

Molecular Histopathology: from Laboratory to Clinic

Code: 103638
ECTS Credits: 3

Degree	Type	Year	Semester
2502442 Medicine	OT	3	0
2502442 Medicine	OT	4	0
2502442 Medicine	OT	5	0
2502442 Medicine	OT	6	0

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

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

Carmen Blazquez Maña
Rubén Carrera Salas

Prerequisites

It is necessary for the student to assimilate basic skills in Biochemistry and Molecular Biology and also in Physiology and Pathology.

Objectives and Contextualisation

The subject aims to introduce the student to the clinical applications of Molecular Pathology, both from the point of view of diagnosis, and in the detection of molecular alterations of predictive interest in personalized oncological treatments.

Competences

Medicine

- Demonstrate an understanding of the fundamentals of action, indications, efficacy and benefit-risk ratio of therapeutic interventions based on the available scientific evidence.
- Demonstrate basic research skills.
- Demonstrate understanding of the basic sciences and the principles underpinning them.
- Demonstrate understanding of the mechanisms of alterations to the structure and function of the systems of the organism in illness.

- Demonstrate understanding of the organisation and functions of the genome, the mechanisms of transmission and expression of genetic information and the molecular and cellular bases of genetic analysis.
- Indicate the basic diagnosis techniques and procedures and analyse and interpret the results so as to better pinpoint the nature of the problems.
- Write patient records and other medical documents that can be understood by third parties.

Learning Outcomes

1. Analyse information from biological sequencing.
2. Correctly write reports on the results of different types of tests (analytic, genetic).
3. Demonstrate basic research skills.
4. Describe the diagnosis, prognosis, prevention and treatment for the most common genetic pathologies in the human population.
5. Describe the indications of anatomopathological tests.
6. Describe the molecular basis of the mechanisms underlying anatomopathological alterations of various diseases, primarily neoplastic and hereditary ones, in different body systems.
7. Identify the concept of medical bioinformatics and the integration of genetic and clinical databases.
8. Identify the most efficient tests for prevention, diagnosis and control of treatment for the most common human pathologies.
9. Relate genetic dysfunction to the pathological phenotype.

Content

Specialized seminars (15 hours)

Seminar 1

Applied molecular biology (introduction to the primary structure of nucleic acids, higher structures and condensation of DNA, cell cycle and organization of the eukaryotic genome, replication and transcription, genetic code and mechanisms of translation regulation).

Seminar 2

Diagnostic molecular pathology in colorectal and gastric neoplasms

Seminar 3

Diagnostic molecular pathology in lymphoid neoplasms

Seminar 4

Diagnostic molecular pathology in lung neoplasms

Seminar 5

Diagnostic molecular pathology in gynecological and breast neoplasms

Seminar 6

Introduction to basic techniques

Seminar 7

Hybridization techniques: Basics. Conventional cytogenetics techniques. FISH (probe types, CEP / LSI / WCP, hybridization strategies: Dual-Color Break-Apart, Dual-Color Dual-Fusion; amplification probes). CISH. SISH. CGH.

Seminar 8

PCR based techniques (I).

Seminar 9

PCR based techniques (II)

Methodology

For the 2019-2020 academic year, the professor designated by the Department as responsible for the subject at the Faculty level is:

UDPT

Francisco Javier Andreu
xandreu@tauli.cat
(12 students)

The students, divided into groups of 3 or 4 students, will face real clinical problems that they will have to develop from the initial diagnostic material (paraffin block), through the DNA extraction and quantification method, PCR / hybridization, and sequencing , until the issuance of the molecular pathology report.

The selected cases of the pathology file may include mutational study of lung and colon cancer, study of a family with suspected HNPCC (Lynch syndrome) or diagnosis of limfoproliferatiu process, among others.

In the current exceptional circumstances, at the discretion of the teachers and also depending on the resources available and the public health situation, some of the theoretical classes, practicals and seminars organized by the Teaching Units may be taught either in person or virtually.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Specialized Seminars (SESP)	15	0.6	
Type: Supervised			
Assistencial practicum without guidelines	15	0.6	
Type: Autonomous			
Personal study, bibliography consultation, problem solving, work accomplishment	41	1.64	1, 3, 4, 6, 5, 7, 8, 2

Assessment

The marks for the final qualification of the subject will be:

- The resolution of problems in class (30% of the final grade)
- Completing a written test questionnaire (30% of the final grade). Assessment will take into account the qualification of the presentation and the attitude in class. The non-active participation in the presentation of the corresponding presentation will prevent the qualification of this part of the subject.

- The evaluation of the work (40% of the final grade). The student will have to make a presentation on the case that will have developed during the intensive practice.

Students who fail to carry out both theoretical and practical evaluation tests will be considered as Not evaluated by exhausting the rights to the matriculation of the subject.

Recovery system:

For students who have not passed the subject through the scheduled assessment activities, they can participate in an oral recovery test, according to the programmed exam calendar.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Delivery of work / reports	40%	1	0.04	1, 3, 4, 6, 5, 7
Evaluation through practical cases and problem solving in class	30%	1	0.04	6, 5, 8, 2, 9
Written test questionnaire	30%	2	0.08	6, 5

Bibliography

Specific bibliography

Molecular biology and genetic engineering. Luque J, Herráez A. Ed. Elsevier Science, Madrid, 2002.

Lliçons de Molecular Pathology. González Sastre F, Guinovart JJ. Ed. Springer-Verlag Ibérica, Barcelona, 2000.

Molecular Biology of the Gene (2006) Watson et al. Editorial Panamericana.

Reference bibliography

Molecular Biology of the Cell. Alberts B. Ed. Omega, Barcelona 2010.

Internet resources

<http://www.sanger.ac.uk/genetics/CGP/cosmic/>

www.ncbi.nlm.nih.gov/pubmed

www.ncbi.nlm.nih.gov/omim

<http://www.hgvs.org/mutnomen/>