



McGill  
Bioinformatics in Molecular Parasitology Workshop

Atelier de  
Bioinformatique en Parasitologie Moléculaire de McGill

**June 11-15, 2012**  
**Macdonald-Stewart Building,**  
**Macdonald Campus of McGill University**  
**21,111 Lakeshore Road**  
**St. Anne De Bellevue**  
**Québec, Canada H9X 3V9**



## **Course Coordinators**

Prof. John P. Dalton, Prof. Robin Beech & Prof. Reza Salavati

Institute of Parasitology, McGill University

## **Course Administrators**

Christiane Trudeau (christiane.trudeau@mcgill.ca)

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## **Course Teaching Assistants**

To be appointed

## **Sponsors**

Paravac (European Commission FP7)

Quebec Government MDEIE Program

Centre for Host Parasite Interaction (CHPI) Quebec

McGill University

# COURSE OUTLINE

- 1. Neutral model and theory of sequence change.** How molecular biology and Mendel's laws can help us to understand how DNA sequences change over time.
- 2. Sequence alignment.** Tracing the origin of two sequences back to a common ancestral sequence and how this is shown as an alignment between two sequences
- 3. Database searches (blast).** Searching sequence databases for matches that have an ancestor in common with a query sequence
- 4. Command line searches and essential unix.** Using basic unix commands to search with large query datasets and process the results from a blast search
- 5. Structure alignment and psi-blast.** Incorporating structure and function information to improve sequence alignments
- 6. Clustal Multiple Sequence Alignment.** Extending sequence alignments from two sequences to multiple sequences
- 7. Phylogenetic tree building.** Reconstructing the genetic origin and pattern of divergence among a set of DNA or protein sequences
- 8. Bootstrap and ML tree evaluation.** Statistical methods used to estimate the reliability of phylogenetic trees
- 9. Protein Structure, Modelling and Applications I.** Comparison of protein structures, classifications, and function.
- 10. Protein Structure, Modelling and Applications II.** Computational approaches to protein interaction prediction and functional assignment.

[Students will be encouraged to model the program around their own research projects]

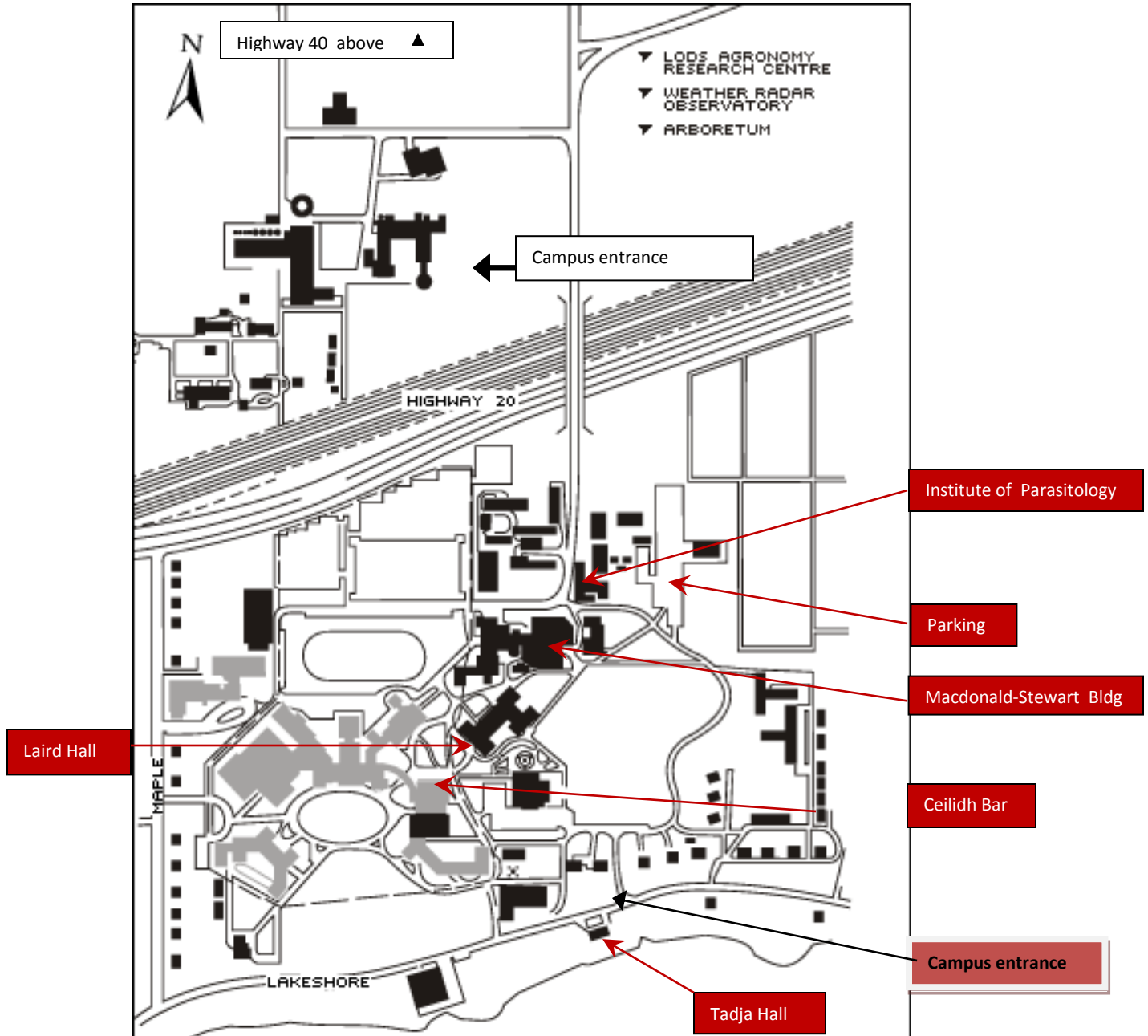


## DAILY Program

MONDAY TO FRIDAY, June 11<sup>th</sup> -15<sup>th</sup> 2012

- 08:00 - 09:00**            **BREAKFAST**  
(Tadja Hall).
- 09:15 - 10:15**            **BIOINFORMATICS CLASS**  
(Active Learning Centre, Macdonald-Stewart Bldg, MS2-028)
- 10:15 - 10:30**            **COFFEE BREAK**  
(Faculty Lounge, Macdonald-Stewart Bldg, MS2-022)
- 10:30 - 12.30**            **BIOINFORMATICS CLASS**  
(Active Learning Centre, Macdonald-Stewart Bldg, MS2-028)
- LUNCH**            **(Tadja Hall)**
- 02.00 - 03.00**            **BIOINFORMATICS CLASS**  
(Active Learning Centre, Macdonald-Stewart Bldg, MS2-028)
- 03.00 - 05.00**            **SUPERVISED CLASS/ASIGNMENTS/INDEPENDENT LEARNING.**
- 5.00 – 10.00**            **OWN TIME** (computer laboratory will be open to students until 10.00pm)

## Macdonald Campus Map



**Access by Highway 40 West from Montreal:** Take exit #44 Blvd Morgan (#41 for Ste Anne de Bellevue is closed); take right towards Blvd Morgan; at stop sign turn left and continue on Chemin Ste-Marie until you reach Chemin des Pins, and turn left at stop sign (Arboretum is on your right); you will cross the fields of the Macdonald Farm; at the stop sign turn left, go over the overpass and at the bottom you will see the Institute of Parasitology on your left and the Macdonald-Stewart Bldg across the street.

**Access by Highway 20 West from Montreal:** Take exit #39 Ste Anne de Bellevue; at lights turn left and continue on St-Pierre Street until Blvd Ste-Anne (one set of lights and 3 stop signs); at 3<sup>rd</sup> stop sign turn left and continue on this road (you are on Lakeshore Road) until you reach a large green sign indicating Macdonald Campus; turn left; at stop sign you can go left for the Ceilidh Bar or right to reach Macdonald-Stewart and the main buildings as well as the main parking lot.