Universitat Autònoma de Barcelona

2018/2019

Genetics and Reproduction

Code: 101891
ECTS Credits: 3

Degree	Type	Year	Semester
2501230 Biomedical Sciences	OT	4	0

Contact

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Use of languages

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

Teachers

Joan Blanco Rodríguez

Prerequisites

There are no prerequisites for taking this course, however to ensure the achievement of the learning aims, it is recommended to:

1. Have an appropriate knowledge of subjects completed in previous courses: "Cell Biology and Histology", "Genetics" and "Cytogenetics".
3. Have an appropriate knowledge of the techniques used in these disciplines.
4. Have a basic knowledge of the use of computer tools (Internet, Powerpoint, and word processors)

5. Have a good English reading comprehension

Objectives and Contextualisation

Sexual reproduction in most species is associated to sex dimorphism and the presence of chromosomes that determine sex. Sex dimorphism is achieved through the participation of specific genes involved in a differential sex development. Mutations in these genes influences normal sex differentiation and therefore reproduction. On the other hand, gametogenesis are complex and highly regulated processes. Dysfunctions or anomalies that affect one or more stages involved in the formation of sperm or oocytes can impair the reproductive capacity of the individuals affected.

The genetic contribution to fertility problems is difficult to assess. Up to date, it has been stablished the relationship between several genotype alterations and their effect on the reproductive capacity of the affected individuals. However, except for few diseases (for example cystic fibrosis), these patients do not exhibit any relevant phenotypic traits. In general, the manifestation of infertility of genetic origin is related to a significant reduction in the number of gametes produced, anomalies in embryo development or spontaneous abortions.

In this context, the objectives will focus on:

1. To stablish genetic causes conditioning reproduction in humans.

2. To provide updated knowledge about assisted reproductive techniques and the applications of in vitro handling of gametes and embryos.

3. To determine the risk of transmission to the offspring.

4. To establish the basis for reproductive genetic counselling

Content

SECTION I: GENETIC BASIS OF REPRODUCTION
Topic 1. Sex determination and differentiation in humans
Topic 2. Genetic control of human gametogenesis

SECTION II: GENETIC BASES OF INFERTILITY
Topic 3. Genetic basis of male infertility
Topic 4. Genetic basis of female infertility

SECTION III: GENETIC DIAGNOSIS AND ASSISTED HUMAN REPRODUCTION
Topic 5. Assisted Reproduction Techniques (TRAs)
Topic 6. Risks of Assisted Reproduction Techniques
Topic 7. Genetic analysis of gametes
Topic 8. Preimplantation genetic diagnosis
Topic 9. Prenatal genetic diagnosis
Topic 10. Reproductive genetic counseling