European Union), to

study Human Immunology (NIH, FOCIS) and to develop novel immune therapies based on microbial-host interactions (Gates Foundation). With the establishment of MDTC, McGill will play a leadership role in these initiatives by i) characterizing regulatory mechanisms of microbial virulence of microbes at specific sites of the human body and under conditions of commensalism; ii) by focusing on the human immune system and human immune physiology; and iii) by using the discovered mechanisms as templates for therapeutic development. Because these three combined features, MDTC will provide a unique environment fostering transdisciplinary and translational research interactions and collaborations expanding from fundamental biology and biochemistry to microbiology, immunology and clinical medicine, by providing cost-recovery access to cutting edge technology cores for molecular and cellular studies of immunity, and by promoting the expeditious translation of these discoveries to experimental animal models and ultimately to clinic.

COMPLEMENTARITY, UNIQUENESS, AND INTERACTIONS WITH OTHER CENTRES AT McGILL

McGill has built an outstanding network of research groups in Microbiology and Immunology. This network includes colleagues at the Bellini Life Sciences Complex, at other departments of McGill's Faculty of Medicine and other faculties (Institute of Parasitology at the MacDonald campus), at the Genome Quebec Innovation Center, at the MUHC (Centre Of Host Resistance), at the MNI and at the Meakins-Christie Laboratory. These groups have excelled in particular aspects that complement the current proposal. MDTC is clearly distinct from these centres. Specifically, the Complex Trait Group at the Bellini focuses on the genetic dissection of susceptibility to infection. The Respiratory group at the Meakins-Christie Labs and the different immunology groups at the MUHC are centered on aspects of mechanisms of infectivity and different regulatory mechanisms of systemic autoimmunity and allergic diseases. The Centre for the Study of Host Resistance has indicated a specific interest in tuberculosis and is currently redefined as the TB Centre. Groups at the MNI are focused on pathogenesis of neuroinflammation and neurological autoimmunity. Finally, the Centre for Host-Parasite interactions, based at the Institute of Parasitology, is focused on parasitic diseases. Although broadly speaking, all these groups are working in the area of Infection and Immunity, they have very different focus and mandate. Furthermore, unique for MDTC is its focus on mechanisms that promote **human** immune **health** by commensal bacteria at specific sites, i.e. specific microbiotas in the human body.

MDTC builds on McGill's excellence in the field of Infection and Immunity and, more importantly, fills a unique niche and complements it by focusing on the area of Microbiome-Human Immune interactions and their effect on human health. MDTC will be a setting for advanced research on functional dissection of the mechanisms that determine commensalism vs. pathogenicity by bacteria, viruses and parasites and their operation at the interface with the human immune system. All of the above mentioned groups will benefit of MDTC because of the resulting core facilities that will expand the range of opportunities of their discoveries into additional areas of preventive and personalized medicine, as determined by the unique microbiota of each individual. Through clinical partnership, MDTC will explore the consequences of microbiota manipulation as

immunotherapeutic strategy and how this translates into immunity at the individual level as well as at the population level ("herd immunity").

MDTC will strive to become a Canadian leader in the Microbiome and Human Immunology initiatives and be a forefront global player with the NIH and the European Union. Currently, Canadian participation in the Microbiome project is limited to the Universities of British Columbia and Toronto but their focus is on particular cohorts of patients rather than broad immunotherapeutic development.

MDTC will proactively interact and collaborate with the other centres at McGill in specific areas of common interest. Together we can optimize resources and delivery. For example, conversations with our clinical colleagues at MUHC on potential reagents and tool developments with clinical interest are currently taking place (e.g. Dr. Brian Ward, Dr. Marcel Behr) and it is expected that they will just be the beginning of an intense information sharing and research synergy.

With regards to Human Immunology initiative, MDTC will play a leadership role building on the FOCIS Centre of Excellence in Human Immunology at McGill and the CIHR Human Immunology Network led by the chair of the Department of Microbiology and Immunology.

CONCLUSION

In summary, the current influx of resources from the Faculty of Medicine into research on Infection and Immunity has generated momentum that attracts academic and corporate colleagues from Canada and abroad. Building on this momentum and on the experience of MDTC members, the establishment and support of this proposal is not only timely, it is an investment in innovative research that will concretely benefit Quebec, Canada, and the rest of the world.

APPENDIX I

PROPOSED ANNUAL BUDGET

Current funding

The MDTC members currently bring in excess of $15 million in peer reviewed funding distribute din a total of 75 grants. This funding includes grants from the most stringent sources such as Canada Foundation for Innovation (CFI), Canadian Institutes of Health Research (CIHR), Natural Sciences and Engineering Research Council (NSERC), USA National Institutes of Health (NIH), *Fonds de la recherche de Québec – Santé* (FRQ-S), and multiple health charities and organizations from Canada and abroad.

Proposed Income Streams

To provide for operational funding of MDTC we will embark in an aggressive campaign to applications for federal and provincial peer review funding as well as local and regional fundraising. These initiatives will include:

- Strategic applications to CIHR within the programs of emerging teams for patient-centered research programs (e.g. inflammation and chronic disease), training program, and knowledge mobilization. Specifically, we have submitted letters of intent to the NCE-knowledge mobilization program (as part of the Canadian Human Immunology Network) and the RFA in inflammation and chronic diseases (led by MDTC itself). These programs can provide $ on the range of $400,000 and $250,000 per year. In addition, we are considering the submission of a Notice of Intent to the SPOR (patient-centered research) program from CIHR.

- Application for *réseau* status to the *Fonds de la recherche de Québec – Sante*.

- We have started an aggressive partnership program with corporations. With the help of the McGill University Business Engagement Centre (MUBEC), we have been in conversations with three different companies (IntelGenx, Abbvie, Microharma), and we are proceeding with the establishment of umbrella agreements that should provide direct funding to MDTC members as well as indirect costs , part of which will revert to the centre.

- User fees from the opening of core facilities used by members as well as scientists from McGill and other universities as well as from corporations.

- Through the McGill's Development and Alumni Relations, we will also approach philanthropic organizations for consideration of donations to support MDTC. MDTC us actively working in collecting and submitted promotional material to that end.

- Additional revenues on the longer horizon may include royalties from licensed technologies and services provided as a result of development of MDTC discoveries.

- Ongoing funding initiatives being pursued by MDTC include a Letter of Intent submitted to the Network of Centres of Excellence Knowledge Mobilization Program to sustain the Canadian Human Immunology Network currently directed and led by J. Madrenas.

- The position of Education Specialist is currently being funded by a tri-partite agreement between the McGill Centre for Medical Education, the SALTISE program funded by the Quebec Government, and a private donor through the Faculty of Science. Within 3 years, we expect to obtain philanthropic donations that will cover 50% of the salary of this person, the other 50% coming from new educational (diploma) programs and activities organized by MDTC.

- Last, some of the administrative expenses are being absorbed by the Department of Microbiology and Immunology infrastructure funding (webpage, etc.) given the primary membership to this department of most of the members.

Expected Short-Term Annual Expenses

Research Activities

- Stipend Director of Operations: $ 10,000
- Director of Education and Community Outreach: (+ 24% benefits) $ 84,000
- 5 Post-doctoral fellowship awards on a 50:50 matching: $100,000
- Core facilities maintenance and support: $ 30,000
- Trainee Travel Awards Award Program: $ 20,000

Educational and Training activities

- Education Budget for redesigning of courses: $ 35,000
- Seminar Series Contribution: $ 30,000

Administrative Support

- Three administrative assistants (calculated at 0.25FT/primary member): $ 96,000
- Web design and implementation: $ 5,000

TOTAL Anticipated Annual Budget: $410,000

McGILL UNIVERSITY **SENATE**

McGill **Memorandum**

Office of the Provost
James Administration Building

TO:	Senate
FROM:	Anthony C. Masi, Chair of the Academic Policy Committee
SUBJECT:	Notice of Motion to amend University Statutes
DATE:	10th May 2013
DOCUMENT #:	***D12-67 APPENDIX B***
FOR:	☐ **DECISION** ☒ **APPROVAL** ☐ **DISCUSSION**

ISSUE: Change in degree designations

Master of Library and Information Studies (M.L.I.S.)

to:

Master of Information Studies (M.I.St.)

BACKGROUND: The Academic Policy Committee, at a meeting on 11th April 2013, approved major revisions to the Master of Library and Information Studies, which included a change in the degree designation to "Master of Information Studies". The change is in keeping with the evolution of the discipline; it reflects the evolving dynamic of the information studies field, and is inclusive of all the cognate areas of interest in the field. It also is in alignment with the name of the School that offers this professional master's program and the Ph.D. in Information Studies

MOTION OR RESOLUTION FOR APPROVAL: The old degree designation requires deletion from the *Statutes* and the new degree designation requires addition to the *Statutes*.

In accordance with Article 15.1 of the University *Statutes*, I hereby submit the following motion to amend the *Statutes*:

Be it resolved that Senate recommends to the Board of Governors that Article 13.1 of the Statutes *be amended as indicated below:*

13.1 The following are the degrees granted by the University in course:

Master of Education	*M.Ed.*
Master of Engineering	*M.Eng.*
Master of Laws	*LL.M.*
~~*Master of Library and Information Studies*~~	~~*M.L.I.S.*~~
Master of Information Studies	*M.I.St.*
Master of Management	*M.M.*
Master of Music	*M.Mus.*
Master of Sacred Theology	*S.T.M.*

RATIONALE:	Amendment of the University Statutes is necessary for McGill University to be allowed to confer the said new degree.
PRIOR CONSULTATION and APPROVAL	*Approval:* School of Information Studies Curriculum Committee Faculty of Education Academic Policy Committee APC Subcommittee on Courses and Teaching Programs (SCTP) Council of Graduate and Postdoctoral Studies (CGPS) Academic Policy Committee (APC)
NEXT STEPS:	Motion to Senate Motion from Senate to the Board of Governors.
APPENDICES:	None