McGill | McGill Summer Institute in Infectious Diseases and Global Health

Genetic and Molecular Epidemiology Course

McGill University, Montreal – June 20-24, 2016

Venue: **Chancellor Day Hall, McGill University**
3644 rue Peel (enter at 3660 rue Peel)
Montreal, QC, H3A 1W9
https://goo.gl/maps/kjZoj

COURSE SCHEDULE: OUTLINE

Day	Date	Time	Major themes
1	June 20, Mon	8.00 AM – 5.00 PM	Introduction to Population Genetics of Infectious Diseases
2	June 21, Tues	8.30 AM – 5.00 PM	Genetic Epidemiology of Infectious Diseases, Phenotype-Genotype Association Studies
3	June 22, Wed	9.00 AM – 5.00 PM	Molecular epidemiology of pathogens – technical considerations
4	June 23, Thur	9.00 AM – 5.00 PM	Molecular epidemiology of pathogens – applications
5	June 24, Fri	9.00 AM – 2.00 PM	Host-pathogen co-evolution

Hosts:

McGill | Global Health Programs | McGill International TB Centre / Centre international de TB McGill | 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

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PATH | Global Health Strategies | CCGHR CCRSM Canadian Coalition for Global Health Research / Coalition canadienne pour la recherche en santé mondiale | ASLM AFRICAN SOCIETY FOR LABORATORY MEDICINE

Day 1, June 20 [Monday]

Time	Lecture	Faculty
8.00 AM	Registration	
8.45 – 9.00 AM	Welcome, introductions, and goals	M Behr, E Schurr
9.00 – 10.00 AM	Genome Diversity and Population Demography	L Quintana-Murci L Barreiro
10.00 – 10.15 AM	Coffee	
10.15 – 12.15 PM	Inference on Natural Selection in Humans	L Quintana-Murci L Barreiro
12.15 – 1.15 PM	Lunch	
1.15 – 1.45 PM	Introduction to Practical Exercises	J Manry
1.45 – 4.30 PM Including coffee break	 Practical Exercises	J Manry V Fava L Quintana-Murci L Barreiro A Alcais E Schurr

Day 2, June 21 [Tuesday]

Time	Lecture	Faculty
8:30 – 9.15 AM	NextGenSequencing and Genetic Epidemiology	E Schurr
9.15 – 10.15 AM	Association I (case-control)	A Alcais
10.15 – 10.45 AM	Coffee and questions to lecturers	
10.45 – 11.45 AM	Association II (family-based)	A Alcais
11.45 – 12.30 PM	Introduction to Epigenetics	L Barreiro
12.30 – 2.00 PM	Lunch and questions	
2.00 – 2.30 PM	Introduction to Practical Exercises	V Fava
2:30 – 5.15 PM Including coffee break	 Practical Exercises	J Manry V Fava L Quintana-Murci L Barreiro A Alcais E Schurr
5.15 – 5.30 PM	Group picture	

Day 3, June 22 [Wednesday]

Time	Lecture	Faculty
9.00 – 9.10 AM	Introduction to molecular epidemiology	M Behr
9.10 – 9.50 AM	Long reads and *de novo* assembly	K Dewar
9.50 – 10.30 AM	Long reads for studying pathogenicity	M Behr
10.30 – 11.00 AM	Coffee	

11.00 – 11.40 PM	Short-reads and reference-based assembly	T Seemann
11.40 – 12.20 PM	What we can do with short-read data	T Seemann
12.20 – 1.30 PM	Lunch	
1.30 – 1.50 PM	Reference-based alignment for *M. tuberculosis*	R Lee
1.50 – 2.10 PM	Combining reference-based and *de novo* assembly approaches	I Levade
2:10 – 2:30 PM	Workshop overview / Q and A	M Behr R Lee
2.30 – 5.00 PM Including coffee break	 Practical Exercises	R Lee I Levade T Seemann

Day 4, June 23 [Thursday]

Time	Lecture	Faculty
9.00 – 9.40 AM	Origin and evolution of lassa virus	P Chen/J Shapiro
9.40 – 10.20 AM	Evolution and transmission of drug-resistant TB	S Gagneux
10.20 – 10.50 AM	Coffee	
11.00 – 11.40 AM	Determining a molecular clock: the how and the why	C Pepperell
11.40 – 12.20 PM	Global population genomics of *M. tuberculosis*	S Gagneux
12.20 – 1.30 PM	Lunch	
1.30 – 2.20 PM	Study design in molecular epidemiology	R Lee
2.20 – 5.00 PM Including coffee break	 Practical Exercises	R Lee I Levade T Seemann

Day 5, June 24 [Friday]

Time	Lecture	Faculty
9.00 – 9.40 AM	Pathogen specificity of host genetic control in mycobacterial infection	E Schurr
9.40 – 10.20 AM	Within host evolution	I Levade/J Shapiro
10.20 – 10.50 AM	Coffee	
10.50 – 11.40 AM	*M. tuberculosis* co-evolution with humans	S Gagneux
11.40 – 12.20 PM	Evolution of *M. tuberculosis* within and between hosts with TB	C Pepperell
12.20 – 12.40 PM	Course evaluations and closure	M Behr, E Schurr
12.40 – 2.00 PM	Lunch and departure	