

Advances in Clinical Biochemistry and Molecular Pathology

Code: 42886
ECTS Credits: 9

2025/2026

Degree	Type	Year
Bioquímica, Biología Molecular y Biomedicina	OP	1

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Teachers

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(External) Madalina Nicoleta Nan

(External) Mireia Tondo Colomer

(External) Noemí Rotllan Vila

Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

- 1) Having the Degree, preferably in Life Sciences and Health (Biomedicine, Biochemistry, Genetics, Medicine, Veterinary Medicine, Pharmacy, etc.)
- 2) Good level of Spanish, and English. Spanish will be used as we do have students from other parts of Spain and South America. English will be used for sure for reading scientific information.

Objectives and Contextualisation

The main objective of the module is reviewing the progress recently made by the speciality of Clinical Biochemistry and Molecular Pathology. It is intended, therefore, that students visualize this using examples, that are not intended to be exhaustive. The goal is that they understand how some applications in this area of Laboratory Medicine were generated and applied. The contents will be selected among those advances which, although recent, have proven of practical importance. The theoretical instruction is supplemented by expert seminars, discussion of articles and resolution of clinical cases.

Learning Outcomes

1. CA20 (Competence) Devise projects associated with the emerging challenges for clinical biochemistry and molecular pathology in industry and medicine.
2. CA21 (Competence) Work as a team to address and solve problems and case studies associated with emerging challenges in clinical biochemistry and molecular pathology.
3. KA28 (Knowledge) Identify advances in molecular biology techniques for application in the clinical laboratory and in the biochemical diagnosis of cardiovascular diseases in emergency contexts.
4. KA29 (Knowledge) Enumerate advances in the biochemical study of renal function in lipoprotein metabolism, dyslipidemia and arteriosclerosis.
5. KA30 (Knowledge) Identify current issues in molecular biology research within the fields of clinical biochemistry and molecular pathology.
6. SA28 (Skill) Relate scientific and technological knowledge acquired in the fields of clinical biochemistry to molecular pathology.
7. SA29 (Skill) Correctly apply the biochemical and genetic analyses that are performed in clinical laboratories based on their characteristics and special requirements.

Content

M9

PRESENTATION. POTENTIAL ACADEMIC AND PROFESSIONAL OUTCOMES IN CLIN BIOCH AND MOL PATHOL

UPDATE EN LIPIDS AND LIPOPROTEINS (topic 1)

STANDARDIZATION AND QUALITY (topic 2)

Standardization and quality

Standardization and quality (questions relative to topic 2)

SEMINAR I. Mass spectrometry: bases and clinical applications

INBORN ERRORS OF METABOLISM (topic 3)

CLINICAL BIOCHEMISTRY OF THE ADRENAL CORTEX (topic 4)

PRENATAL SCREENING (topic 5). Questions relative to topics 3, 4 and 5 (second part)

ONCOLOGY (topic 6): Diagnosis of inherited cancer / Detection of plasma free tumoral DNA

ONCOLOGY: Tumor Markers. Discussion of clinical cases and/or papers, questions relative to topic 6

BIOCHEMICAL MARKERS OF CARDIAC DAMAGE (topic 7). Biochemical diagnosis of acute myocardial infarction. Bioche

SEMINARS II-III. Animal models animals of arteriosclerosis / Molecular and Cellular Biology of arteriosclerosis

SEMINARS IV-V- MicroRNAs en cardiovascular research / Questions relative to topics 1, 7 and seminars (second part)

BIOCHEMICAL DIAGNOSIS OF ALZHEIMER'S DISEASE AND OTHER NEUROLOGICAL DISEASES (topic 8).

CLOSING CONFERENCE: Molecular bases of complex diseases

Presentation of scientific papers or clinical cases by the alumni

Presentation of scientific papers or clinical cases by the alumni

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
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Type: Directed			
theoretical lessons, seminars, aula practicum: 45 h	7.5	0.3	
theoretical lessons, seminars, aula practicum: 45 h	15	0.6	
theoretical lessons, seminars, aula practicum: 45 h	22.5	0.9	
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Type: Supervised			
Study of clinical cases and reading scientific papers for class discussion: 67.5 h	67.5	2.7	
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Type: Autonomous			
Study: 106.5 h	106.5	4.26	
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Methodology includes autonomous activities (studying: 106.5 h), supervised activities (study of clinical cases and reading scientific papers for class discussion: 67.5 h) and directed activities (theoretical lessons, seminars, aula practicum: 45 h).

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attendance and active participation in classes	30%	0	0	CA20, CA21, KA28, KA29, KA30, SA28, SA29

Oral presentation of projects or clinical cases	40%	4	0.16	CA20, CA21, KA28, KA29, KA30, SA28, SA29
Presentation of homework and reports, small exams of short questions (in writing)	30%	2	0.08	CA20, CA21, KA28, KA29, KA30, SA28, SA29

Unique evaluation will not be applied.

The continuous evaluation process must include a minimum of three evaluation activities, of two different types, distributed throughout the course, none of which can represent more than 50% of the final grade

The evaluation will be based on: oral presentation of projects or clinical cases analysis (40% of the grade), presentation of small works and reports, as well as the answer to short exams (30% of the grade) and attendance to class and active participation (30 % of the grade)

Students who do not perform both theoretical and practical tests will be considered as "not presented", therefore exhausting the rights of the registration.

If plagiarism is detected in any of the works delivered, this may mean that the student suspends the entire module or subject.

PROOF OF RECOVERY AND QUALIFICATION OF NOT EVALUABLE

To participate in exam recovery, students must have been previously evaluated in a set of activities, whose weight equals a minimum of 2/3 parts of the total grade of the subject or module. Therefore, the students will obtain a "Not Evaluable" qualification when the evaluation activities carried out have a weight lower than 67% of the final grade.

Bibliography

TEXTBOOKS:

1) Tietz textbook of Clinical Chemistry and Molecular Diagnostics. Burtis CA, Ashwood ER, Bruns DE eds. Elsevier, 2014.

2) Molecular Basis of Inherited Disease. Valle, Beaudet, Vogelstein et al. Saunders 2001 (digital edition with timely actualization: <https://ommbid.mhmedical.com/ommbid-index.aspx>).

SCIENTIFIC JOURNALS (Some of these journals allow public or limited access through internet, or through the UAB website*):

1) Clinical Chemistry. <http://search.ebscohost.com/direct.asp?db=ccm&jid=%2210CS%22&scope=site>

2) Clinica Chimica Acta, <https://www.sciencedirect.com/science/journal/00098981>

3) Clinical Biochemistry, <https://www.sciencedirect.com/science/journal/00099120>

4) Circulation,

<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&MODE=ovid&NEWS=n&PAGE=toc&D=ovft&AN=00003017-00000000>

5) Blood, <https://ashpublications.org/blood/issue-covers/volume/>

6) Journal of Lipid Research, <http://www.jlr.org/>

7) New England Journal of Medicine, <http://www.nejm.org/>

8) Lancet, <http://search.ebscohost.com/direct.asp?db=ccm&jid=%22LAN%22&scope=site>

9) Journal of Clinical Investigation, <http://www.jci.org/>

1) Cell Metabolism, <http://www.cell.com/cell-metabolism/redirectUrl/>

12) Nature Medicine, <http://www.nature.com/nm/index.html>

14) Cancer Research, <http://cancerres.aacrjournals.org/>

*For more information, go to the digital UAB library M9 page:

https://catalegclassic.uab.cat/search~S1*spi?/pBLANCO+VACA%2C+FRANCISCO/pblanco+vaca+francisco/-3%

SCIENTIFIC CLINICAL LABORATORY SOCIETY WEBSITES:

1) American Association for Clinical Chemistry, www.aacc.org

2) Associació Catalana de Ciències de Laboratori Clínic, www.acclc.cat

3) International Federation of Clinical Chemistry and Laboratory Medicine, www.ifcc.org

4) Sociedad española de Química Clínica y Patología Molecular, www.seqc.es

Software

No specific software is used

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PAULm) Classroom practices (master)	1	Spanish	annual	afternoon
(SEMM) Seminars (master)	1	Spanish	annual	afternoon
(TEM) Theory (master)	1	Spanish	annual	afternoon