



**McGill**

McGill Summer Institute in  
Infectious Diseases and  
Global Health

MCGILL UNIVERSITY • MONTREAL • JUNE 18-22, 2018

# GENOMIC EPIDEMIOLOGY OF INFECTIOUS DISEASES

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Mon • June 18	Tues • June 19	Wed • June 20	Thurs • June 21	Fri • June 22
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



**MacLean Centre for Tropical Diseases**  
McGill University

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**

Interdisciplinary Initiative in Infection and Immunity

\*Faculty and speaker information is available in the *Ukhova* event app\*

# DAY 1 AGENDA

## MONDAY, JUNE 18

Time	
8:00AM	<b>Registration</b>
8:30-9:00AM	<i>Welcome, introductions, and goals</i>
9:00-10:00AM	Introduction to genomic epidemiology and micro/molecular biology basics M Behr
10:00-10:30AM	<i>Coffee Break</i>
10:30-11:15AM	Intro to next-generation sequencing technology M Behr
11:15AM-12:00PM	Bioinformatics methods I T Seemann
12:00-12:45PM	<i>Lunch</i>
12:45-1:30PM	Bioinformatics methods II T Seemann
1:30-1:40PM	Introduction to practical workshops R Lee
1:40-2:00PM	<b>Practical Exercises: Intro to Galaxy</b> T Seemann
2:00-3:00PM	<b>Practical Exercises: WGS data quality</b> T Seemann
3:00-3:30PM	<i>Coffee Break</i>
3:30-4:45PM	<b>Practical Exercises: Assembly</b> T Seemann
4:45-5:00PM	Goals for tomorrow and introduction to journal clubs R Lee
5:15PM	<i>Group Picture</i>
5:30-6:30PM	<i>Welcome Reception</i> Venue: Notman House (51 Sherbrooke St W, Montreal QC H2X 1X2) 10 min walk on Sherbrooke—Food and non-alcoholic drinks free. Alcoholic drinks for purchase.

# DAY 2 AGENDA

## TUESDAY, JUNE 19

Time	
9:00-9:30AM	Laboratory considerations for genomic epidemiology M Behr
9:30-10:00AM	Detecting contamination – Kraken T Seemann
10:00-10:30AM	<i>Coffee Break</i>
10:30-11:15AM	Phylogenetics I A Gonçalves da Silva
11:15AM-12:00PM	<b>Journal Club</b> M Behr, A Gonçalves da Silva, R Lee, I Levade, T Seemann
12:00-12:45PM	<i>Lunch</i>
12:45-1:30PM	Phylogenetics II A Gonçalves da Silva
1:30-3:30PM <i>Coffee break included</i>	<b>Practical Exercises:</b> Assessing for contamination, mapping to a reference T Seemann
3:30-5:00PM	<b>Practical Exercises:</b> Building and interpreting a phylogenetic tree A Gonçalves da Silva

# DAY 3 AGENDA

## WEDNESDAY, JUNE 20

Time	
9:00-10:00AM	Within-host diversity J Shapiro
10:00-10:30AM	<i>Coffee Break</i>
10:30-11:15AM	Molecular clocks and dating A Gonçalves da Silva
11:15AM-12:00PM	<b>Journal club</b> M Behr, A Gonçalves da Silva, R Lee, I Levade, T Seemann
12:00-12:45PM	<i>Lunch</i>
12:45-1:30PM	Making inferences about transmission and study design considerations in genomic epidemiology R Lee
1:30-5:00PM <i>Coffee break included</i>	<b>Practical Exercise:</b> Phylogenetic trees, SNP matrices and epi data - inferring (refuting) transmission, and data visualization R Lee

# DAY 4 AGENDA

## THURSDAY, JUNE 21

Time	
9:00-9:30AM	Mechanisms of antimicrobial resistance M Behr
9:30-10:00AM	How we currently predict antimicrobial resistance using genomic data T Seemann
10:00-10:30AM	<i>Coffee Break</i>
10:30AM-11:15AM	Metagenomics – analysis and applications J Shapiro
11:15-12:00PM	<b>Journal Club</b> M Behr, A Gonçalves da Silva, R Lee, I Levade, T Seemann
12:00-12:45PM	<i>Lunch</i>
12:45-1:30PM	<b>Practical Exercise: Predicting antimicrobial resistance</b> T Seemann
1:30-2:00PM	<b>Practical Exercise: Metagenomics (16S)</b> T Seemann
2:00-2:45PM	Other approaches for predicting resistance W Hanage
2:45-3:15PM	<i>Coffee Break</i>
3:15PM-4:00PM	Nanopore sequencing – applications L Cowley
4:00PM-5:00PM	<b>Practical Exercises: Working with nanopore data</b> L Cowley

# DAY 5 AGENDA

## FRIDAY, JUNE 22

Time	
9:00-9:45AM	Application of WGS to parasites G Matlashewski
9:45-10:00AM	<i>Course evaluations</i>
10:00-10:30AM	<i>Coffee Break</i>
10:30-11:15AM	Host-pathogen interaction E Schurr
11:15-12:00PM	Incorporating WGS into the public health laboratory: Ontario's experience V Allen
12:00PM-12:45PM	<i>Lunch</i>
12:45AM-1:45PM	<b>Panel discussion – the role (or potential role) of WGS in public health, research and clinical care</b> V Allen, L Cowley, C Frenette, W Hanage, T Lee
1:45-2:45PM	Course summary R Lee
2:45-3:30PM	Question and answer period / continue with practical exercises (optional) All instructors