Universitat Autònoma de Barcelona

2017/2018

Laboratory VI

Code: 101942
ECTS Credits: 3

Degree	Type	Year	Semester
2500890 Genetics	OB	3	2

Contact

Name: Alba Hernández Bonilla
Email: Alba.Hernandez@uab.cat

Use of languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Prerequisites

- It is mandatory to have taken -o being currently taking- the theoretical subjects related to the experimental work developed here.
- Biosecurity and security tests at 'campus virtual' need to be passed. The student must prove knowledge and acceptance of the Bioscience laboratory guidelines.
- It is necessary to go through the theoretical content of each module before the day of the practical classes.
- Wearing a lab coat is mandatory. It is not possible to enter to the lab without a lab coat.
- Attendance is mandatory.
- Students should come to the class following the assigned schedule. Changes in the original schedule need to be approved by the corresponding professor and in all cases before the starting of the classes.

Objectives and Contextualisation

The Integrated Laboratory VI is the sixth course in a set of 6 which are distributed along 6 semesters of the first three courses of the degree of genetics. These subjects aim to give a solid foundation of experimental procedures, techniques and skills of genetics and related sciences. The practical work help to reinforce the theoretical concepts acquired in the theory, and allow us to understand the essential dialogue between theory and experimentation that have given rise to the body of knowledge that constitutes the science of genetics.

The Integrated Laboratory VI has as objectives the acquisition of experimental skills in 3 specific modules of content:

- Molecular genetic diagnostic
- Evolution
- Systems Biology

Module of Molecular genetic diagnosis

The main objective of the module is to know and apply some of the basic techniques of molecular genetics in the diagnosis of diseases.

Module of Evolution

The purpose of the module is learn how to estimate the genetic variation and infer the evolutionary potential. Also, to understand the phenotypical consequences of selection, and recognize the important practical applications of biological evolution in fields such as health or agricultural economy. Through these practices, the student will acquire skills in the application of analytical techniques in biological and molecular data.

Module of Systems biology

The main objective of the module is to learn how to use the right software in systems biology and better understand the behavior of biological systems. To achieve this the student will conduct simulation exercises with computer to see how the behavior of a biological system cannot be predicted from the behavior of its isolated components.

Content

Module of Molecular genetic diagnostic

The main objective of the molecular genetic diagnosis module is to know and apply some of the basic techniques of molecular genetics in the diagnosis of diseases.

Module of Evolution

(a) genetic variation and evolutionary potential. Estimate values of heritability and its relationship with the evolutionary potential in natural populations.

(b) natural selection and selection modes. Using data on survival and phenotypic traits, estimate the modes of selection and phenotypic distributions before and after a selective event.

(c) genetic variability and population structure. Estimate the genetic variability among different populations and assess if there is differentiation between them.

(d) evolutionary relationships and phylogenies. Estimate genetic distances between taxa and construct phylogenetic trees that describe their evolutionary relationships.

(e) evolutionary applications. Study how evolutionary biology is applied in the daily activities and its impact on areas such as health and agricultural economy.

Module of systems biology

The module includes practical exercises corresponding to the theory of the subject ' systems biology ' and will consist in the simulation of systems for example corresponding to genetic, metabolic networks, signal transmission or of more complex systems, developed by the student with the recommended software or downloaded from databases of models according to the case.

In general the practices include exercises for the use of software and databases specific to each of the topics. These exercises will allow