

**Annual Report**  
**Division of Infectious Diseases and Diagnostic Microbiology**  
**Department of Medicine and Laboratory Medicine**  
**Jewish General Hospital**  
**January 1 - December 31, 2013**

**Introduction:**

Infectious diseases remain a major cause of mortality and morbidity worldwide. While often preventable and treatable diseases, we have witnessed the emergence of new infections, such as SARS, the reemergence of old foes such as measles and the return of more virulent and resistant forms of known pathogens, such as the superbugs MRSA, *Clostridium difficile* (*C. difficile*) and carbapenemase resistant organisms (CRO). The emergence and reemergence of these pathogens has been greatly facilitated by increasing population migration, global conflicts and rapid air travel. These factors have contributed to the increasing burden of HIV, TB, malaria, dengue, chronic hepatitis, multidrug resistant organisms and other infections found in the diverse population served by the JGH.

The JGH Infectious Diseases and Microbiology unit has been very successful in 2013 in obtaining peer reviewed research funding. The areas of primary research interests: 1. Emerging infections and multidrug resistant bacteria or “super-bugs” (e.g. MRSA, CRO), and especially *C. difficile* infection, 2. Infection prevention and control of hospital acquired infections, 3. HIV immune responses and vaccinology 4. Refugee and immigrant health, 4. Vaccine-preventable diseases and new vaccines (e.g. hepatitis B virus, varicella-zoster virus, *C. difficile* and others) 5. Management and prevention of tuberculosis, and 6. Evaluation of novel antibiotics and immune system modifiers for the treatment of infectious diseases.

**1. Research, Publications and Presentations:**

Members of the division continue to perform leading edge research in their fields chosen fields. Dr. Greenaway continues her high profile research activities on health issues of migrants as well as in vaccinology. She obtained two grants from CIHR in 2013: One as PI of a study entitled “*The Childhood Varicella Vaccination Program: Will it Protect or Harm the Immigrant Population?*”, the other as Co-PI with Dr. Rick Glazier, Cecile Rousseau and Anneke Rouemens for a project to measure the health outcomes resulting from the cuts to this the refugee health (IFH) program “*Accessibility and costs of healthcare for refugee claimants following changes to the Interim Federal Health Program*”. Dr. Greenaway published 6 manuscripts in peer-reviewed journals on the spectrum of health issues in migrants, the burden of hepatitis B and varicella in immigrants and language barriers in migrants accessing health care. She wrote a chapter in the Canadian Tuberculosis Standards (7th ed.) on “*Tuberculosis Surveillance and Screening in high-risk populations.*” She presented on “*Controversies in Migrant Health*” in a meet the Experts session at 53<sup>rd</sup> Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) in Denver, Colorado and on “*TB Screening in Migrants*” at the International Union against Tuberculosis and Lung Disease (IUATLD) World Lung Conference in Paris, France.

In 2013 Dr. Zaharatos was awarded an LDI Clinical Research Pilot Project (CliPP) grant to carry out research on immune senescence in HIV-infected persons. In 2013, he co-authored a book chapter in Sande's HIV/AIDS Medicine, entitled “*Development and transmission of HIV drug resistance*” as well as a review article in Annals of Medicine entitled “*Update on rilpivirine: a new potent non-nucleoside reverse transcriptase inhibitor (NNRTI) of HIV replication*”. Dr. Zaharatos continues as

a member of the Botswana Canada AIDS Vaccine Discovery Partnership (BCAVDP), led by Dr. Mark Wainberg of the McGill AIDS Centre and Lady Davis Institute (LDI) and Dr. Rosemary Musonda of the Botswana Harvard Partnership. His participation was key in the BCAVDP receiving a 2.47 million dollar team grant in HIV/AIDS Vaccine Discovery and Social Research, awarded in December of 2011 by the Canadian Institutes of Health Research and the Canadian HIV Vaccine Initiative. The research project was initiated in July 2012 -2015 and brings together investigators from Canada, Botswana, the Netherlands and the United States. Dr. Zaharatos is a BCAVDP co-investigator working on HIV-1 envelope immunogenicity and vaccine design. Dr. Zaharatos' laboratory's research interests include HIV immunity and vaccinology, with a particular focus on the development of gene-based vaccines and adjuvants. Dr. Zaharatos continues to be a co-investigator in other clinical studies conducted at the JGH by our division

Dr. Longtin received an FRSQ Chercheur-Boursier Junior 1 salary award as well as an operating grant from the FRSQ « *Les infections nosocomiales: Une approche globale et intégrative pour mieux comprendre et prévenir la diarrhée associée au C. difficile et améliorer l'hygiène des mains* ». Dr. Longtin also continued as the sole Infectious Diseases physician in the Pan Canadian CIHR funded "*Prevention of Arrhythmia Device Infection Trial (PADIT)*" Since his arrival he has initiated a number of projects in Infection Prevention and Control. He published 4 manuscripts in highly respected journals.

High profile research in the field of *C. difficile* infections continued. The *C. difficile* genomics research by Drs. Oughton and Dascal, in collaboration with and funded by the Institut national de santé publique du Québec, (INSPQ) may lead to a better understanding of the epidemiology of Quebec *C. difficile* strains. This is an extension of their previous work that led to two New England Journal of Medicine articles in 2005 and 2011. With the arrival of Dr. Longtin in the spring of 2014 a number of research projects related to *C. difficile* and its control in hospital are being initiated. In addition the division has ongoing and upcoming trials on *C. difficile* vaccine, immunotherapies, and drug therapy.

The division has maintained an extremely active and high profile clinical research and development of rapid molecular assays for a number of multidrug resistant organisms most noteworthy are *C. difficile*, MRSA and carbapenemase resistant organisms (CRO). Drs. Oughton, Brukner, Longtin, and Dascal have developed a novel assay for *C. difficile* that may both assist in differentiating asymptomatic carriers from those ill from the bacteria, as well as predict severity of disease. The group has applied for a patent and studies to evaluate the assay are ongoing. An improved assay for MRSA detection has also been developed and an evaluation of its performance was published in 2013.

Dr. Mark Miller has transitioned to become the Chief Medical Officer at bioMerieux, based in France. He has retained the position of Adjunct Professor of Medicine at McGill University and continues focused research at the JGH on healthcare-associated infections, such drug-resistant bacterial infections and *C. difficile* disease. He continued, during 2013, to be the JGH principal site investigator for 2 clinical pharmaceutical studies in 2013: 1) the use of monoclonal anti-toxin antibodies to combat recurrent *C. difficile* and 2) the effectiveness of an inactivated varicella ("chicken pox") vaccine in immunocompromised patients who have undergone stem-cell transplantation. He also conducted his own study on the usefulness of serum procalcitonin and fecal calprotectin for assessing the severity of *C. difficile* infection in hospitalized patients.

## **2. Teaching and learning (undergraduate and graduate):**

Our Infection Prevention and Control hosted its first visiting international postdoctoral scientist. Supported by the Azrieli-Israel Fellowship, Dr. Deborah Ben David will spend a year (2013-4) with us supervised by Dr. Longtin (primary supervisor) and Dr. Dascal (co-supervisor). Dr. Ben David is an experienced Infectious Diseases and Infection Control physician from Sheba Hospital Medical Center at Tel Hashomer (Israel) affiliated with Sackler School of Medicine at Tel Aviv University.

Dr. Greenaway was involved in several aspects of teaching for undergraduate McGill medical students. She was involved in the curriculum development for the new Public Health Course implemented in the 2013 academic year and is axis head for Immigrant and Refugee Health and gives several lectures to the students. In 2013 she co-taught the ICM B course for five second year medical students (24 hours of clinical teaching). She also serves as an Osler fellow (2011-2015) for the McGill Physicianship Course for a group of student in the class of 2015 which includes 6-8 3-hour sessions per year. She is also involved in teaching in the Department of Epidemiology and Biostatistics at McGill in which she gives several guest lectures per year in the Clinical Epidemiology, Infectious Disease Epidemiology and Global Health courses. She is presently supervising 2 Masters Students in the Epidemiology and Biostatistics Department. Alain Ngoma a student in the MSc program and Chelsea Caya a student in the MPH program are both working on projects describing the burden of viral hepatitis in the immigrant population. She is a member of the thesis committees for 1 Masters (supervisor Marina Klein) and one PhD student (supervisor Kevin Schwartzman) in the Department of Epidemiology and Biostatistics. Finally, in 2013 she was named the Internal Medicine Resident Scholarly Activity Director for the JGH site. Her responsibilities include encouraging and facilitating residents to find an appropriate supervisor and complete a compulsory Scholarly activity during their 3 years of residency which can include any of the following; (i) a clinical vignette / case presentation / case report, (ii) a quality assurance / quality improvement (QA/QI) project, (iii) a medical education project, or (iv) a research project.

Dr. Zaharatos is a member of the McGill University Infectious Diseases/Medical Microbiology Resident Research Committee. He is a research scientist at the Lady Davis Institute where he supervises a Postdoctoral Fellow (Dr. Lara Ajamian) and a Graduate Student (Luca Melnychuk) in the Division of Experimental Medicine. He also serves as a thesis committee member of two PhD candidates in the Division of Experimental Medicine (Victor Kraemer and Said Hassounah) and was a lecturer for the course “Recent Advances in Virology and Antiviral Therapies” (EXMD632). Under Dr. Zaharatos’ mentorship and supervision, MSc candidate Luca Melnychuk received a Frederick Banting and Charles Best Canada Graduate Scholarship (Master's Award) and his abstract entitled “*HIV-1 consensus clade C gp41 ectodomain optimized for secretion and preserved binding by MPER-specific broadly neutralizing antibodies*” was accepted for presentation at the 2014 Keystone Symposia Conference –“*HIV Vaccines: Adaptive Immunity and Beyond*”.

Dr. Miller has supervised Dr. Kristin Popiel in a large 13-year evaluation of VRE control at the JGH, which has been accepted for publication in early 2014. He continues to supervise Dr. Jesse Schwartz in a project on “flesh eating disease” (Group A streptococcal necrotizing fasciitis and myositis). He maintains his teaching role by conducting small-group teaching of specialty fellows in Infectious Diseases and Clinical Microbiology in the McGill program’s Inter-hospital Infectious Disease (IHID) rounds.

Dr. Dascal who already was on the Editorial Board of the journal Diagnostic Microbiology and Infectious Disease was invited to join the Editorial Board of the prestigious Journal of Clinical Microbiology.

Division members continued their teaching in Unit 7 (Infectious Diseases) of the Faculty of Medicine.

Drs. Oughton and Dr. Dascal continued lecturing in MMIM 465.

All Division members serve as teachers and examiners for medical students, and also serve on various Hospital committees. Residents and fellows are supervised all year round on the ID consultation service and in the ID outpatient clinic.

### **3. Involvement in the community:**

Under the leadership of Dr. Greenaway and in collaboration with Dr. Malus (Family Medicine) plans for a Multicultural center have been drawn up. The next phase of its inception is to garner the required funds to assure its initial operation for the first 2 years.

### **4. Partnerships:**

Dr. Greenaway is a member of the Committee to Advise on Tropical Medicine and Travel (CATMAT) an advisory committee to the Public Health Agency of Canada (PHAC) that provides advice on Tropical and Travel Medicine related subjects through producing evidenced based statements on these topics. She has also been involved in many different aspects of the activities of the International Society of Travel Medicine (ISTM) a global organization committed to the promotion of healthy and safe travel with over 3000 members in 80 countries. She was the co-chair of the Scientific program Committee for the ISTM biannual meeting in Maastricht, Netherlands 2013. She is the co-chair of the Scientific program Committee for the upcoming ISTM biannual meeting in Quebec City, 2015. Dr. Greenaway has research collaborations with colleagues at the McGill, Montreal Chest Hospital, at Laval University and the University of Toronto.

Dr. Longtin is the sole Infectious Diseases physician member of “Prevention of Arrhythmia Device Infection Trial (PADIT)”. The trial investigates the optimal management of and prevention of device implanted to control heart rhythm (e pacemakers and implantable cardioverters / defibrillators). This study funded by CIHR is a pan Canadian endeavor.

Dr. Zaharatos with the BCAVDP award established partnerships Botswana, Netherlands and other investigators in Canada.

Drs. Dascal and Oughton continue their partnerships with the INSPQ on *C. difficile* genomics.

### **5 Milestones:**

Recruitment of Drs. Longtin and Teltscher has added new breadth and depth to our unit’s infection control and antibiotic stewardship activities.

The planning for the construction of the new JGH Microbiology Laboratories has been initiated with the expectation that the project be completed by late 2014 early 2015. This project is possible through the generous donation of Mr. Allan Rossy and his family.

Drs. Greenaway and Longtin have been very successful in obtaining research funding from CIHR. Dr. Longtin obtained an FRSQ Chercheur-Boursier Junior 1.

Our Infection Prevention and Control hosted its first visiting international postdoctoral scientist.

Supported by the Azrieli-Israel Fellowship - Dr. Deborah Ben David

Dr. Matthew Oughton, Ivan Brukner and Andre Dascal developed and evaluated a new assay for MRSA that significantly improves upon existing approved commercial assay. A novel assay for *C. difficile* was developed and application intellectual property protection has been submitted.

## **6. New hires, promotions, and retirements**

Dr. Yves Longtin has joined the Divisions of Infectious Diseases and Diagnostic Microbiology in spring 2013. Dr. Yves Longtin obtained his MD from Sherbrooke University and completed his training in Infectious Diseases and Microbiology at Laval University in 2005. Thereafter Dr. Longtin pursued a fellowship in Infection Control at the Geneva University Hospitals (HUG), Switzerland, from 2006 to 2009. Dr. Longtin practiced Infectious Diseases / Microbiology with a special interest in Infection Control at Centre Hospitalier Universitaire de Québec (CHUL) and the Institut Universitaire de Cardiologie et de Pneumologie de Québec (IUCPQ) from 2009 to 2013. He is a highly respected and acknowledged expert in Infection Control. He is a consultant to the World Health Organization for the Saves Lives: Clean Your Hands Global Initiative, consultant to a National Patient Safety Agency (U.K.), as well as a member of the Comité des Infections Nosocomiales du Québec (CINQ). Dr. Longtin's research interests include hand hygiene, contamination of the hospital environment, and *C. difficile* infections. He has been very productive academically with 17 peer reviewed publications, 1 book chapter and 15 abstracts. Upon arrival Dr. Longtin learned that he was the recipient of the FRSQ Chercheur Boursier Junior 1 award. We are proud that he has joined our institution and look forward to long and productive career at the Jewish General Hospital and McGill University.

Dr. Marty Teltscher has been an associate member of our unit since 2012 offering clinical services in the outpatient ID clinic and inpatient consultation service. As of January 2014 he will become a full time member at the JGH. Over the past three years Dr. Teltscher has undertaken intense clinical work. He has been instrumental in instituting Infectious Diseases clinical services and microbiology laboratory services at the MUHC Lachine Hospital and has been an Infectious Diseases consultant and internal medicine ward supervisor at the Montreal General Hospital. He remains associated with the MUHC J.D. MacLean Centre for Tropical Diseases and has been a member of the MUHC Chronic Viral Illness Service. Due to his dedication to undergraduate and postgraduate medical education Dr. Teltscher was recently appointed as the McGill Infectious Diseases and Microbiology Residency program director. In addition to clinical and teaching responsibilities he will work with physician and pharmacist colleagues to develop the burgeoning antibiotic stewardship program at the JGH.

Dr. Mark Miller was promoted to Full Professor at McGill University in 2012. Dr. Miller transitioned in 2013 to become the Chief Medical Officer and head of the Biomarkers Unit at bioMerieux in Lyons France. He will continue as Associate member with research and teaching activities in our unit.

Dr. Andre Dascal was appointed Chief Infectious Diseases and Microbiology in March 2013. Dr. Portnoy continues to serve the Hospital in the capacity of Director of Professional Services and all have recognized his dedication.

## **7. Honours, awards, and prizes: None to report in 2013**

## **8. Fundraising: None new to report in 2013**

## **SECTION I - DIVISION STATUS UPDATE**

### **1. Mission and objectives of the Division**

The objectives of the Division of Infectious Diseases and Microbiology remain:

- ... High-quality service to the outpatients and inpatients of the Hospital,
- ... High-quality cost effective performance in diagnostic microbiology services,
- ... Continued research in the fields of new anti-infectives, novel vaccines, and cutting-edge diagnostic techniques,
- ... Ongoing education in the vast field of Infectious Diseases for students, residents, fellows, nurses, other healthcare personnel, and affiliated fields,
- ... Develop strategies for improving the health of migrant and refugee populations by optimizing preventive and improved communication strategies

### **2. The research priorities of the division are:**

- ... Emerging infections and “super-bugs” (e.g. MRSA, VRE, CRO), especially *C. difficile* infection
- ... Novel approaches for infection prevention and control in hospitals
- ... Development of novel molecular diagnostic assays
- ... HIV immune response and vaccinology
- ... Refugee and immigrant health
- ... Vaccine-preventable diseases and new vaccines (e.g. *C. difficile*)
- ... Management and prevention of Tuberculosis
- ... Novel antibiotics and immune system modifiers for the treatment of infectious diseases.

### **3. List of academic staff, their academic rank**

Full-time (GFT) members:

- Dr. Andre Dascal, Associate Professor, Active (Chief)
- Dr. Christina Greenaway, Associate Professor, Active
- Dr. Yves Longtin Associate Professor, Active
- Dr. Matthew Oughton, Assistant Professor, Active
- Dr. Joseph Portnoy, Associate Professor, Active
- Dr. Marty Teltscher, Assistant Professor, Active (as of January 1, 2014)
- Dr. G. Zaharatos. Assistant Professor Active

Associate Member and Medical Director bioMerieux

- Dr. Mark Miller, Adjunct Professor, McGill University

Part-time (associate) members: are busy as full-time clinicians at other Montreal hospitals, contribute their time and expertise to the JGH for the high-quality clinical care which we give to our patients:

- Dr. David Portnoy
- Dr. Karl Weiss
- Dr. Donald Vinh

Diagnostic Molecular Laboratory:  
Ivan Brukner PhD – Assistant Professor

Clinical Research Nurse Coordinator of ID Research Unit (IDRU):  
Jennifer Eastmond, inf/N., BSc.N.

## **SECTION II - GRANTS, PUBLICATIONS, AND SERVICE OUTSIDE OF MCGILL**

### **1. Grants and Awards**

#### **a. Grants – Salary Awards**

Fonds de recherche en santé du Québec (FRSQ), Bourses de Chercheurs-Boursier Cliniciens, Junior 1. **Dr. Longtin Y.** “Les infections nosocomiales: Une approche globale et intégrative pour mieux comprendre et prévenir la diarrhée associée au *C. difficile* et améliorer l’hygiène des mains»2013-2017

Fonds de recherche en santé du Québec (FRSQ), Bourses de Chercheurs-Boursier Cliniciens, Junior 2. **Dr. Greenaway C.** “Infectious Diseases in Immigrants: Burden, Impact and Interventions” 2009-2013 (ended 6/2013)

JGH Department of Medicine GFT-H Clinical Research Awards. “The Burden of Infectious Diseases in New Adult Immigrants and Refugees: Reviewing the Evidence” PI: **Greenaway C.** \$12,000 June 2012-June 2013

JGH Department of Medicine GFT-H Clinical Research Awards - Detection and control of *C. difficile*. **Dascal A** \$12,000, 2012-3

#### **b.Grants – Peer Reviewed Operating**

Fonds de Recherches en Santé du Québec (FRSQ); Establishment of Young Researcher – Junior 1, PI: **Longtin Y.** 30 000\$, 2013-2016

Canadian Institutes of Health Research (CIHR) – Prevention of Arrhythmia Device Infection Trial (PANDIT) PI: Krahn AD, Co-Investigators: Bernie DH, Connolly SJ, Exner DV, Lamy A, **Longtin Y**, Philippon F. 1,639,258 \$, 2013-6

Canadian Institutes of Health Research (CIHR) - “The Childhood Varicella Vaccination Program: Will it protect or Harm the Immigrant Population?” PI: **Greenaway C**, Co-Applicants: Bartlett-Esquillant G, Boivin JF, Brisson M, Platt R, Quach-Thanh C, Schwartzman K, \$275,523 2013-2016

Canadian Institutes of Health Research (CIHR) - Interim Federal Health Program (IFH) “Accessibility and costs of healthcare for refugee claimants following changes to the Interim Federal Health Program” Co- PIs: **Greenaway C**, Glazier R, Rousseau C, Rummens A Co-Applicants: Persaud N, Ruiz-Casares M, Pottie K, Vanthuyne K, Hanley J, Cleveland J, Gagnon A, Pinto A, \$766,176 2013-2016

Canadian Institutes of Health Research (CIHR) - Team Grant: HIV/AIDS Vaccine Discovery and Social Research - June 2011 competition: The Botswana-Canada AIDS Vaccine Discovery Partnership. PI: Mark A. Wainberg & Rosemary Musonda, Co-Investigators: **Gerasimos J. Zaharatos**, Jamie K. Scott, Ralph Pantophlet, Vlad Novitsky, Max Essex, Ed Mills, Chen Liang, Bluma Brenner, Nicole Bernard, and Rogier Sanders. \$2.47 million CAD over 3 years, 2012-2015

Canadian Institutes of Health Research (CIHR) - "Reducing inequalities in the burden of human papillomavirus (HPV) related diseases in Canada through optimal vaccination and screening policies: A multidisciplinary model-based approach" PI: Brisson M, Boily MC, Deeks S. Co-investigators: Coldman A, Franco E, **Greenaway C**, Harper S, Kliewer E, Mayran MH, Ogilvie G, Paszat L, Van de Velde N. \$532,776, 2012-2015

LDI Clinical Research Pilot Project (CliPP) grant (awarded June 2013)-Telomere Length Analysis of HIV Antigen-Specific Memory B-cells. PI: **Gerasimos J. Zaharatos** Co-Investigator: Chantal Autexier. \$25,000 CAD over 2013-4

**Greenaway C**, Menzies R. Understanding the keys to tuberculosis: from exposure to infection and from infection to disease. 2007-present. (Protocol #07-015)

#### c. Grants – Industry

JGH Local PI: **Greenaway C**. Local Co-investigators: **Longtin Y, Miller M, Oughton M, Portnoy J, Zaharatos G**. Sanofi Pasteur - "Efficacy, Immunogenicity, and Safety Study of *Clostridium difficile* Toxoid Vaccine in Subjects at Risk for *C. difficile* Infection" \$135,000 2013-2015, Protocol #13-064

JGH Local PI **Miller M**, Local Co-investigators: **Greenaway C, Zaharatos GJ, Oughton M**. A phase 2, Randomized, Double-Blind, Placebo-Controlled, Dose Ranging Study To Assess The Safety And Efficacy Of Vp 20621 For Prevention of *C. difficile* infection (CDI) with oral prophylactic administration of non-toxigenic *C. difficile*. (Viropharma Inc.) November 2011 – May 2013. \$100,000 (Protocol #11-117)

JGH Local PI: **Miller M**, Local Co-investigators: **Greenaway C, Oughton M, Zaharatos GJ**, A multi-center, double-blind, randomized, active reference, parallel group study to evaluate the efficacy, safety and tolerability of a 10-day twice daily oral administration of 3 doses of ACT-179811 in subjects with *Clostridium difficile* infection (CDI). (Actelion Pharma Inc.) December 2010- January 2013. \$85,000 (Protocol #10-156)

JGH Local PI: **Miller M**, Local Co-investigators: **Greenaway C, Zaharatos GJ, Oughton M**, Gyger. A Phase III, Double-Blind, Randomized, Placebo-Controlled, Multicenter Clinical Trial Study, Tolerability, Efficacy and Immunogenic of V212 in the Prevention of Shingles in Patients Receiving an Autologous Bone Marrow or Stem Cell Transplant. Merck Inc. (Merck). August 2011 - present. \$75,000 (Protocol #11-051)

JGH Local PI: **Greenaway C**, Local Co-investigators: **Zaharatos GJ, Oughton M Miller M**. A Study to Appraise the Proposed Surveillance Model for *Clostridium difficile* Infection to be used in the Sanofi Pasteur Phase 111 Vaccine Efficacy Study CDI16- (Sanofi Pasteur). December 2012- May 2013. (Protocol 12-144)



JGH Local PI: **Miller M, Oughton M**, Local Co-investigators: **Greenaway C, Zaharastos GJ**. A Phase 111, Randomized, Double-Blind, Placebo-Controlled, Adaptive Design Study of the Efficacy, Safety and Tolerability of a Single Infusion of MK-3415 (Human Monoclonal Antibody to *Clostridium difficile* toxin A), MK-6072 (Human Monoclonal Antibody to *Clostridium difficile* toxin B) and MK-3415 (Human Monoclonal Antibody to *Clostridium difficile* toxin A and B) in Patients Receiving Antibiotic Therapy for *Clostridium difficile* Infections (Modify 1) – (Merck). March 2012- present. (Protocol # MP- CSSSTR11-017)

d. Grants Funded by JGH, MUHC and Division

**Miller M**, and Loo V, Household Transmission of *C. difficile*, Jan 2010 – Present Protocol # *McGill A01-M128-09B*

**Miller M**, Vinh D. Immunogenetic defects in adults with laryngeal papillomatosis. (Investigator-initiated research with own funding). August, 2011 – present. (Protocol #12-060)

**Miller M**, Leung V, Manges A. Fecal transplantation for treating recurrent *C. difficile* infection. (Investigator-initiated research with own funding). June 2010 – present. (Protocol # 10-050)

**2. Scholarly works published in the 2011 to 2013:**

**Publications 2013**

McCarthy AE, Weld L, Barnett ED, So H, Coyle C, **Greenaway C**, Stauffer B, Leder K, Lopez-Valez R, Gautret P, Castelli F, Jenks N, Walker P, Louton L, Cetron M. Spectrum of Illness in International Migrants Seen at GeoSentinel Clinics in 1997-2009, Part 2: Migrants Resettled Internationally and Evaluated for Specific Health Concerns. *Clinical Infectious Diseases* 2013 Apr; 56(7):925-33.

Drolet M, Boily M-C, **Greenaway C**, Deeks SL, Blanchette C, Laprise J-F, Brisson M. Sociodemographic inequalities in sexual activity and cervical cancer screening: Implications for the success of Human Papillomavirus (HPV) vaccination. *Cancer Epidemiology, Biomarkers and Prevention* 2013; 22:641-652.

\*Okraïnec K, **Miller M**, Holcroft C, Boivin JF, **Greenaway C**. Assessing the need for a medical interpreter: are all questions created equal? *Journal of Immigrant and Minority Health* 2013;15. DOI 10.1007/s10903-013-9821-9.

\*Rossi C, Schwartzman K, Oxlade O, Klein M, **Greenaway C**. Hepatitis B screening and vaccination strategies for newly arrived adult Canadian immigrants and refugees: a cost-effectiveness analysis. *PlosOne* 2013; 8(10):e78548.

**Greenaway C**, Boivin JF, Cnossen C, Rossi C, Tapiero B, Schwartzman K, Olson S, Miller M. Risk factors for susceptibility to varicella in newly arrived adult migrants in Canada. *Epidemiology and Infection*. 2013; 1-13. [Epub ahead of print]

Rashid M, **Greenaway C**. Hepatitis B virus screening and vaccination in a family from Nigeria. *Canadian Medical Association Journal* 2013; 185(16):1417-8.

Connolly SJ, Philippon F, **Longtin Y**, Casanova A, Birnie DH, Exner DV, Dorian P, Prakash R, Alings M, Krahn AD. Randomized Cluster Crossover Trials for Reliable, Efficient, Comparative Effectiveness Testing: Design of the Prevention of Arrhythmia Device Infection Trial (PADIT). *Can J Cardiol*. 2013 Jun; 29(6): 652-8.

Dionne LL, Raymond F, Corbeil J, Longtin J, Gervais P, **Longtin Y**. Correlation between *Clostridium difficile* Bacterial Load, Commercial Real-time PCR Cycle Thresholds, and Results of Diagnostic Tests Based on Enzyme Immunoassay and Cell-Culture Cytotoxicity Assay. *J Clin Microbiol*. 2013 Nov; 51(11):3624-30. doi: 10.1128/JCM.01444-13. Epub 2013 Aug 21.

**Y. Longtin**, S. Trottier, G. Brochu, B. Paquet-Bolduc, C. Garenc, V. Loungnarath, C. Beaulieu, D. Goulet, J. Longtin. Impact of the Type of Diagnostic Assay on *Clostridium difficile* Infection and Complication Rates in a Mandatory Reporting Program. *Clin Infect. Diseases*. 2013 Jan; 56(1): 67-73.

**Y. Longtin**, N. Farquet, A. Gayet-Ageron, H. Sax, T. Perneger, D. Pittet. Caregivers' Perceptions of Patients as Reminders to Improve Hand Hygiene. *Arch Intern Med*. 2013. Oct 22;172(19): 1516-7.

Brukner I, Oughton M, Giannakakis A, Kerzner R, and Dascal A. Significantly Improved Performance of a Multitarget Assay Over a Commercial SCCmec-Based Assay for Methicillin-Resistant *Staphylococcus aureus* Screening: Applicability for Clinical Laboratories. *J Mol Diagn*. 2013 Sep;15(5):577-80. doi: 10.1016/j.jmoldx.2013.04.009. Epub 2013 Jul 16.

**Zaharatos GJ** and Wainberg MA. replication. *Ann Med*. 2013 May;45(3):236-41.

Louie TJ, **Miller MA**, Crook DW, Lentnek A, Bernard L, High KP, Shue Y-K, Gorbach SL. Effect of age on treatment outcomes in *Clostridium difficile* infection. *J Am Geriatric Soc* 2013;61:222-30

**Miller M**, Louie T, Mullane K, Weiss K, Lentnek A, Golan Y, Kean Y and Sears P. Derivation and validation of a simple clinical bedside score (ATLAS) for *Clostridium difficile* infection which predicts response to therapy. *BMC Infectious Diseases* 2013;13:148-54

Lynch T, Chong P, Zhang J, Hizon R, Du T, Graham MR, Beniac DR, Booth TF, Kibsey P, **Miller M**, Gravel D, Mulvey MR, Canadian Nosocomial Infection Surveillance Program (CNISP). Characterization of a Stable, Metronidazole-Resistant *Clostridium difficile* Clinical Isolate. *PLoS ONE* 2013;8(1): e53757. doi:10.1371/journal.pone.0053757

Cornely OA, **Miller MA**, Fastin B, Mullane K, Kean Y, Gorbach SL. Resolution of *Clostridium difficile*-associated diarrhea in cancer patients treated with fidaxomicin or vancomycin. *J Clin Oncology* 2013;31:2493-9

Miedzybrodski B, **Miller MA**. A lactating woman presenting with puerperal pneumococcal mastitis: a case report. *J Med Case Reports* 2013;7:114

Mullane K, Cornely O, Crook D, Golan Y, Louie T, **Miller M**, et al. Renal Impairment and Clinical Outcomes of *Clostridium difficile* Infection in Two Randomized Trials. *American Journal of Nephrology* 2013;38:1-11

Haraoui L-P, Levesque S, Lefebvre B, Blanchette R, Tomkinson M, Matasejec L, Mulvey MR, **Miller MA**. Polyclonal Outbreak of KPC-3-producing *Enterobacter cloacae* at a Single Hospital in Montréal, Canada. *JCM* 2013;51:2406-8

Sinclair A, Xie X, **Teltscher M**, Dendukuri N. Systematic review and meta-analysis of a urine-based pneumococcal antigen test for diagnosis of community-acquired pneumonia caused by *Streptococcus pneumoniae*. *J Clin Microbiol.* 51(7):2303-10. 2013.

#### Book Chapters

**Greenaway C**, Khan K, Schwartzman K. Tuberculosis Surveillance and Screening in high-risk populations. In Menzies D, ed. *Canadian Tuberculosis Standards (7th ed.)*. Ottawa: Canadian Lung Association and Health Canada. *Can Respiratory Journal* 2013;20 SupplA:119A-128A.

**Oughton MT** and **Dascal A**, *Acute Infectious Diarrhea*, Bope & Kellerman: *Conn's Current Therapy* 2013, Elsevier Saunders Philadelphia

### 3. Academic and community engagement service outside of McGill

Dr. Greenaway was an invited lecturer at the IUATLD, ICAAC and at Université Laval . She also served as Associate Chair of the Scientific Committee for the 13<sup>th</sup> Annual Conference of the International Society of Travel Medicine CISTM-13 to be held in Maastricht, Netherlands, May 2013, as well as Chair of the Migrant Interest group for the International Society of Travel Medicine (ISTM). She is a member of the Committee to Advise on Tropical Medicine and Travel (CATMAT) an advisory committee to the Public Health Agency of Canada (PHAC) that provides advice on Tropical and Travel Medicine related subjects through producing evidenced based statements on these topics (since 2002).

Dr. Zaharatos served as an examiner for the Royal College of Physicians in Medical Microbiology. He also is a member, in addition he sits on the Provincial HIV Diagnostics Committee (Comité du programme provincial de diagnostic de laboratoire de l'infection à VIH)

Dr. Longtin has numerous activities outside McGill : Institut National de Santé Publique du Québec (INSPQ) 2009- Present. President of the provincial surveillance committee on *Clostridium difficile*-associated diarrhea, Institut National de Santé Publique du Québec (INSPQ) 2009- Present. Member of the Provincial Infection Control Committee [Comité des Infections Nosocomiales du Québec (CINQ)], University of Geneva Hospitals 2009-Present. Consultant for a cluster randomized trial on patient participation to improve hand hygiene compliance. (Sponsor: Swiss National Fund ), World Health Organization 2006-Present, Member of the Core Group on Hand Hygiene f) World Health Organization 2006-Present. Consultant for the First Global Safety Challenge g) National Patient Safety Agency (U.K.) 2007-Present. Consultant for implementation of patient empowerment program to increase hand hygiene

Dr. Dascal was the Infectious Disease / Microbiologist consultant to the Montreal Department of Public Health.

Dr. Dascal and Oughton continue their partnerships with the INSPQ on *C. difficile* genomics.

## **SECTION III - CLINICAL ACTIVITIES**

### **a. Clinical Infectious Diseases**

The division is responsible for a large number of inpatient consultations at the JGH and supervises the Diagnostic Microbiology laboratories. Resident and subspecialty fellow teaching are valued aspects of these services.

The walk-in outpatient Infectious Diseases Clinic operates on a daily basis (Monday to Friday) in the mornings (registration 07:30-10:30 and sees 25-40 patients per day). The clinic is staffed on rotation by Infectious Diseases specialists (i.e. Drs. David Portnoy, Dascal, Weiss, M Teltscher, M. Oughton and C. Greenaway). The clinic also provides teaching to residents who request this clinic as an elective.

Drs. Joseph Portnoy, Dascal, Oughton, Longtin, Greenaway, Zaharatos also are responsible for close to 500 patients receiving home IV antibiotic (OPAT program) after being discharged from the JGH.

The Division also has a weekly Tuberculosis (TB) Clinic (Thursday afternoons) which handles patients with active tuberculosis as well as a screening for potential TB. The clinic is involved with the Public Health Department for TB contact-tracing in the Montreal area. This clinic is staffed by Drs. Greenaway, Palayew, Weiss, and Oughton.

In addition to his HIV vaccine related research, Dr. Zaharatos has maintained an active and growing HIV clinical practice. He also continues to be a co-investigator in clinical studies conducted at the JGH by our division.

There were more than 19,000 patient visits in Infectious Diseases Clinic, Tuberculosis and the GFT offices during the past year. Drs. Portnoy, Dascal, Zaharatos, Oughton, Miller, and Greenaway, see patients in their clinical offices. There were over 6,100 in-patient consultations requested during the year.

Dr. Miller also continues to perform fecal microbiome transplants (FMT) for the treatment of multiply-recurring *C. difficile* infection (CDI), as part of a microbiome research collaboration. Dr. Teltscher is expected to take on this therapy in 2014.

### **b. Clinical Microbiology**

OptiLab, a ministry driven project that is rationalizing and consolidating clinical laboratories in the province has chosen our JGH lab to become a "laboratoire serveur". The program of OptiLab will reduce the number of laboratories from about 20 on the island of Montreal to 5 such "Pods" each with a central "laboratoire serveur". Our JGH laboratory will become the "laboratoire serveur" that will incorporate and service St Mary's Hospital and the Lakeshore hospital as well as a number of CSSSs. This program is evolving at a rapid pace and Dr. Dascal has been and continues to be involved in numerous planning and implementation activities with the Agence. Clearly the importance, size and complexity of the JGH microbiology laboratory are and will evolve at a rapid pace in the next 5 years.

This new and increasing responsibility for a greater Montreal population coincides with the renovation and upgrading of our JGH lab thanks to a generous donation of Rossy family. The plans

have been drawn up and the contractor has been chosen. Construction is expected to start in the first half of 2014.

In order to offer a better service to our clientele the serology section of Microbiology has been merged into the Core Laboratory of the JGH. This merger spearheaded by Dr. Zaharatos will permit 7/24 (around the clock 7 days a week) capacity for performing most common serologic test which previously could be run only 5 days a week from 08:00-16:00.

A number of assays (eg malaria, multidrug resistant organisms) have been optimized and implemented.

### **c. Infection Prevention and Control**

Dr. Yves Longtin has taken over the leadership of the Infection Prevention and Control service of the hospital. He brings to it many years of experience in Infection Control and is in the process of renewing this service in collaboration with the Department of Nursing and the IPAC practitioners. Since his arrival the JGH *C. difficile* rates have been lowered dramatically and have remained low for several months. He also managed amongst others: multidrug resistant organism outbreaks and TB exposure events successfully.

## **CONFIDENTIAL INFORMATION**

### **1. Consulting activities:**

Dr. Mark Miller has transitioned to become the Chief Medical Officer at bioMerieux, based in France. He has retained the position of Adjunct Professor of Medicine at McGill University and continues focused research at the JGH on healthcare-associated infections, such drug-resistant bacterial infections and *Clostridium difficile* disease.

Respectfully submitted

Andre Dascal, MD, FRCPC, FIDSA  
Chief, Division of Infectious Diseases and Diagnostic Microbiology