

## SUBJECT TEACHING GUIDE

### 463 - Pharmacogenetics and Pharmacogenomics

#### Master's Degree in Mental Health Research

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Master's Degree in Mental Health Research			Type and Year	Optional. Year 1
Faculty	Faculty of Medicine				
Discipline	Subject Area: New Mechanisms and Molecular Targets in the Treatment of Psychic Disorders				
Course unit title and code	463 - Pharmacogenetics and Pharmacogenomics				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Online Training

Department	DPTO. FISILOGIA Y FARMACOLOGIA
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### 3.1 LEARNING OUTCOMES

- Knowing the fundamentals of pharmacokinetic bases underlying the interindividual variability in drug therapeutic or toxic responses.

- Applying pharmacogenetic concepts to optimize drug therapy individualization.

#### 4. OBJECTIVES

1. Explain the relevance of pharmacogenetics and pharmacogenomics in the treatment of mental health disorders.
2. Provide the students with tools to carry out a critical analysis of the current and future knowledge on pharmacogenetics and pharmacogenomics.

#### 6. SUBJECT PROGRAM

CONTENTS	
1	Historical perspective and current situation of pharmacogenetics and pharmacogenomics.
2	Genetic variants of clinical relevance. Methodologies for their study. Strategies in the study design. Pharmacogenomic studies: GWAS, proteomics and epigenomic.
3	Sequence Databases I: genomic browsers, expression data, reference data, search engines, HapMap and Haploview.
4	Sequence Databases II: searchers of functional SNPs, functional annotation, sequence alignments applications.
5	Interindividual variability in the drug response I. Pharmacogenetics and pharmacokinetics.
6	Interindividual variability in the drug response II. Pharmacodynamics and pharmacogenetics
7	Genetic influence on the side effects associated with psychotropic drugs.
8	Polymorphisms in the study of drug response and efficacy. Applications of pharmacogenetics and pharmacogenomics in the diagnosis and treatment efficacy in psychiatry.
9	EMA (European Medicines Agency) and the FDA (Food and Drug Administration) recommendations regarding the implementation of pharmacogenetics and pharmacogenomics in clinical practice.
10	Role of pharmacogenetics and pharmacogenomics in biomedical R & D and health systems.
11	Ethical and legal aspects. Basis for the approach to the legal implications of personalized medicine.
12	A written essay.

#### 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Tests, exercises and problems.	Activity evaluation with Virtual Media	No	Yes	30,00
A written essay.	Activity evaluation with Virtual Media	No	No	50,00
Participation in forums.	Activity evaluation with Virtual Media	No	Yes	15,00
Student's portfolio	Others	No	Yes	5,00
<b>TOTAL</b>				<b>100,00</b>
Observations				
Those students who have not passed the subject in the ordinary session will have to take the recovery activities in the extraordinary session. These recovery activities consist of: <ol style="list-style-type: none"> <li>1. Tests, exercises and problems. New tests will be presented within the established period.</li> <li>2. Participation in forums. A scientific discussion topic for the forum will be proposed within the established deadline.</li> <li>3. Student folder. Preparation of a new student folder within the established deadline.</li> </ol>				
Observations for part-time students				
N/A				

**8. BIBLIOGRAPHY AND TEACHING MATERIALS****BASIC**

Armijo JA. "Influencia de los factores genéticos, la edad y el embarazo sobre la respuesta a los fármacos". En Farmacología Humana 6ª edición. Florez J, Armijo JA, Mediavilla A editores. Editorial Elsevier, 2014.

Lam YWF. Principles of Pharmacogenomics: Pharmacokinetic, Pharmacodynamic, and Clinical Implications. In: Pharmacogenomics. Challenges and opportunities in therapeutic implementation 2 eds. Lam YWF, Scott SA (eds), 2019.

Liou SY, Stringer F, Hirayama M. The impact of pharmacogenomics research on drug development. Drug Metab Pharmacokinet. 2012; 27(1):2-8.

McDonagh EM, Whirl-Carrillo M, Garten Y, Altman RB, Klein TE. From pharmacogenomic knowledge acquisition to clinical applications: the PharmGKB as a clinical pharmacogenomic biomarker resource. Biomark Med. 2011; 5(6):795-806.

Sadee W. Pharmacogenomic biomarkers: validation needed for both the molecular genetic mechanism and clinical effect. Pharmacogenomics. 2011; 12(5):675-80.

Scott SA. Personalizing medicine with clinical pharmacogenetics. Genet Med. 2011;13(12):987-95.

Wang L, McLeod HL, Weinshilboum RM. Genomics and drug response. N Engl J Med. 2011 Mar 24;364(12):1144-53.