27137 - Pharmacology

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	446 - Degree in Biotechnology
ECTS	6.0
Course	4
Period	First semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

For students enrolled in the subject, places, times and dates of lectures and practical sessions will be public via Bulletin Board advertisements of the grade on the platform Moodle at the University of Zaragoza, https://moodle2.unizar.es/add/, and in the moodle page for the course. These routes will be also used to communicate enrolled students their distribution by groups of practical sessions, which will be organized by the coordination of degree. Provisional dates will be available on the website of the Faculty of Sciences in the corresponding section of the Degree in Biotechnology: https://ciencias.unizar.es/grado-en-biotecnologia.

In this web there will be also available the dates of exams.

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

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5.Activities and resources

5.1.General methodological presentation

5.2.Learning activities

5.3.Program

Theoretical Classes

General Principles of Pharmacology

- **Pharmacology concepts:** active pharmaceutical ingredient, drug. Drug life cycle research.
- **Pharmacokinetics** : Drug passage across the membrane. Routes of administration. Drug absorption. Drug distribution. Drug metabolism and excretion.
- **Pharmacodinamics** : Mechanism of drug actions. Pharmacological actions. Drug receptor concept and types. Dose-response curves. Pharmacological interactions.
- **Side effects**
- **Pharmacogenetics and Pharmacogenomics**
- **Omic Sciences**
- **Food-drug interactions. Nutrigenomics**
- **Drug development**
- **Clinical Trials and Pharmacoepidemiology**

Action of the Drugs

- **Action of the drugs on G-protein receptors** : neurotransmitters and cellular mediators.
- **Drugs with clinical importance which act at enzyme level:** Arachidonic acid metabolism inhibitors. Cyclooxigenase inhibitors. Lipooxygenasa inhibitors. Acetyl-cholinesterase inhibitors. MAO inhibitors. Irreversible inhibition. Inhibitors of the colesterol synthesis.
- **Action of drugs on the transport systems:** ATPases superfamily, OAT1 (transporters of anions), P-glucoprotein. Drugs that act on the neurotransmitters specific transport proteins
- **Drugs that interact with the transport pumps:** Na+/H+ ATPasa pump. Gastric secretion: proton pump inhibitors **.** Na+/K+ ATPasa pump. Digoxin and other drugs.
- **Drugs related to nuclear receptors:** Estrogens, Vitamin D. Immunosuppressants, glucocorticoids. Chemoterapeutic agents. Antibiotics that interfere in DNA replication and transcription regulation. Antiviral: anti-metabolite and inhibitors of reverse transcriptase.
- **Drugs involving in the modulation of ligand ionic channels** : e.g. Central Nervous System.
- **Voltage ionic channels as therapeutic targets:** e. g. Cardiovascular System.

Practical classes of Pharmacology

1 st module

- **Simulation on drug administration at Cardiovascular level**
- **Workshop: Routes of drug administration and pharmaceutical forms**

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2 nd Module

- **Practical on-site activities: visiting to pharmaceutical company**
- **Pharmacology Congress on University Teaching**

5.4.Planning and scheduling

Schedules of lectures and problems will coincide with the officially established and will be available at: https://ciencias.unizar.es/grado-en-biotecnologia.

The places, calendar and groups for training and practical sessions will be established in coordination with the rest of maters at beginning of course. The Coordinator will produce the groups of students for these activities at beginning of course to avoid overlaps with other subjects

5.5.Bibliography and recomended resources

- Las bases farmacológicas de la terapéutica / [editor, Laurence L. Brunton ; editores asociados, John S. Lazo, Keith L. Parker] ; traducción, José Rafael Blengio Pinto, Jorge Orizaga Samperio, Ana María Pérez-Tamayo Ruiz . 11ª ed. México D.F. [etc.] : McGraw-Hill Interamericana, cop. 2007
- Lorenzo Velázquez, Benigno. Farmacología básica y clínica / Velázquez ; [colaboradores], P. Lorenzo ... [et al.]. 18ª ed. Madrid [etc.] : Editorial Médica Panamericana, 2008
- Farmacología / H.P. Rang ... [et al.] . 6ª ed. Madrid [etc.] : Elsevier, D.L. 2008
- Farmacología fundamental / autores, Alfonso Velasco Martín ... [et al.] . 1ª ed. en español, [reimp.] Madrid [etc.]: McGraw-Hill Interamericana, D.L. 2004
- Farmacología humana / director, Jesús Flórez ; directores asociados, Juan Antonio Armijo, África Mediavilla . 5ª ed. Barcelona [etc.] : Masson, 2008
- Integrated pharmacology / Clive Page ... [et al.] . 2nd.ed. Edinburgh [etc.]: Mosby, 2004