

**Program:** Pharmacology

**Course Name:** Neuropharmacology

**Course Number:** 9706

**Credits:** 3

**Location:** The course will be given in Room 311 Medical Research Building

**Course Director:** Domenico Praticò, M.D. Room 706A MRB. Tel. 2-9380 Fax 2-7068

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Students may communicate by e-mail or phone at any time.

**Office Hours:** The Course Director is generally available Monday to Friday 9AM-5PM by appointment. Other instructors are available on the same terms.

**Prerequisites:** Principles of Pharmacology; General Chemistry, Cell Biology. Familiarity with Chemistry will be helpful but it is not required.

**Disability Statement:** Any student who has a need for accommodation based on a disability should contact the Course Director as soon as possible.

**Times:** The course is offered in the spring semester every other year. This course meets Tuesday and Thursdays from 3-5PM

**Description:** Neuropharmacology is the study of drugs which affect the Nervous System. This definition is a very general one and would include a very large number of drugs which, directly or indirectly (also a side-effect), can also have an effect on this system. For this reason, we prefer to consider Neuropharmacology as the study of drugs which specifically and directly are employed to affect the Nervous System.

The course is based on advanced lectures and interactive discussion in which we will focus on molecular mechanisms of these classes of drugs. Its goal is to present the basic aspects of neuropharmacology by investigating the mechanisms by which drugs influence and/or modulate different neural system activities and functions. In particular, we will focus on the molecular, cellular and biochemical characterization of several classes of drugs with implication for human pathologies. The areas of emphasis are:

- 1. Structure and Function of the Nervous System**
- 2. Neurotransmitters and Neuromodulators**
- 3. Neuroinflammation**
- 4. Neurodegeneration**

The specific areas covered include:

***Structure and Function of the Nervous System***

- Gross Anatomy of the Nervous System
- Neurocellular Anatomy

- Grey and White Matter
- Brain-Blood-Barrier
- Receptors

***Neurotransmitters and Neuromodulators:***

- Acetylcholine
- Dopamine
- GABA
- Glutamate
- Serotonin
- Norepinephrine
- Neuropeptides
- Neuroendocrine
- Cannabinoids

***Neuroinflammation and Lipid Signaling Pathways***

- Cytokines
- Membrane phospholipids
- Phospholipase A2, Eicosanoids, Enzymatic pathways
- PAF
- Neuroimmunology

***Neurodegeneration***

- Neurometabolism (lysosome, peroxisome, and mitochondria)
- Apoptosis and Neuronal Cell Death
- Neurodegeneration and Amyloidosis (AD, PD, ALS, MS)

**Textbook and readings:** The required textbooks are:

Biochemical Basis of Neuropharmacology, 8<sup>th</sup> edition. Cooper J.R. et al Oxford Press.  
Basic Neurochemistry, 7<sup>th</sup> edition. Siegel G.J. et al. Academic Press.

In addition, individual readings in the form of scientific journal articles will be required. The title of these papers will be distributed at the beginning of the course.

Grades are based on a midterm (25%) and a final exam (50%). In addition a 10-12 page paper on a neuropharmacological topic is required (25%).

Topics for the papers will be given out during by the end of the first month of the course.

**Class participation**

Class attendance is required. One excused absence is allowed during the semester. Student absence must be excused or absence will reflect on a student's grade. Please –email the Course Director before the missed class.

Unfortunately, due to the nature of the course, it is impossible to offer make-up sessions and you will miss a considerable amount of information each week. This could result in a serious disadvantage on the exams.

Conflicts regarding the scheduling of the midterm or final exam must be discussed and addressed within the first two weeks of class. There will be no make-up exams for the midterm or final. Students seeking exception to this must provide a note from the dean's office or from the health center. Students with undocumented absences for exams will receive a grade of zero for that exam.