

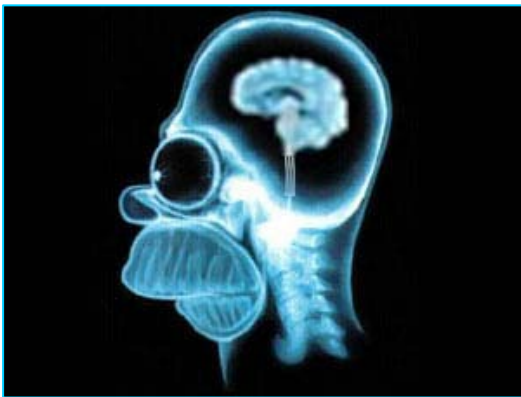
Wilkes University
Nesbitt School of Pharmacy

Department of Pharmaceutical Sciences

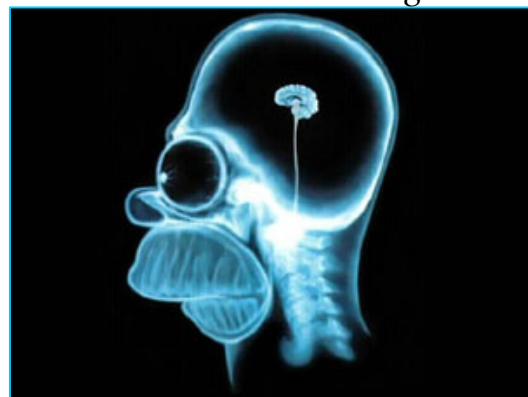
PHA 450

Neuropharmacology of Drugs of Abuse

Your Brain



Your Brain on Drugs



Instructor: Dan F. McCune, Ph.D.

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M & W 10:00 am – Noon
F 11:00 am – Noon

<u>Course Title:</u>	Neuropharmacology of Drugs of Abuse
<u>Course Number:</u>	PHA 450
<u>Course Credits:</u>	3
<u>Course Prerequisites:</u>	Willingness to put up with instructors odd sense of humor...
<u>Class Location /Time:</u>	SLC147 Tues. / Thurs. 9:30 AM – 10:45 AM

Course Description:

As stated by Katzung (2000), "Pharmacology can be defined as the study of substances that interact with living systems through chemical processes, especially by binding to regulatory molecules and activating or inhibiting normal body processes." Neuropharmacology is the sub-discipline placing emphasis on drug interactions with the nervous system. The aim of this course is to review the pharmacological principles, behavioral paradigms, mechanisms of drug action and biochemical processes relevant to *Psychoactive* drugs, those altering mood, thought processes and/or behavior as well as the *Psychotropic* drugs used in the treatment of mental illnesses. The focus will be directed towards drugs that are used recreationally or have a high liability for abuse. The materials emphasize the history of drug use, molecular mechanisms of action, medicinal chemistry, and both physiological and psychological effects.

Course Educational Outcomes:

Knowledge of Basic Science, Math, Economic, and Regulatory Principles

- 1.1.1 Demonstrate skills in mathematics for accurate prescription preparation, analysis of bio-physical processes and/or socioeconomic data.
- 1.1.2. Utilize concepts in biochemistry, molecular biology, pharmacology, and immunology to understand the actions and uses of current and future drugs.
- 1.1.3. Demonstrate knowledge of the functional groups of drugs and other aspects of medicinal chemistry important for drug disposition and drug- target interactions.
- 1.1.4. Demonstrate knowledge of drug mechanisms of action and toxicities.
- 1.1.5. Demonstrate knowledge of physiochemical, pharmacokinetic, and pharmacodynamic principles underlying drug disposition and elimination.

Evaluate the Prescription, Prepare, and Dispense Medication

- 1.2.1. Consider legal requirements, ethical principles, and relevant policies to assess drug orders and prescriptions.
- 1.2.8. Accurately dispense drug products in accordance with legal requirements and professional responsibilities.

Assess and Interpret Patient Information

- 1.5.1. Explain the etiology and risk factors for drug related problems.
- 1.5.2. Explain the purpose / indication for drug therapy.
- 1.5.3. Calculate and interpret population and individual pharmacokinetic and pharmacodynamic data.

Design and Implement a Patient-Specific Pharmaceutical Care Plan

- 1.6.1. Utilize basic science, math, economic and therapeutic principles in selecting and justifying drug therapy for a patient.
- 1.6.2. Recommend drug therapies based on patient-, drug-, and disease-specific parameters.

Course Learning Objectives:

After this course, students should be able to:

1. List the structure and function of the primary components of the mammalian brain.
2. Describe the process of neurotransmission and analyze how drugs alter the process.
3. List prominent neurotransmitters and discuss their role in normal function and in the pathophysiology of disease.
4. Describe the pleasure-reward pathway and its normal role in behavior and survival.
5. Explain how drugs with seemingly opposite effects (stimulants and depressants) both activate the reward pathways.
6. Describe the mechanisms of action, at the molecular and physiological level, of various drugs with a liability for abuse.
7. Identify structure activity relationships relevant to various drugs of abuse.
8. Discuss short and long term effects of drugs of abuse at both the molecular and physiological level.
9. Recognize prominent psychological effects of drugs with a high liability for abuse.
10. Review treatments and strategies employed during detoxification and the maintenance of abstinence from drugs of abuse.

Course Evaluation: Based on content from lecture

3 Exams @ 100 points each	70%
3 Quizzes	15 %
Class Participation	5 %
Class Projects	10 %

Exams: All exams must be returned to the course instructor in class on the day on which it is made available for review. **Failure to do so will result in a grade of zero for the examination.**

Students will have **5 school days to review an exam** after grades are made available to identify problem areas, verify grading or contest answers to questions. **Exams will not be available and grades will not be revised after this time period.**

Quizzes will be held on the dates shown in the schedule and will cover the material presented since the last exam.

Class Participation: In order to earn the points for class participation you must contribute to the class discussion at least one time per week. This could take the form of a question, comment or other contribution to classroom discussions.

Class Projects: Students will be required to find one news article per month (i.e. one each for September, October, and November) relating to drugs of abuse. Each article will be accompanied by a written summary of the article. This summary should be at least 1 page (double – spaced) and include an explanation of how this article relates to drugs of abuse and a position statement (real or imaginary) regarding the matter presented in the news article.

Course Grade Scale:

92 to 100	4.0	65-69	1.5
85 to 91	3.5	60-64	1.0
80 to 84	3.0	<60	0.0
75 to 79	2.5		
70 to 74	2.0		

Textbook:

No textbook will be required for the course. For your information I have provided a list of texts consulted for the course.

Brunton L, Lazo J, Parker K, Buxton L, Blumenthal D (2006). *Goodman & Gillman's The Pharmacological Basis of Therapeutics*. 11th ed. New York: McGraw-Hill.

Drummer O (2001). *The Forensic Pharmacology of Drugs of Abuse*. 1st ed. London: Arnold.

Julian (2005). *A Primer of Drug Action: A comprehensive guide to the actions, uses, and side effects of psychoactive drugs*. 10th Edition, New York: Henry Holt & Company, Inc.

Kuhn C, Swartzwelder S, Wilson W (2003). *Buzzed, The Straight Facts about the Most Used and Abused Drugs from Alcohol to Ecstasy. Just Say Know*. 2nd ed. New York, London: W.W. Norton & Co.

Stahl SM (2008). *Essential Psychopharmacology*, 3rd ed. New York: Cambridge University Press.

Williams D, Lemke T (2013). *Foye's Principals of Medicinal Chemistry*. 7th ed. Baltimore: Lippincott Williams and Wilkins.

Attendance and Student Responsibilities: Make up exams will be provided only in exceptional cases and at the discretion of the instructor. Attendance is expected in all lectures

Academic Honesty: Any violation of the Academic Honesty Policy of the University and plagiarism will not be tolerated. Violators will be subject to full disciplinary action (perhaps including, but not limited to, any of the following: flogging, firing squad, lethal injection, decapitation, impalement, 10 years' service as a galley slave, exile, lycanthropy, and/or a stern talking-to).

Professionalism and Civility Policy: Consistent with the expectations of a professional program, professional behavior and attitude are expected for all students. Lack of respect for other students, professors or staff as demonstrated by comments, tone of voice, or disruptive behavior will not be tolerated. The use of cell phones and/or texting during class is prohibited without prior permission from the instructor. Students in violation of this policy may be subject to dismissal from class, and re-admission following completion of an essay on civility and professionalism.

Neuropharmacology of Drugs of Abuse – PHA 450A

The following schedule is intended as a guide for the course. Information and topics may be added or deleted based on the progression of a particular class or the availability of guest speakers.

Date	Day	Topic
Aug 26	T	Neuroanatomy, the Neuron, & Synaptic Transmission
Aug 28	R	Neurotransmitters
Sept 2	T	Pharmacodynamics & Pharmacokinetics of Abuse
Sept 4	R	Quiz 1 + Pharmacodynamics & Pharmacokinetics of Abuse
Sept 9	T	History Channel Series – Cocaine
Sept 11	R	GUEST - Joe Coffay - DEA
Sept 16	T	Cocaine
Sept 18	R	Cocaine & Amphetamines
Sept 23	T	Amphetamines
Sept 25	R	<u>EXAM 1 (Neuroanatomy - cocaine)</u>
Sept 30	T	Frontline – Meth Epidemic
Oct 2	R	Alcohol – Intro & Kinetics
Oct 7	T	Quiz 2 + Alcohol Pharmacodynamics
Oct 9	R	NO CLASS - FALL RECESS
Oct 14	T	Alcohol Abuse, Volatile Substance Abuse
Oct 16	R	Volatile Substance Abuse / Barbs, BZDs, GHB
Oct 21	T	GUEST - Bob Rossi - SARPH
Oct 23	R	<u>EXAM 2 (Amphetamines – GHB)</u>
Oct 28	T	Documentary – Oxycontin Express or History Channel Series - Opium
Oct 30	R	Narcotics/Opioids
Nov 4	T	Narcotics/Opioids
Nov 6	R	History Channel Series - Marijuana
Nov 11	T	Quiz 3 + Cannabis (Marijuana)
Nov 13	R	Cannabis (Marijuana)
Nov 18	T	History Channel Series – LSD, XTC
Nov 20	R	Psychedelics (Mescaline, Ecstasy, LSD, Ketamine)
Nov 25	T (R)	Psychedelics (Mescaline, Ecstasy, LSD, Ketamine)
Nov 27	R	<u>NO CLASS - THANKSGIVING RECESS</u>
Dec 2	T	Anabolic Steroids
Dec 4	R	Field trip to Iquitos
TBD	?	<u>EXAM 3 (Narcotics though Steroids)</u>