Universidad Zaragoza

Academic Year/course: 2023/24

26703 - Human biochemistry

Syllabus Information

Academic year: 2023/24
Subject: 26703 - Human biochemistry
Faculty / School: 104 - Facultad de Medicina
229 - Facultad de Ciencias de la Salud y del Deporte
Degree: 304 - Degree in Medicine
305 - Degree in Medicine
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module:

1. General information

This subject provides knowledge of the structure and metabolism of biomolecules, the obtaining and utilization of energy, and the molecular basis of heredity and regulatory mechanisms.

Their knowledge allows us to understand human physiological processes, their alterations, and the mechanisms of action of many therapies.

These approaches are aligned with the Sustainable Development Goals of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), their learning results provide training and competence to contribute to some extent to their achievement: Goal 3: Health and wellness, 4: Quality education and 5: Gender equality.

2. Learning results

The student, in order to pass this subject, must demonstrate the following results...

1. Is able to identify and know the structure of biomolecules, the metabolic reactions of transformation and synthesis of these biomolecules, as well as the regulation mechanisms.
2. Knows the mechanisms of obtaining metabolic energy.
3. Describe the molecular basis of genetic inheritance.
4. Is able to manage in a biochemical laboratory and to perform the most basic biochemical techniques.
5. Is able to use biomedical information sources: Ability to search bibliography in PubMed (https://pubmed.ncbi.nlm.nih.gov/) to write on a topic. Sufficient knowledge of English to be able to understand the scientific terminology of an international biomedical journal.
6. Initiate the knowledge of the medical applications of Biochemistry: Differentiate normal biochemical values from their pathological variations.

3. Syllabus

I-Amino acids and proteins

Structure and conformation of proteins. Enzymes and vitamins.

II-Storage and use of genetic information

DNA replication and transcription. Protein biosynthesis. Mitochondrial genome.

III-Intermediate metabolism

IV-Carbohydrate Metabolism

Glycolysis. Citric acid cycle. Biological oxidation and respiratory chain. Gluconeogenesis. Glycogen metabolism and its regulation. Pentose phosphate pathway. Metabolism of heterosides.

V-Lipid Metabolism

Metabolism of triglycerides, complex lipids and cholesterol. Cholesterol derivatives with biomedical significance. Metabolic integration.

VI-Metabolism of nitrogen compounds

Metabolism of amino acids and their precursor functions (amines, nitrogenous bases and heme group).

4. Academic activities

1-Theoretical classroom lectures (34h). Participative sessions with presentation of theoretical contents.

2-Seminars and resolution of clinical cases (12h). Interactive sessions with expansion of theoretical contents and application to the resolution of real situations.

3-Laboratory practices (14h). Acquisition of skills by performing simple laboratory techniques.

The student will be informed of the risks that may be involved in these activities and of the procedures in case of accident, signing the commitment to comply with the work and safety rules (http://uprl.unizar.es/estudiantes.html) 4-Directed work (5h). Acquisition and development of transversal skills and deepening of theoretical contents.

The materials used will be published in the ADD (Anillo Digital Docente)

Attendance and completion of activities 2, 3 and 4 is mandatory.

The time dedicated to this subject is completed with tutorials, evaluation and autonomous work of the student.

5. Assessment system

1) Theoretical knowledge. It represents 80% of the final grade. It will be evaluated by means of multiple choice tests. The random factor will be discounted but not the wrong answers. It will be passed with a grade of 5 out of 10.

- Midterm evaluation: in the middle of the semester, students will be offered the possibility of eliminating material by passing a test on the contents covered so far. Students who pass the midterm evaluation will be required to take the remaining topics on the date of the final exam, by means of a 40-question test

- Final exam: 60-question test on the entire syllabus.

2) Knowledge and practical skills: They represent 10% of the final grade. They will be evaluated through questionnaires at the end of each practice. Those students who do not pass this evaluation will answer a test on the day of the final exam.

3) Transversal skills and theoretical contents developed in directed work: They represent 10% of the final grade. They will be evaluated by rubric.

The theoretical part must be passed in order to take into account the grades obtained in sections 2 and 3.

Students enrolled in the second or subsequent enrolment must perform all practical activities, unless expressly authorized by the coordinating teacher.