Hands-on molecular approaches for honey bee research in health and disease

May 27 to June 1st, 2024

Instituto de Investigaciones Biológicas Clemente Estable (IIBCE). Avda. Italia 3318, Montevideo, Uruguay

Programme

Honey bees are the most commonly managed pollinators worldwide, essential for wild plant reproduction, crop production, food security and the maintenance of healthy ecosystems. However, bees are under threat. During the last 15 years, large scale honey bee colony losses have been reported worldwide. Land use intensification associated to a decrease in diversity and availability of pollen, intoxication with pesticides and infection by multiple pests and pathogens, have been associated with those losses.

This 6-days intensive postgraduate course will cover basic aspects related to honey bee health and disease, focusing on the main pests and pathogens that affect them, as well as the role of gut microbiota. We will also discuss different methodologies commonly used for its study, from basic molecular biology approaches to cutting-edge techniques, such as microbiomics, viromic and transcriptomic.
The course will include lectures, workshops, laboratory sessions, presentations of students and introduction to bioinformatic and statistical analysis.

Audience

The target audience is postgraduate students from MSc and PhD programs from different Latin American countries. Students can apply for fellowships to cover air tickets, accommodation and meal.

Local Organizing Committee

Dr. Karina Antúnez, IIBCE, Montevideo, Uruguay
Dr. Daniela Arredondo, IIBCE, Montevideo, Uruguay
Dr. Loreley Castelli, IIBCE, Montevideo, Uruguay
Dr. Diego Vázquez, IIBCE, Montevideo, Uruguay
Dr. Belén Branchiccela, INIA, Uruguay
Dr. Ciro Invernizzi, Facultad de Ciencias, Uruguay

Invited professors

Dr. Jay Evans, Bee Lab, Department of Agriculture of the USA
Dra. Yanina Panzera, Facultad de Ciencias, Uruguay
Dr. Marisol Vargas, Universidad de Concepción, Chile
Dr. Andrés Cañedo, Universidad Federal do Pampa, Brazil.

Registration
Complete the form at https://forms.gle/7ZH7DcZtL4soU5XM7 attaching a CV, academic record, a motivation letter, and tutor endorsement letter.

Deadline April 1st, 2024.

Contact: cursoabejas2024@gmail.com

Preliminary schedule

Monday 27, May	
09:00 - 09:30hs	Welcome by Local Organizing Committee.
09:30 - 10:30hs	Elevator Pitch from students
11:00 - 12:00hs	Organization and behavior of honey bees
12:00 - 13:00hs	Honey bee pest and pathogens
13:00 - 14:00hs	*Lunch*
14:00 - 15:00hs	Honey bee gut microbiota
15:00 - 18:00hs	**Workshop: Rearing of larvae and adult bees under laboratory conditions for their use as experimental models**
Tuesday 28, May	
9:00-10:00hs	PCR and qPCR for pathogen detection and quantification. Ex. Detection of *Paenibacillus larvae* by PCR; *Nosema apis* and *Nosema ceranae* by multiplex PCR and RNA viruses by qPCR.
10:00-11:00hs	Detection of viral replication on honey bees and *Varroa destructor*
11.00-13:00hs	Markers genes to monitor the sanitary status of honey bee colonies
13:00-14:00hs	*Lunch*
14:00-18:00hs	**Practical work (to choose between activities 1, 2 or 3)**
Wednesday 29, May	
09:00-11:00hs	Basic concepts of High throughput sequencing (HTS)
11:00-13:00hs	Use of oomics tecnhologies for studying honey bee health
13:00-14:00hs	*Lunch*
14:00-18:00hs	**Practical work (continuation of activities 1, 2 or 3)**
Thursday, 30, May	
09:00-11:00hs	Use of HTS for analysis of honey bee viromes
11:00-12:00hs	Use of HTS for analysis of honey bee gut microbiota
12:00-13:00hs	Use of HTS for analysis of honey bee transcriptomic
13:00-14:00hs	*Lunch*
14:00-18:00hs	**Practical work (to choose between activities 4 or 5)**
Friday 31, May	
09:00-13:00hs	**Practical work (continuation of activities 4 or 5)**
13:00-14:00hs	*Lunch*
14:00-18:00hs	**Practical work (continuation of activities 4 or 5)**

Saturday 1, June	
9:00-13:00hs	**Workshop 2: Methodological approaches using honey bee colonies under field conditions.**
13:00hs	Closure

Practical activities

1	Detection of *Nosema apis* and *Nosema ceranae* by mltiplex PCR
2	Detection of DWV by qPCR
3	Quantification of bacteria by qPCR
4	Next-generation sequencing data analysis: Analysis of viromes
5	Next-generation sequencing data analysis: Analysis of microbiota