



# MOLECULAR DIAGNOSTICS OF HONEY BEE PATHOGENS

4<sup>th</sup> Annual Workshop  
May 8-12, 2017

- Unique learning opportunity with leading bee researchers in a state-of-the-art molecular diagnostic lab
- First-hand experience at Canada's **National Bee Diagnostic Technology Access Centre** (NBDC-TAC) in Beaverlodge, Alberta
- Develop knowledge and skills for performing molecular diagnostics and laboratory research specific to bee pathogens

This workshop is designed for senior level undergraduate and graduate students with an interest in bee diagnostics, molecular biology, and laboratory/research techniques. Students will have the opportunity to work with bee scientists at the NBDC-TAC, develop specialized knowledge of bee pathogens, and use state-of-the-art equipment and techniques to develop their bee diagnostic skills in a small group setting.

## WORKSHOP DETAILS

- Participants:** Minimum 4, maximum 6 students with some laboratory experience
- Instructors:** Carlos Castillo, PhD. - NBDC-TAC applied scientist  
Patricia Wolf Veiga, MSc. - NBDC-TAC diagnostic technician  
Jamie Lee Martin, BSc. - NBDC-TAC laboratory technician  
Stephen Pernal, PhD. (AAFC's lead honey bee scientist) special lecture
- Methodology:** Students will be paired based on complementary laboratory skills. The groups will rotate in the lab to prepare samples and perform diagnostics. Instructors will guide students through all the procedures (field and lab work) covered in the course. There will be three - 45 minute lectures on molecular biology techniques, and one - 60 minute special lecture on honey bee pathogens. Students will present and discuss their diagnostic results on Friday afternoon, and provide an evaluation of the course.
- Tuition/Costs:** **\$1,200 tuition** includes instruction, lab materials and supplies. Travel & accommodation are the students' responsibility.

## PROPOSED WORKSHOP SCHEDULE

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Course overview & Introductions	Nucleic acids & PCR based diagnostics (L)	Real-Time PCR diagnostics (L)	African genetics in Western honey bees (L)	Sperm count & viability (LW)
Honey bee pathogens (L)	RNA extraction (LW)	DNA extraction (LW)	qPCR detection and quantification of bee viruses (LW)	Gel electrophoresis & imaging (LW)
Colony inspection & bee sampling (FW)	Nosema count (LW)	cDNA conversion (LW)		
<b>LUNCH</b>				
Sample preparation (LW)	DNA extraction (LW)	PCR detection of <i>Nosema</i> & EFB (LW)	Gel electrophoresis & imaging (LW)	AFB evaluation (LW)
AFB plating (LW)	Varroa washes (LW)	Other honey bee pests: SHB, wax moth, <i>Vespa velutina</i> (D)	Africanization PCR & restriction enzyme digestion (LW)	Results & discussion
AFB resistant test (LW)	Tracheal mites detection (LW)			Workshop evaluation

**L:** Lecture

**FW:** Field work

**LW:** Lab work

**D:** Demonstration

**Morning:** 9:00 h-12:00 h

**Lunch:** 12:00 h-13:00 h

**Afternoon:** 13:00 h-17:00 h

## ADDITIONAL INFORMATION

**Location & Context:** Alberta is the 3<sup>rd</sup> largest honey producer in North America with both honey production and pollination operations. The Peace Region is known for world-class quality honey and large scale commercial beekeeping.

**Beaverlodge, Alberta** is located 40 km west of Grande Prairie. Agriculture & Agri-Food Canada's **Beaverlodge Research Farm** is the nationally designated site for honey bee research.

Grande Prairie Regional College's **National Bee Diagnostic Centre - TAC** is co-located on the Research Farm and is the only laboratory in Canada dedicated exclusively to bee diagnostics.

Check us out: <https://www.gprc.ab.ca/research/initiatives/nbdc/index.html>

**Grande Prairie** is 450 km northwest of Edmonton. With a population of 60,000+, the city is economically vibrant and young—the average age is 28. Primary industries are oil, gas, forestry and agriculture.

**Grande Prairie Regional College**, with campuses in Grande Prairie and Fairview, offers a wide range of university and vocational programs.

### **Travel & Accommodations**

- Workshop participants are responsible for travel to Grande Prairie. Both Air Canada and WestJet have daily flights in and out of Grande Prairie from/to Edmonton and Calgary.
- GPRC will provide daily transportation to the NBDC-TAC laboratory in Beaverlodge for any participants with accommodations in Grande Prairie.
- Participants are responsible for their own accommodations. Options include:
  - a) GPRC residence <https://www.gprc.ab.ca/services/housing/gphousing.html>
  - b) Hotel: Service Plus Inn, directly across the street from GPRC, offers a preferred rate to College visitors. <http://www.serviceplusinns.com/grande-prairie-hotels.html>.
  - c) There are several other hotels at walking distance from the College.
  - d) Private accommodation or hotel in Beaverlodge if preferred.

### **Arrival & Departure**

Participants are asked to arrive the day before on Sunday, May 7.

On Monday, May 8 a minivan leaves GPRC Theatre entrance at 8:20 AM for travel to Beaverlodge. The workshop will end Friday, May 12, at 5 PM. You will be back in Grande Prairie by 5:45 and you may be dropped off at the airport, if required for your flight.

### **Meals**

Participants are responsible for their own meals.

Generally, breakfast and dinner will be on your own and lunch in Beaverlodge.

### **Amenities & Opportunities in Grande Prairie**

In addition to stores and services, Grande Prairie has a wide range of options for active living:

- GPRC fitness centre <https://www.gprc.ab.ca/departments/peak/fitness/fitnesscentre.html>
- Eastlink Recreation Centre <http://www.cityofgp.com/index.aspx?page=1599>
- Art Gallery of Grande Prairie <http://aggp.ca/>
- Bear Creek Trails <http://www.cityofgp.com/index.aspx?page=497>



NBDC-TAC Laboratory

**REGISTRATION** Complete and return the registration form **BEFORE April 7, 2017.**

This workshop is limited to 6 participants. Registration is on first come/first qualified/first admitted basis. Attach an updated resume emphasizing your laboratory experience and include a paragraph on why you are interested in this workshop.

**CONTACT** GPRC – Continuing Education – Registration Assistance  
Phone: 1-780-539-2975 Toll Free: 1-888-539-4772

[ce@gprc.ab.ca](mailto:ce@gprc.ab.ca)

**4<sup>TH</sup> HONEY BEE DIAGNOSTIC WORKSHOP: MAY 8-12, 2017**  
**REGISTRATION FORM**

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**NAME**

First (legal)

Middle (legal)

Last/Family

Birthdate (yy/mm/dd)

**ADDRESS**

Street

City/Town

Province

Postal Code

**CONTACT**

Email

Phone (home)

Phone (business)

Cell

**ACADEMIC INFORMATION**

University/College

Department/School

Program

Specialization

Year

**RESIDENCY STATUS** (Check one)

Canadian Citizen

Permanent Resident/Landed Immigrant

Study Permit

Other VISA

**SPONSOR INFORMATION**

Name/Institution

Department

Department Chair/Faculty sponsor

**PAYMENT METHOD –Tuition: \$1200** (Check one)

VISA

Mastercard

American Express

Card #

Expiry Date

Cardholder's Name:

Cheques payable to Grande Prairie Regional College NBDC-TAC

**Mail to:** Attention: Finance

10726 106 Ave, Grande Prairie Alberta T8V 4C4

**ATTACHMENTS**

Letter of sponsorship

Resume/CV + written explanation of your interest in this workshop

**Protection of Privacy:** the personal information requested on this form is collected under the authority of the Alberta Freedom of Information and Protection of Privacy (FOIP) Act for authorized purposes including admission and registration, administration of records, scholarship and awards, student services, and college planning and research. Student personal information may be disclosed to academic and administrative units according to College policy, provincial and federal reporting requirements, information sharing agreements and to contracted services as required. BY THE ACT OF APPLYING TO THIS WORKSHOP, EACH STUDENT AGREES TO BE BOUND BY THE POLICIES AND PROCEDURES OF GPRC.

**STUDENT**

Signature \_\_\_\_\_ DATE: \_\_\_\_\_