Use of Languages

Principal working language: catalan (cat)

Contact

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Teachers

Francesca Canalias Reverter
Francisco Rodríguez Frías
Josefina Mora Brugues

External teachers

Alvaro García Osuna
Edgar Zapico Muñiz
Joan Carles Escolà Gil
José Luis Sánchez Quesada
José Manuel Soria Fernandez
Mireia Tondo Colomer

Prerequisites

1) Having the Degree, preferably in Life Sciences and Health (Biomedicine, Biochemistry, Genetics, Medicine, Veterinary Medicine, Pharmacy, etc.)
2) Good level of Catalan or Spanish and English. Most classes will be in Catalan but Spanish will be used if a student does not understand Catalan. If necessary and for the same purpose, English will be used instead of Spanish. English will be used for sure for reading and analyzing scientific papers.

Objectives and Contextualisation

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

- Analyse and correctly interpret the molecular mechanisms operating in living beings and identify their applications.
- Analyse and explain normal morphology and physiological processes and their alterations at the molecular level using the scientific method.
- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Continue the learning process, to a large extent autonomously.
- Develop critical reasoning within the subject area and in relation to the scientific or business context.
- Identify and propose scientific solutions to problems in molecular-level biological research and show understanding of the biochemical complexity of living beings.
- Identify and use bioinformatic tools to solve problems in biochemistry, molecular biology and biomedicine.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
- Use and manage bibliography and IT resources related to biochemistry, molecular biology or biomedicine.
- Use scientific terminology to account for research results and present these orally and in writing.

Learning Outcomes

1. Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
2. Continue the learning process, to a large extent autonomously.
3. Develop critical reasoning within the subject area and in relation to the scientific or business context.
4. Evaluate and implement improvements or changes, either in methods or parameters, in the clinical laboratory.
5. Identify the main new trends within clinical biochemistry and molecular pathology and understand how these depend largely on the application of new methods and technologies.
6. Identify, from examples, the practical applications of new methodological and interpretative advances in laboratory medicine.
7. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
8. Interpret results from clinical analyses on different groups of pathologies and their sequential implementation following pre-established algorithms.
9. Recognize and explain the special characteristics and requirements of the biochemical and genetic analyzes carried out in clinical laboratories.
10. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
11. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
12. Use and manage bibliography and IT resources related to biochemistry, molecular biology or biomedicine.
13. Use bioinformatic tools to process genome data for research or laboratory diagnosis of human diseases.
14. Use scientific terminology to account for research results and present these orally and in writing.

Content
<table>
<thead>
<tr>
<th>Day</th>
<th>Topic</th>
<th>Speaker</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Introduction. Academic and job opportunities in Clinical Biochemistry and Molecular Pathology</td>
<td>F. Blanco</td>
<td>04-nov</td>
<td>Unitat Docent Sant Pau</td>
</tr>
<tr>
<td>Wednesday</td>
<td>INVITED CONFERENCE: Molecular basis of complex diseases</td>
<td>J.M. Soria</td>
<td>06-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Monday</td>
<td>STANDARDIZATION AND QUALITY (tema I)</td>
<td>F. Canalias</td>
<td>11-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Wednesday</td>
<td>Standardization and quality</td>
<td>F. Canalias</td>
<td>13-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Friday</td>
<td>Standardization and quality</td>
<td>F. Canalias</td>
<td>15-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Monday</td>
<td>SEMINAR 1. Mass spectrometry: basis and clinical applications</td>
<td>E. Zapico</td>
<td>18-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Wednesday</td>
<td>LIPIDS, LIPOPROTEINS AND ARTERIOSCLEROSIS (topic II): Familial Hipercholesterolemia</td>
<td>F. Blanco</td>
<td>20-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Monday</td>
<td>Discussion of papers related to seminar 1 (first part) and topic II and seminars 2 and 3 (second part)</td>
<td>E. Zapico / F Blanco</td>
<td>25-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Wednesday</td>
<td>VIRAL HEPATITIS (topic III). Discussion clinical cases and/or papers</td>
<td>F. Rodriguez Frias</td>
<td>27-nov</td>
<td>Unitat Docent Sant Pau</td>
</tr>
<tr>
<td>Friday</td>
<td>CONGENITAL ERRORS OF METABOLISM (topic IV)</td>
<td>M. Tondo</td>
<td>29-nov</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Monday</td>
<td>PRENATAL SCREENING (topic V)</td>
<td>J. Mora</td>
<td>2 dec</td>
<td>Unitat Docent Sant Pau</td>
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<tr>
<td>Wednesday</td>
<td></td>
<td>J. Mora</td>
<td>4 dec</td>
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Methodology

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: 50 h).

Activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type: Directed</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>theoretical lessons, seminars, aula practicum: 50 h</td>
<td>5</td>
<td>0.2</td>
<td>4, 3, 5, 6, 8, 7, 10, 2, 9, 11</td>
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<tr>
<td>theoretical lessons, seminars, aula practicum: 50 h</td>
<td>15</td>
<td>0.6</td>
<td>4, 5, 6, 8, 7, 10, 1, 2, 9, 13, 11, 12, 14</td>
</tr>
<tr>
<td>theoretical lessons, seminars, aula practicum: 50 h</td>
<td>25</td>
<td>1</td>
<td>4, 5, 7, 2, 9, 11</td>
</tr>
<tr>
<td><strong>Type: Supervised</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study of clinical cases and reading scientific papers for class discussion: 67.5 h</td>
<td>67.5</td>
<td>2.7</td>
<td>4, 3, 5, 6, 8, 7, 10, 1, 2, 9, 13, 11, 12, 14</td>
</tr>
<tr>
<td><strong>Type: Autonomous</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study: 106.5 h</td>
<td>106.5</td>
<td>4.26</td>
<td>4, 3, 5, 6, 8, 7, 10, 2, 9, 13, 11, 12, 14</td>
</tr>
</tbody>
</table>
Assessment

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.

Assessment Activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Weighting</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance and active participation in classes</td>
<td>30%</td>
<td>0</td>
<td>0</td>
<td>4, 3, 5, 6, 8, 7, 10, 1, 2, 9, 13, 11, 12, 14</td>
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<tr>
<td>Oral presentation of projects or clinical cases</td>
<td>40%</td>
<td>4</td>
<td>0.16</td>
<td>4, 3, 6, 8, 7, 10, 1, 2, 9, 11, 12, 14</td>
</tr>
<tr>
<td>Presentation of homework and reports, small exams of short questions (in writing)</td>
<td>30%</td>
<td>2</td>
<td>0.08</td>
<td>3, 6, 8, 7, 10, 1, 2, 11, 12, 14</td>
</tr>
</tbody>
</table>

Bibliography

TEXTBOOKS:


SCIENTIFIC JOURNALS:

1) Clinical Chemistry
2) Clinica Chimica Acta
3) Clinical Biochemistry
4) Circulation
5) Circulation Research
6) Blood

7) Arteriosclerosis, Thrombosis and Vascular Biology

8) Journal of Lipid Research

9) Diabetes

10) Diabetes Care

11) Kidney International

12) American Journal of Human Genetics

CLINICAL LABORATORY WEBSITES:

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

2) Associació Catalana de Ciències de Laboratori Clinic, 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