

Annual Report
Division of Infectious Diseases
Department of Medicine - Jewish General Hospital
January 1 - December 31, 2016

SUMMARY

1. Research and publications:

Dr. Yves Longtin was a co-author of an important paper in Lancet Infectious Diseases entitled “Performance feedback and patient participation to improve healthcare worker hand hygiene compliance in the setting of established multimodal promotion: a cluster randomised controlled trial.” and the lead author on a JAMA Internal Medicine article, entitled “Effect of Detecting and Isolating Clostridium difficile Carriers on the Incidence of C. difficile Infections: A Quasi-Experimental Controlled Study”. In 2016, **Dr. Longtin** received research funding from industry for investigator initiated studies from Merck (\$25,912.80) and Becton Dickinson (\$148,000). Dr. Longtin continued being funded as a Clinical Research Scholar (Junior 1) by the Fonds de Recherche Santé Québec. He also continued collaborative work in infectious disease prevention, particularly C. difficile on CIHR funded projects (PI Marc Brisson) and on rapid molecular detection of hospital acquired multi-resistant organisms with funding from the Fonds de partenariat pour un Québec innovant et en santé (PI Michel Bergeron).

Dr. Christina Greenaway was the senior author on two articles in the prestigious journal Clinical Infectious Diseases, one entitled “Risk of Active Tuberculosis in Patients with Cancer: A Systematic Review and Meta-Analysis.” and another entitled “Hospitalizations in Immigrants and Non-Immigrants Diagnosed with Chronic Hepatitis C Infection in Quebec.” In 2016, **Dr. Greenaway** was awarded funding as a co-investigator and member of The National CIHR Hepatitis C Network on a CIHR Team Grant (PI Naglaa Shoukry).

Dr. Zaharatos continued work in the realm of infectious disease vaccine and adjuvant discovery with ongoing funding from the Peer Reviewed Medical Research Program of the US Department of Defense (PI Gerasimos J. Zaharatos) as well as a CIHR Team Grant (PI Mark Wainberg).

Dr. Brukner (and co-investigators Longtin, Oughton and Dascal) continued work on molecular methods to quantify bacterial load and C. difficile in stool with ongoing funding from a CIHR Proof-of-Principle Grant.

2. Teaching and learning (undergraduate and graduate):

Members of the division were lecturers for both the undergraduate and graduate McGill community. All division members were actively involved in bed-side teaching and supervision of medical residents and particularly Infectious Diseases/Medical Microbiology residents. **Dr. Longtin** received the McGill University Infectious Diseases/ Medical Microbiology Excellence in Teaching Award. **Dr. Oughton** was appointed as the new McGill University Medical Microbiology and (adult) Infectious Diseases Residency Training Program Director. In addition, **Dr. Zaharatos** supervised a Postdoctoral Fellow, **Dr. Greenaway** supervised a Masters student

and each was a member of several McGill graduate student thesis committees.

3. Involvement in the community:

Members of the division had extensive involvement in the larger medical and scientific community. Activities included continuing medical education, journal editorial board participation, and numerous committee memberships. Important committee memberships included those for bodies such as the Royal College of Physicians (**Drs. Zaharatos & Oughton**), Quebec Provincial Surveillance Program on Healthcare-Associated Infections (**Dr. Longtin**),

Canadian Nosocomial Infection Surveillance Program (**Dr. Longtin**), International Society of Travel Medicine (**Dr. Greenaway**), Committee to Advise on Tropical Medicine and Travel [advisory committee to the Public Health Agency of Canada] (**Dr. Greenaway**), and the Comité du programme provincial de diagnostic de laboratoire de l'infection à VIH (**Dr. Zaharatos**). **Dr. Zaharatos** was a reviewer for the CIHR Project Grant Program Fall 2016 competition. **Dr. Longtin** was a reviewer for the MITACs Elevate Postdoctoral Fellowship 2016 program.

4. Partnerships:

Along with colleagues across Canada, **Dr. Greenaway** began work as a co-investigator of the National CIHR Hepatitis C Network, lead by colleagues at the CHUM. She also has ongoing research collaborations with colleagues at the MUHC. **Dr. Longtin** has ongoing research collaborations with colleagues at the MUHC and Université de Laval.

5. Milestones:

Construction of the new JGH Microbiology Laboratories was fully completed in 2016, including the certification and opening of a modern biosafety level-3 tuberculosis laboratory. The entire project was made possible through a very generous donation from Mr. Allan Rossy and his family.

6. New hires, promotions, and retirements

Dr. Karl Weiss, formerly an associate member, joined our group as a full-time physician in the Fall of 2016. **Dr. Andre Dascal** was appointed Medical Director of the new OPTILAB MUHC Cluster.

7. Honours, awards, and prizes: There was nothing additional to report for 2016.

8. Fundraising: There was no new fundraising to report for 2016.

SECTION I - DIVISION STATUS UPDATE

1. Mission and objectives of the Division

While the mid 20th Century celebrated the conquest of infectious diseases thanks to new vaccines and antibiotics, the story of the late 20th Century and early 21st Century has unfolded

with a disquieting series of emerging and re-emerging infectious disease threats. For much of the North American population, the words tuberculosis, HIV, Hepatitis C, SARS, MERS, Ebola and Zika remain abstract concepts. Yet, the combination of increasing globalization, international travel and a strained public health system threatens to bring these entities to everyone's doorstep. Common illnesses such as pneumonia, meningitis, and blood stream or urinary tract infections are ever present and thus represent a daily threat to our local community. Hospitalized patients and the elderly are at risk for panoply of different infectious disease complications. Moreover, many serious medical conditions like diabetes and kidney disease predispose patients to acquiring life-threatening infectious diseases. Those with weakened immune systems, including patients on cancer treatment or those on immune suppressing drugs for inflammatory bowel disease (e.g. Crohn's disease) or rheumatologic disease (e.g. rheumatoid arthritis) are especially vulnerable. Burgeoning antibiotic resistance and a paucity of new antibiotics threatens to make these conditions near impossible to treat.

The mission of the Division of Infectious Diseases at the JGH is to prevent, diagnose and treat transmissible illnesses, educate physicians and other health care professionals and advance the knowledge of our specialty through high caliber research. The accomplishment of these is based upon compassionate patient-centered care and a dedication to protect the health and welfare of the community at large. It should be noted that members of the Division have a dual role in both Infectious Diseases (in the Department of Medicine) and Medical Microbiology (within Diagnostic Medicine in 2016 and subsequently as of April 2017 within the centralized biomedical laboratory OptiLab-MUHC Cluster). Importantly, our Division is also responsible for directing two essential institutional programs: Infection Prevention and Control and Antibiotic Stewardship. By tackling acquired infections (including drug-resistant organisms) as well as minimizing inappropriate anti-infective use, these two programs are critical for the well-being of patients at the JGH and our affiliated institutions.

The JGH Infectious Diseases and Medical Microbiology team accomplishes its mission via the following structured elements:

- High quality inpatient and outpatient clinical care
- Direction and supervision of the Medical Microbiology Laboratories to achieve high quality, timely and cost effective detection of infectious agents and pioneer new methods in diagnostic bacteriology
- Direction and supervision of the Infection Prevention and Control Program
- Direction and supervision the Antibiotic Stewardship Program
- Educational responsibilities in McGill University's Faculty of Medicine through teaching students, residents, fellows, nurses and other healthcare personnel in affiliated fields
- Advancing knowledge by performing peer reviewed funded research (CIHR, FRSQ, DoD USA)
- Community outreach and education through frequent appearances on the media regarding infectious disease topics of interest
- Education of health-care professionals in Quebec and Canada through conferences, lectures and new information media (web-based education)

The research activities and priorities of the Division of Clinical Microbiology include:

- Emerging infections and drug resistant organisms (e.g. MRSA, VRE, CRO), especially C. difficile infection (Drs. Weiss, Longtin, Teltscher and Dascal)
- Novel approaches for infection prevention and control in hospitals (Dr. Longtin)
- Development of novel molecular diagnostic assays (Drs. Oughton, Brukner and Dascal)
- HIV immune response and vaccinology/vaccine development science (Dr. Zaharatos)
- Vaccine-preventable diseases and new vaccine evaluation (e.g. C. difficile) (Drs. Weiss and Oughton)
- Novel antibiotics and immune system modifiers for the treatment of infectious diseases (Dr Weiss)
- Management and prevention of Tuberculosis (Dr. Greenaway)
- Refugee and immigrant health (Dr. Greenaway)

2. A nominative list of academic staff, their academic rank

Full-time (GFT) physician members:

- Dr. Andre Dascal, Associate Professor (Chief)
- Dr. Christina Greenaway, Associate Professor
- Dr. Yves Longtin, Associate Professor
- Dr. Matthew Oughton, Assistant Professor
- Dr. Joseph Portnoy, Associate Professor
- Dr. Marty Teltscher, Assistant Professor
- Dr. Karl Weiss, Professor
- Dr. Gerasimos J. Zaharatos, Assistant Professor (Associate Chief)

Part-time physician members (associate members that have full-time positions elsewhere but who contribute their time and expertise on a part-time basis to the JGH Unit):

- Dr. David Portnoy (Montreal General Hospital)
- Dr. Maria Arrietta (Lakeshore General Hospital)
- Dr. Mark Miller (Adjunct Professor, McGill University and Medical Director bioMérieux)

Diagnostic Molecular Microbiology Laboratory:

- Ivan Brukner PhD, Assistant Professor

Infection Prevention and Control Service:

- Dr. Yves Longtin
- Silvana Perna RN

Antibiotic Stewardship:

- Dr. Marty Teltscher
- Stephanie Lam, PharmD

- Ryan Kerzner, MSc
- Renaud Ray, PharmD

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

1. Grants and awards received

Internal funding (JGH) in 2016

Drs. Longtin, Teltscher and Zaharatos each received a Clinical Research Award.

Drs. Greenaway, Oughton, Longtin and Zaharatos each received Physician Scientist Salary Support.

External Funding in 2016 (new and ongoing)

New funding

Greenaway

The National CIHR Hepatitis C Network.
National Hepatitis C Collaborative Network CIHR Team Grant
Principal investigator: Dr. Naglaa Shoukry
Co-Investigator: **Dr. Christina Greenaway**

Longtin

Clinical Evolution of *C. difficile* Asymptomatic Carriers Identified on Hospital Admission and Impact of Primary Prophylaxis to prevent *C. difficile* Infections.
Merck Investigator Studies Program. CAD \$25,912.80.
Principal investigator: **Dr. Yves Longtin**

Effectiveness of Isolating *Clostridium difficile* Asymptomatic Carriers on the Incidence of Infections (EFFICACI): A Cluster Randomized Feasibility Trial.
Becton Dickinson Company, Investigator Initiated Research Grant. CAD \$148,000
Principal investigator: **Dr. Yves Longtin**

Previously awarded but funding ongoing in 2016

Brukner

A new qPCR method for the assessment of total/relative bacterial load from stool samples: *Clostridium difficile* show case.
CIHR Proof of Principle Grant
Principal Investigator: **Dr. Ivan Brukner**
Co-investigators: **Drs. Andre Dascal, Yves Longtin and Matthew Oughton**

Longtin

Using mathematical modeling and health economics to evaluate and optimize infectious disease prevention strategies.

CIHR Foundation Grant

Principal Investigator: Dr. Marc Brisson

Co-investigator: **Dr. Yves Longtin**

Reducing the burden of hospital-associated Clostridium Difficile infections in Canada through optimal prevention policies: A multidisciplinary individual-based modeling approach.

CIHR Operating Grant

Principal Investigator: Dr. Marc Brisson

Co-investigator: **Dr. Yves Longtin**

Diagnostic moléculaire rapide pour le contrôle des infections acquises à l'hôpital et/ou multirésistantes.

Fonds de partenariat pour un Québec innovant et en santé (FPQIS)

Principal Investigator: Dr. Michel Bergeron

Collaborator: **Dr. Yves Longtin**

Clinical Research Scholar (Bourse chercheur-clinicien – Junior 1)

Fonds de Recherche Santé Québec

Recipient: **Dr. Yves Longtin**

Zaharatos

Unlocking Barriers to DNA Vaccine Immunogenicity: A Cross-Species Analysis of Cytosolic DNA Sensing in Skeletal Muscle Myocytes.

Discovery Award, Peer Reviewed Medical Research Program

Congressionally Directed Medical Research Programs, US Department of Defense

Principal Investigator: **Dr. Gerasimos J. Zaharatos**

The Botswana-Canada AIDS Vaccine Discovery Partnership.

CIHR Team Grant in HIV/AIDS Vaccine Discovery and Social Research

Principal Investigator: Dr. Mark A. Wainberg

Co-Investigator: **Dr. Gerasimos J. Zaharatos**

2. Scholarly works published in the 2016 calendar year:

Dascal

Epidemiological features of influenza in Canadian adult intensive care unit patients.

Taylor G, Abdesselam K, Pelude L, Fernandes R, Mitchell R, McGeer A, Frenette C, Suh KN, Wong A, Katz K, Wilkinson K, Mersereau T, Gravel D and the Canadian Nosocomial Infection Surveillance Program (CNISP) including **Dascal A**. Epidemiol Infect. 2016 Mar;144(4):741-50.

Comparison of Pulsed-Field Gel Electrophoresis and Whole Genome Sequencing in *Clostridium difficile*. LY Kong, D Eyre, AS Walker, J Corbeil, M Wilcox, AM Bourgault, **A Dascal**, MT Oughton, S Michaud, B Toye, E Frost, L Poirier, P Brassard, N Turgeon, R Gilca, V Loo
Open Forum Infect Dis (2016) 3 (suppl 1):2063.

Greenaway

Risk of Active Tuberculosis in Patients with Cancer: A Systematic Review and Meta-Analysis. Cheng MP, Abou Chakra CN, Yansouni CP, Cnossen S, Shrier I, Menzies D, **Greenaway C**.
Clin Infect Dis. 2016 Dec 16.

Searching for sex- and gender-sensitive tuberculosis research in public health: finding a needle in a haystack. Vissandjee B, Mourid A, **Greenaway CA**, Short WE, Proctor JA.
Int J Womens Health. 2016 Dec 15;8:731-742.

Hospitalizations in Immigrants and Nonimmigrants Diagnosed With Chronic Hepatitis C Infection in Québec. Kamstra R, Azoulay L, Steele R, Klein MB, **Greenaway C**. Clin Infect Dis. 2016 Dec 1;63(11):1439-1448.

The impact of migration on tuberculosis epidemiology and control in high-income countries: a review. Pareek M, **Greenaway C**, Noori T, Munoz J, Zenner D. BMC Med. 2016 Mar 23;14:48.

Caring for a newly arrived Syrian refugee family. Pottie K, **Greenaway C**, Hassan G, Hui C, Kirmayer LJ. CMAJ. 2016 Feb 16;188(3):207-11.

Longtin

Mulvey MR, Haraoui LP, **Longtin Y**. Multiple Variants of *Klebsiella pneumoniae* Producing Carbapenemase in One Patient. N Engl J Med. 2016 Dec 15;375(24):2408-2410.

Stewardson AJ, Sax H, Gayet-Ageron A, Touveneau S, **Longtin Y**, Zingg W, Pittet D. Performance feedback and patient participation to improve healthcare worker hand hygiene compliance in the setting of established multimodal promotion: a cluster randomised controlled trial. Lancet Infect Dis 2016. Sep 2. S1473-3099(16)30256-0.

Al-Ghounaim M, **Longtin Y**, Gonzales M, Merckx J, Winters N, Quach C. *Clostridium difficile* Infections (CDI) in Children: Impact of the diagnostic method used on infection rates. Infect Control Hosp Epidemiol 2016. Jun 6:1-7.

Deyneko A, Cordeiro F, Berlin L, Ben-David D, Perna S, **Longtin Y**. Impact of Sink Location on Hand Hygiene Compliance after Care of Patients with *Clostridium difficile* Infection: a Cross-Sectional Study. BMC Infect Dis 2016. May 16;16:203.

Levesque S, **Longtin Y**, Domingo MC, Massé C, Bernatchez H, Gaudreau C, Tremblay C. *Enterococcus pallens* as a potential novel human pathogen: three cases of spontaneous bacterial peritonitis. JMM Case Reports 2016.

Tschopp C, Schneider A, **Longtin Y**, Renzi G, Schrenzel J, Pittet D. Predictors of heavy stethoscope contamination following a physical examination. *Infection Control and Hospital Epidemiol.* 2016 Jun;37(6):673-9.

Longtin Y, Paquet-Bolduc B, Gilca R, Garenc C, Fortin E, Longtin J, Trottier S, Gervais P, Roussy JF, Levesque S, Ben-David D, Cloutier I, Loo VG. Effect of Detecting and Isolating *Clostridium difficile* Carriers on the Incidence of *C. difficile* Infections: A Quasi-Experimental Controlled Study. *JAMA Intern Med* 2016 Jun 1;176(6):796-804.

Gray AP, Allard R, Paré R, Tannenbaum T, Lefebvre B, Levesque S, Mulvey M, Maalouf L, Perna S, **Longtin Y**. Management of a hospital outbreak of extensively drug-resistant *Acinetobacter baumannii* using a multimodal intervention including daily chlorhexidine baths. *J Hosp Infect.* 2016 May;93(1):29-34.

Oughton

Comparison of Pulsed-Field Gel Electrophoresis and Whole Genome Sequencing in *Clostridium difficile*. LY Kong, D Eyre, AS Walker, J Corbeil, M Wilcox, AM Bourgault, A Dascal, **MT Oughton**, S Michaud, B Toye, E Frost, L Poirier, P Brassard, N Turgeon, R Gilca, V Loo *Open Forum Infect Dis* (2016) 3 (suppl 1):2063.

Medical Management for the Treatment of Nontuberculous Mycobacteria Infection of the Parotid Gland: Avoiding Surgery May Be Possible. E Kay-Rivest, S Bouhabel, **M Oughton**, MP Hier. *Case Rep Med*, 2016:4324525, Epub 2016 Jun 1.

Zaharatos

Zika: Le point sur la situation. Boucoiran I, Renaud C and **Zaharatos GJ**. *Le Specialiste.* 2016; 10 (1): 20.

3. Academic and community engagement service outside of McGill by individual members of the unit

Greenaway

- Member, Migrant and Refugee Health Interest Group Steering Council, International Society of Travel Medicine
- Advisory Committee Member, Tropical Medicine and Travel Advisory Committee to the Public Health Agency of Canada

Oughton

- Member, Royal College of Physicians and Surgeons of Canada Specialty Committee on Infectious Diseases
- Member, McGill Infectious Diseases and Medical Microbiology Resident Program Committee
- Member, McGill Infectious Diseases and Medical Microbiology Promotions Committee

Longtin

- Member, Quebec Provincial Surveillance Program on Carbapenemase-Producing Enterobacteriaceae. Quebec Provincial Surveillance Program on Healthcare-Associated Infections.
- Member, Canadian Nosocomial Infection Surveillance Program. C. difficile infection surveillance group.
- President, Provincial Surveillance Committee on Clostridium difficile-associated diarrhea, Institut National de Santé Publique du Québec
- Member, Provincial Infection Control Committee [Comité des Infections Nosocomiales du Québec (CINQ)], Institut National de Santé Publique du Québec

Weiss

- President, Association des médecins microbiologistes infectiologues du Québec (AMMIQ).
- Member, CIHR Steering Committee on Antibiotic Resistance

Zaharatos

- Executive Committee Member, Royal College Medical Microbiology Examination Committee
- Reviewer, CIHR Project Grant Program Fall 2016 competition
- Member, Comité du programme provincial de diagnostic de laboratoire de l'infection à VIH (Committee for the Provincial Program in Laboratory Diagnosis of HIV)

SECTION III - CONFIDENTIAL INFORMATION

1. Consulting activities:

None to report

Respectfully submitted,

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Associate Chief of Infectious Diseases & Medical Microbiology
and
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