

NExT603 NEUROPSYCHOPHARMACOLOGY:

The class will offer students a comprehensive overview of current neuropharmacological concepts, neurotransmitter systems and their receptors, and neurotoxins used to characterize different receptor classes. Students will present research papers and lead a discussion on selected topics. In the second half neurological diseases and pharmacological intervention strategies will be discussed and the students will have an opportunity to research their favorite neurological disease and present their findings to the class in form of a lecture under the supervision of a skilled facilitator.

FALL 2010: Credit hours: 4; Permission of coordinator required

TUESDAYS and THURSDAYS 2:00PM-4:00 PM

Meets in ROOM 300, Reynolds Medical Building

Grading: Exams: 60%, Student lecture: 20% each; Class presentations discussions including summaries of JC and special lectures: 20%.

Coordinator: Ursula Winzer-Serhan, Associate Professor - 369 RMB

Instructors: Gerald Frye, Professor - 371 RMB

William Griffith, Professor and Chair - 228 RMB

David Murchison, Assistant Professor – 365 RMB

Samba Reddy, - Associate Professor, - 304 RMB

Gregg Wells, – Associate Professor – 204 RMB

Dustin Dubois, Assistant Professor - 362 RMB

Date	Topic	Instructor	Room (RMB)
08/31/10 T	Class Introduction, General principals of Pharmacology and pharmacokinetics and drug metabolism I. (lecture)	Winzer-Serhan, Griffith	300
09/02/10 - R	Drug/receptor interaction, allosteric modification, drug development. (lecture)	Reddy	
09/07/10 - T	General principals of Pharmacology and pharmacokinetics and drug metabolism II. (lecture)	Griffith/Murchison	300
09/09/10 – R	Voltage gated Ion channels: (lecture)	Murchison	300
09/14/10 T	Excitatory neurotransmitters: Glutamate I. (lecture)	Reddy	300
09/16/10 - R	Excitatory neurotransmitters: Glutamate II. (lecture) (student JC presentations)	Reddy	300
09/21/10 - T	MID TERM EXAM 1 (Covers 08/27/09-9/17/09) 2:00 - 4:00 PM	Griffith/Murchison/ Reddy	300

09/23/09 - R	A,B,Cs of GABA receptors / GABA pre-synaptic mechanisms / Glycine receptors (lecture) (lecture)	Frye/Dubois	
09/28/10 - T	Allosteric modulation and GABA _A Rs (lecture)	Frye/Dubois	300
09/30/10 - R	Molecular-cellular-systems level mechanisms of general anesthesia (lecture/ student JC presentations)	Frye/Dubois	300
10/05/10 - T	Ligand gated ion channels: nicotinic Acetylcholine receptors: structure and function. (lecture)	Wells	300
10/07/10 - R	Ligand gated ion channels: nicotinic Acetylcholine receptors: medical pharmacology (lecture)	Winzer-Serhan	300
10/12/10 - T	MID TERM EXAM 2 (Covers 09/24/09-10/8/09) 2:00 - 4:00 PM	Frye, Wells, Serhan	Dubois, Winzer- 300
10/14/10 - R	G-protein coupled receptors: muscarinic cholinergic receptors. (lecture)	Griffith	300
10/19/10 - T	G-protein coupled receptors: opioids. (lecture)	Winzer-Serhan	300
10/21/10 - R	G-protein coupled receptors: opioids. (lecture) (Student JC presentations)	Winzer-Serhan	300
10/26/10 - T	Monoamine transporters (lecture)	Winzer-Serhan	300
10/28/10 - R	Neurotransmitter transporter (lecture) (Student JC presentations)	Winzer-Serhan	300
11/02/10 - T	Catecholamines; Neurotransmitter and receptors. (lecture)	Winzer-Serhan	300
11/04/10 - R	MID TERM EXAM 3 (Covers 10/20-11/05/09) 2:00 - 4:00 PM	Griffith, Serhan	Winzer- 300
11/09/10 - T	Neurological diseases: Epilepsy.	Guest/student lecture	300
11/11/10 - R	Neurological diseases: Depression	Guest/student lecture	300
11/16/10 - T	No Class - Society for Neuroscience Annual meeting		300
11/18/10 - R	No Class - Society for Neuroscience Annual meeting		300

11/23/10 - T	Neurological diseases: Insomnia	Guest/student lecture	300
11/25/10 - R	Thanks Giving		300
11/30/10 T	Neurological diseases: Schizophrenia	Guest lecture	
12/02/10 - R	Neurological diseases: Alzheimer's,	Guest/student lecture	300
12/07/10 T	Neurological diseases: 1 Parkinson, 2. Anxiety,	Guest/student lecture	300
12/09/10 R	Neurological diseases: 1. Addiction, 2. ADHD,	Guest/student lecture	300

Grading: Exams are 60% of the final grade

Midterm 1 = 20% of final grade -- covers material and paper discussions for the first part of the course.

Midterm 2 = 20% of final grade -- covers material and paper discussions for the second part.

Midterm 3 = 20% of final grade -- covers material and paper discussions for the second part.

Student topic presentation must include a handout = 20% of final grade – Each student will prepare and present one 60 min lecture that includes a handout and other relevant lecture materials to a clinically relevant topic.

The lecture and the handouts will be evaluated as follows: The material presented is relevant to the topic and is presented clearly. Questions are answered correctly. The handout is easy to follow and covers the relevant material presented in the lecture. The presentations will be evaluated by the attending faculty.

The lecture should address:

- a) clinical signs and symptoms of the disease,
- b) relevance for society in terms of treatment costs, and lost productivity etc..
- c) relevant preclinical models used to develop new treatment strategies
- d) currently available drugs, their mechanism of actions, effects and side effects.

Topics for student lectures: Topics need to be coordinated with the course coordinator. Faculty mentors (in parenthesis for each topic) will assist the students in the preparation of the lecture material.

Neurological diseases: Schizophrenia. (Griffith)

Neurological diseases: Depression/Anxiety. (Winzer-Serhan, Frye)

Neurological diseases: Traumatic brain injury. (TBA)

Neurological diseases: Addiction and dependence. (Winzer-Serhan)

Neurological diseases: Alzheimer's. (Griffith)

Neurological diseases: Parkinson's (Frey)

Neurological diseases: ADHD (Reddy)

Neurological diseases: Insomnia (Reddy)

Neurological diseases: Posttraumatic stress disorder. (TBA)

Presentations and summaries of research papers and guest lectures: = 20% of final grade. Each student will present a research paper on a topic assigned by the lecturer, when not presenting themselves, the students will write a review about the paper to be discussed and turn it in prior to the discussion. Paper presentations will be evaluated as follows: Obvious effort has been made to read, understand and prepare an outline (to hand out) and transparencies of the papers in such a way as to effectively lead the discussion of their meaning (100%); the paper has been read but the contents were not understood sufficiently to be effectively discussed and/or no outline was prepared for the class (70%); being totally unprepared or absent (0%). Each student will be assigned at 1 paper to prepare for presentation to the class during the course. **Students also will be held accountable for the content of all papers on the Midterm and Final exams.**

Research Paper Presentations / Discussions:

One week prior to each class discussion period, a research papers will be assigned. A specific student will be assigned to prepare and present the paper. All members of the class are expected to read and be prepared to ask questions about all the papers, and hand in a one page summary about the paper. Grades for the paper discussions will be based on the paper presentation and participation in paper discussion in class. The faculty strongly encourages use of the following outline to prepare written notes for your paper presentation. To facilitate presentation of the papers, overhead transparencies of tables and figures also should be prepared.

1. **Introduction:** What is the purpose of the study? What evidence makes this experiment the next logical step? What is the background literature upon which the proposed experiment is based?
2. **Methods:** Describe the methodology in general terms such as cell culture, whole cell electrophysiology or single cell RTPCR. Do not present excessive detail concerning such things as the pH of solutions, extraction procedures, or temperature of the vivarium. Be prepared to discuss these details if asked. Why are these specific techniques being used as opposed to alternative methodologies? Are these techniques appropriate?
3. **Results:** What are the major findings of the study? As much as possible this should be explained using the figures and tables of the paper. Are there appropriate controls? Are the statistics appropriate?
4. **Discussion:** What are the major conclusions of the study? What experimental evidence do the authors use to support their conclusions? Are the conclusions appropriate? Are the data misinterpreted or inappropriately emphasized? What future experiments would you propose based on these findings, i.e. what's the next logical step?