Introduction to Genomic Epidemiology of Infectious Diseases

McGill University • Montreal • June 19-23, 2017




Course Directors

Marcel Behr, MD, MSc
Robyn Lee, PhD
Erwin Schurr, PhD

Day 1	Day 2	Day 3	Day 4	Day 5
Mon • June 19	Tues • June 20	Wed • June 21	Thurs • June 22	Fri • June 23
8.00AM – 5.00PM	**9.00AM – 5.00PM**	**9.00AM – 5.00PM**	**9.00AM – 5.00PM**	**9.00AM – 3.30PM**
Introduction to Genomic Epidemiology and WGS data analysis I	WGS data analysis II	Using WGS to infer transmission of bacterial pathogens	Using WGS to predict antimicrobial resistance	Beyond bacteria: other applications & practical considerations

HOSTS

McGill | Global Health Programs / Programmes de santé mondiale | Centre international de TB McGill | McGill International TB Centre

J.D. MacLean Centre for Tropical Diseases / Centre J.D. Maclean pour les Maladies Tropicales

Institut de recherche Centre universitaire de santé McGill | Research Institute McGill University Health Centre

Infectious Diseases and Immunity in Global Health Program
Programme en maladies infectieuses et immunité en santé mondiale

McGill | Institute of Parasitology

Faculty and speaker information is available in the Whova event app

McGill | McGill Summer Institute in Infectious Diseases and Global Health

Venue
Centre Mont-Royal
2200 Rue Mansfield,
Montréal, QC H3A 3R8

Day 1 Agenda
Monday, June 19

Time	
8.00AM	***Registration***
8.30-9.00AM	*Welcome, introductions, and goals*
9.00-10.00AM	Introduction to genomic epidemiology and microbiology basics M Behr
10.00-10.30AM	*Coffee Break*
10.30-11.15AM	Introduction to next-generation sequencing technology K Dewar
11.15AM-12.00PM	Bioinformatics methods I T Seemann
12.00-12.45PM	*Lunch*
12.45-1.30PM	Bioinformatics methods II T Seemann
1.30-1.40PM	Introduction to practical workshops R Lee
1.40-2.00PM	**Practical Exercises: Intro to Galaxy** T Seemann
2.00-2.30PM	*Coffee Break*
2.30-3.30PM	**Practical Exercises: WGS data quality** T Seemann
3.30-5.00PM	**Practical Exercises: WGS data quality** T Seemann
5.00-5.15PM	Summary of the day, goals for tomorrow and introduction to journal clubs
5.15PM	***Group Picture***
5.30-6.30PM	***Summer Institute Social*** **Venue:** Students' Society of McGill University (3480 rue McTavish, Montreal, QC, H3A 1X9) *Complimentary snacks and non-alcoholic drinks—Wine can be purchased with cash.*

Day 2 Agenda

Tuesday, June 20

Time	
9.00-9.30AM	Bioinformatics methods III T Seemann
9.30-10.00AM	Study design in genomic epidemiology R Lee
10.00-10.30AM	*Coffee Break*
10.30-11.15AM	Phylogenetics I A Goncalves da Silva
11.15AM-12.00PM	**Journal Club** R Lee, M Behr, T Seemann & A Goncalves da Silva
12.00-12.45PM	*Lunch*
12.45-1.30PM	Phylogenetics II A Goncalves da Silva
1.30-3.30PM *Coffee break included*	**Practical Exercises:** Mapping to a reference T Seeman
3.30-5.00PM	**Practical Exericses:** Building and interpreting a phylogenetic tree A Goncalves da Silva
5.00-5.10PM	Summary of the day, goals for tomorrow M Behr

Day 3 Agenda

Wednesday, June 21

Time	
9.00-9.30AM	Within-host diversity J Shapiro
9.30-10.00AM	Molecular clocks and dating A Goncalves da Silva
10.00-10.30AM	*Coffee Break*
10.30-11.15AM	Inferring transmission of *M. tuberculosis* J Gardy
11.15AM-12.00PM	**Practical Exercise:** Phylo trees, SNP matrices and epi data- inferring transmission and data visualization R Lee
12.00-12.45PM	*Lunch*
12.45-1.30PM	**Practical Exercise continued:** Phylo trees, SNP matrices and epi data- inferring transmission and data visualization R Lee
1.30-2.30PM	**Journal Club I** R Lee, M Behr, T Seemann & A Goncalves da Silva
2.30-3.00PM	*Coffee Break*
3.00-3.45PM	Applications of WGS to public health at BC CDC J Gardy
4.00-5.00PM	**Practical Exercise:** Transmission trees J Gardy
5.00-5.10PM	Summary of the day, goals for tomorrow R Lee

Day 4 Agenda

Thursday, June 22

Time	
9.00-9.30AM	Mechanisms for antimicrobial resistance M Behr
9.30-10.00AM	Genotyping- lab-based and *in silico* M Behr, R Lee
10.00-10.30AM	*Coffee Break*
10.30AM-11.15PM	Predicting antimicrobial resistance T Seemann
11.15AM-12.00PM	**Journal Club** R Lee, M Behr, J Gardy, T Seemann & A Goncalves da Silva
12.00-12.45PM	*Lunch*
12.45-1.30PM	Identifying plasmid-mediated outbreaks V Allen
1.30-3.30PM *Coffee break included*	**Practical Exercises:** Genotyping and antimicrobial resistance- gene presence / absence T Seemann
3.30-5.00PM	**Practical Exercises:** Antimicrobial resistance – SNPs R Lee
5.00-5.10PM	Summary of the day, goals for tomorrow M Behr
5.30-7.00PM	RESULTS Canada Wine and Cheese Reception Room TBA

Day 5 Agenda

Friday, June 23

Time	
9.00-9.30AM	Application of WGS to parasites G Matlashewski
9.30-10.00AM	GWAS E Schurr
10.00-10.30AM	*Coffee Break*
10.30-11.15AM	Incorporating WGS into the public health laboratory: Ontario's experience V Allen
11.15AM-12.00PM	**Journal Club** R Lee, M Behr, T Seemann & A Goncalves da Silva
12.00-12.45PM	*Lunch*
12.45-1.45PM	Summary Lecture R Lee
1.45-2.00PM	Course evaluations L Dery-Capes
2.00-3.30PM	Panel question and answer period (optional) All available instructors

Funders

USAID FROM THE AMERICAN PEOPLE

TB CARE II

Sponsors

Gold

Alere

Roche

Silver

Erba Molecular

TRANSASIA®
No.1 Diagnostic Company in India

Cepheid®
A better way.

Bronze

SIEMENS Healthineers

Fio Corporation®
Better data. Better care.

MERCK

DNA genotek

Partners

CCGHR CCRSM
Canadian Coalition for Global Health Research
Coalition canadienne pour la recherche en santé mondiale

PATH

IC-IMPACTS

MAYO CLINIC

HARVARD MEDICAL SCHOOL

Global Health Delivery Project at Harvard University

Global Health Strategies

FIND
Because diagnosis matters

ASLM
AFRICAN SOCIETY FOR LABORATORY MEDICINE

Grand Challenges Canada®
Grands Défis Canada

BWH BRIGHAM AND WOMEN'S HOSPITAL

TB ALLIANCE

Critical Path to TB Drug Regimens

Stop TB Partnership
TB REACH

nature REVIEWS
DISEASE PRIMERS

CICH
Centre for International Child Health

INTERNATIONAL SOCIETY FOR INFECTIOUS DISEASES

The International Diagnostics Centre

CLINTON HEALTH ACCESS INITIATIVE

RESULTS Canada