Universitat Autònoma de Barcelona

2020/2021

Basic Advanced Pharmacology

Code: 42359
ECTS Credits: 9

Degree	Type	Year	Semester
4311309 Pharmacology	OB	0	1

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: spanish (spa)

Teachers

Jordi Alberola Domingo
Antoni Barbadilla Prados
Anna Maria Bassols Teixidó
Victoria Clos Guillén
Jesus Giraldo Arjonilla
Marcel Jiménez Farrerons
Ignacio José Gich Saladich
Caridad Pontes García
Joan Seoane Suárez
Javier Cortés Castán

External teachers

P. DOcon

Prerequisites

Basic knowledge of physiology, biochemistry and cell biology taught in degrees belonging to Health Sciences, Biosciences and Sciences.

Objectives and Contextualisation

Acquire the basic scientific knowledge of pharmacology and deepen into the knowledge of the physiological, biochemical and genetic concepts that support them. Introduction to the criteria for clinical use of drugs.

Competences

- Capacitat d'anàlisi i síntesi.
- Definir les diferents etapes del recorregut dels fàrmacs pel organisme, descriure les seves característiques i interpretar la seva relació amb l'efecte farmacològic.
- Desenvolupar habilitats d'autoaprenentatge.
- Desenvolupar un pensament crític i autocrític.
- Recognise the criteria for the clinical use of drugs.
- Recognise the scientific bases of pharmacology and the physiological, biochemical and genetic concepts that underpin it.

Learning Outcomes

1. Analyse the drug-pharmacological effect relationship.
2. Analyse the origin of variation in response to drugs.
3. Capacitat d'anàlisi i síntesi.
4. Define the different stages of drugs' transit through the organism.
5. Describe the characteristics of drugs.
6. Desenvolupar habilitats d'autoaprenentatge.
7. Desenvolupar un pensament crític i autocrític.
8. Explain the mechanism of action of drugs as modifiers of biological activity.
9. Identify the principles of genetics, molecular biology and cell biology that underlie the structure, action and effects of drugs.
10. Interpret the clinical implications of the basic concepts in pharmacology: clinical response and adverse effects.

Content

a) Pharmacokinetics: concepts, definitions, objectives and LADME processes. Release: concept and importance of galenic formulation, definitions (pharmaceutical form, formulation, etc.), impact of the pharmaceutical form on therapeutic efficacy, drug stability. Pharmaceutical forms: dissolution / suspension, topical administrations (emulsions, transdermal patches, solid formulations, new technologies). Absorption. Distribution. Metabolism. Excretion. Compartmental Models. Non-compartmental Models and independent model methods. Kinetics dose / dependent time. Kinetics of metabolites. Relation between kinetics and dynamics: PK-PD modeling. Clinical impact of pharmacokinetic parameters. Design of the posology guidelines: pharmacokinetic and pharmacodynamic factors.

b) Pharmacodynamics: definition and basic principles. Action and pharmacological effect. Concept of pharmacological selectivity and reversibility. Concentration curve / effect: description of the main parameters that describe this relationship. Pharmacological targets: receptors, enzymes, ion channels, carriers and cellular structures. Receptor-mediated actions: receptor concept, drug-receptor interaction (kinetic and occupational theories), agonism and pharmacological antagonism, structural characteristics of the main types of receptors. Receptor regulation: sensitization and desensitization, constitutive state of a receptor, reserve receptors. Pharmacological actions mediated by ion channels: types of ion channels. Enzyme-mediated pharmacological actions: different mechanisms of drug-enzyme interaction, types of enzymes as pharmacological targets. Pharmacological actions mediated by carriers. New pharmacological targets: genes, exogenous receptors. Temporary aspects of the pharmacological response: tolerance, sensitization.

c) Definitions and historical evolution. Basic elements of molecular biology, the human genome, protein biosynthesis. Pharmacogenetics: expression of polymorphisms with pharmacokinetic or pharmacodynamic implications. Impact of pharmacogenetics on therapeutic efficacy and adverse effects. Pharmacogenomics. Pharmacoproteomics: protein configuration and therapeutic efficacy. Systems biology: metabolomics and cytomics. Personalized pharmacology. Bioethical aspects.

d) Clinical response to drugs and their measurement. Treatment of symptoms, modification of the evolution of the disease, healing and prevention. Clinical events versus subrogated variables. Adverse effects and their identification: toxic effects, classification of adverse effects according to different dimensions (mechanisms of production, frequency, severity, etc.), causality. The benefit / risk relationship in the administration of drugs. Overdose and poisoning: basic principles of intervention.

e) Patient's own factors (sex, age, race, etc.): examples. Factors characteristic of the patient's pathology (alterations of the organs and systems responsible for the absorption, distribution and elimination processes): examples. Pharmacological interactions with drugs and other substances: examples.

Methodology

The module's global mark is the arithmetic mean of all subjects' marks within the module.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Clinical cases seminars	5	0.2	2, 1, 3, 4, 5, 7, 8, 9, 10
Practical seminars	14	0.56	2, 1, 3, 4, 7, 8, 9, 10
Theory lessons	49.5	1.98	2, 1, 3, 4, 5, 7, 8, 9, 10
Type: Supervised			
Non-scheduled tutorials	3	0.12	2, 1, 3, 4, 5, 7, 8, 9, 10
Paper revisions	16	0.64	2, 1, 3, 4, 5, 7, 8, 9, 10
Scheduled tutorials	4	0.16	2, 1, 3, 4, 5, 7, 8, 9, 10
Type: Autonomous			
Study, papers,..	130	5.2	1, 3, 4, 5, 6, 7, 8, 9

Assessment

Each subject that composes the module is evaluated independently, and the module's global mark is the arithmetic mean of all subjects' marks within the module. You must have attended at least 80 % of the sessions.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attendance and active participation	40 %	0	0	2, 1, 3, 4, 5, 6, 7, 8, 9, 10
Exams	24 %	1.5	0.06	2, 1, 3, 4, 5, 7, 8, 9, 10
Oral paper presentations	18 %	1	0.04	2, 1, 3, 4, 5, 7, 8, 9, 10

Paper writing	18 %	1	0.04	2, 1, 3, 4, 5, 7, 8, 9, 10

Bibliography

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