Universidad Zaragoza

Academic Year/course: 2023/24

27127 - Animal Biotechnology

Syllabus Information

Academic year: 2023/24
Subject: 27127 - Animal Biotechnology
Faculty / School: 100 - Facultad de Ciencias
Degree: 446 - Degree in Biotechnology
ECTS: 6.0
Year: 4
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

The objectives of this subject are to introduce the student to the basic techniques of reproductive biotechnology, to the knowledge of germ cells and their applications, and to familiarize the student with the basics of germ cell transfer gene therapy between organisms.

These goals are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/) : Goal 2: Zero Hunger; Goal 3: Health and wellness; Goal 4: Quality education; Goal 5. Gender equality; Goal 8: Decent Work and Economic Growth; Goal 9: Industry, innovation and infrastructure; Goal 11: Sustainable cities and communities; Goal 12: Responsible production and consumption ; Goal 15: Life of terrestrial ecosystems.

2. Learning results

1. Recognition and manipulation of germ cells for biotechnological application.
2. Knowledge of the basis of gene transfer, its modalities and applications.
3. Preparation of reports related to the subject.
4. Writing and oral presentation of papers based on bibliography related to the subject.

3. Syllabus

Theoretical classes:

Block I: Reproductive biotechnology: Gamete procurement, gamete preservation and embryo production

Block II: Transgenesis: Fundamentals, methods and applications. Types of gene constructs. Genomic editing. Genetically modified animals. Phenotype and role of the genetic substrate.

Block III: Gene therapy: Basis and forms of action. Most commonly used types of vectors, candidate diseases.

Importance of gene therapy in the field of biotechnology.

Practical classes:

1. Semen collection and evaluation of semen quality.
2. Freezing of gametes (spermatozoa).
3. Swim-up and/or zona pellucida binding assay (depending on sample availability).
4. Gene therapy experience approach.

4. Academic activities

Lectures: sessions with the teacher in which the syllabus will be explained: 40 hours.

Practical classes: Practices 1-3 will be carried out in the Biochemistry and Biology laboratory of the Faculty of Veterinary Medicine.

Practice 4 will be carried out in the *Aula Informática* of the Faculty of Veterinary Medicine. Face-to-face and mandatory. 10 hours.

Seminars: The seminars will be organized in 1-hour sessions and will consist of the selection of a genetically modified animal and its presentation. Face-to-face and mandatory. 10 hours.

5. Assessment system

The subject will be assessed by the continuous assessment system by means of the following activities:

1. A written test of multiple-choice questions. Each correct answer will be credited with 1 point. In order to pass, it is necessary to reach 60% of the total content of the exam. The result of the evaluation of the written test will account for 75% of the final

grade.

2. The 25% of the final grade will be achieved by the attendance to the laboratory practices together with the evaluation of the seminar presentations as long as the student has obtained a grade higher than 4.5 in the written test.

Those students who in previous calls have exceeded 50% of the corresponding grade in any of the training activities will not be required to repeat those activities.

In addition to the assessment system indicated in the previous items, the student will have the possibility of being assessed by a global test, which will judge the achievement of the learning results indicated above To pass the subject it is necessary to obtain a minimum of 6 points out of 10 in the global test grade.