

## PHARMACOLOGY (BIO 320)

Winter Semester, 2006  
Lecture: TR 8:00-9:20<sup>am</sup>  
Carnegie Science Hall  
Room 339

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### Office Hours

Tuesday 1:00<sup>pm</sup> to 2:30<sup>pm</sup>  
Thursday 10:30<sup>am</sup> to 12:30<sup>pm</sup>  
and by appointment

### Class Email Address

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### Course Description

Pharmacology is the study of the actions and effects of drugs within a living system. It deals with all drugs, prescription and over-the-counter, used to prevent disease or treat illness. This course presents mechanisms of action, therapeutic uses and toxicities of important drugs, including drugs that affect the peripheral nervous system, central nervous system, cardiovascular system, gastrointestinal tract, endocrine system, and agents used to treat cancer.

### Course Objectives

Students will learn that drugs fit into classes of similarly acting compounds and that many therapeutic uses and side effects of drugs "make sense" when the molecular and cellular mechanisms of action of the drug are known.

### Required Text

*Basic & Clinical Pharmacology* (2004), Katzung, B.G., Eds., 9<sup>th</sup> ed., McGraw-Hill, New York, NY.

Readings given in the syllabus are required and should be read prior to lecture.

### Recommended Texts

Basic reviews of physiology will be given in lecture. Depending on your background, you may need to consult biology and/or physiology text books to better understand the reviews given in class. There is a limited number of a good human physiology text available at the book store (*Vander's Human Physiology The Mechanisms of Body Function*, 2006, E. Widmaier, H. Raff, and K. Strang, 10<sup>th</sup> Ed., McGraw-Hill, New York, NY).

## Lecture Schedule

<u>Date</u>	<u>Lec</u>	<u>Topic</u>	<u>Readings</u>
Jan 5	1	Course Overview. What is Pharmacology?	Chap 1 pp. 1-10
Jan 10	2	Principles of Drug Action and Pharmacokinetics	Chap 3 pp. 34, 40-46
Jan 12	3	Drug Action and Pharmacokinetics	Chap 4 pp. 51-63
Jan 17	4	Principles: Receptor theory	Chap 2 pp. 11-18, 28-33
Jan 19	5	Drugs Acting on the Peripheral Nervous System <i>Paper Proposal Due</i>	Chap 6 pp. 75-91
Jan 24	6	Drugs Acting on the PNS	Chap 7 pp. 94-107
Jan 26		<i>Exam 1 (Lectures 1-6)</i>	
Jan 31	7	Drugs Acting on the PNS	Chap 8 pp. 109-120
Feb 2	8	Drugs Acting on the PNS	Chap 9 pp. 122-140 Chap 20 pp. 323-328
Feb 7	9	Cardiovascular Drugs: CHF and Anti-Anginal Agents	Chap 11 pp. 160-182 Chap 13 pp. 201-214 Chap 17 pp. 282-284
Feb 9	10	Cardiovascular Drugs: Antihypertensive Agents	Chap 12 pp. 184-199
Feb 14	11	Diuretics <i>Paper Due</i>	Chap 15 pp. 241-257
Feb 16	12	Drugs used in Coagulation Disorders and Anemia and Drugs used to Treat Hyperlipidemia	Chap 33 pp. 529-538 Chap 34 pp. 543-559 Chap 35 pp. 561-574
Feb 21-23		Winter Recess. No Class.	
Feb 28	13	Drugs Acting on the Central Nervous System: Sedative-Hypnotics	Chap 21 pp. 336-342 Chap 22 pp. 351-365
Mar 2	14	Drugs acting on the CNS: Parkinsomism	Chap 28 pp. 447-459
Mar 7		<i>Exam 2 (Lectures 7-13) ** I will be at SOT Meeting Mar 4-8<sup>th</sup>**</i>	
Mar 9	15	Drugs Acting on the CNS: Antipsychotics and Antidepressants	Chap 29 pp. 462-479 Chap 30 pp. 482-495
Mar 14	16	Gastrointestinal Drugs	Chap 63 pp. 1034-105
Mar 16	17	Endocrine Drugs: Thyroid and Antithyroid	Chap 37 pp. 604, 610-618 Chap 38 pp. 625-639
Mar 21	18	Endocrine Drugs: Adrenocorticosteroids	Chap 39 pp. 641-658
Mar 23	19	Endocrine Drugs: Antidiabetic Drugs	Chap 41 pp. 693-713
March 28		<i>Exam 3 (Lectures 14-19)</i>	
March 30	20	Cancer Chemotherapy	Chap 55 pp. 898-929
April 4	21	Cancer Chemotherapy	

**Tuesday, April 11<sup>th</sup>, 1:15<sup>pm</sup> CUMULATIVE FINAL EXAM (Lectures 1-21)**

## Course Requirements and Grading

Final grades will be determined from:

	<u>Points</u>	<u>Percent of Final Grade</u>
Paper	75	15%
Exam 1	100	20%
Exam 2	100	20%
Exam 3	100	20%
Cumulative Final Exam	125	25%
Total:	500 points	100%

Attendance is expected and will be considered in final grade determination.

**Paper:** **Due on Tuesday, February 14<sup>th</sup>**, each student will write a paper (3-4 pages of double-spaced text, plus figures and reference section) on a scientific journal article detailing some aspect of the pharmacological mechanism of action of a specific drug, or class of drugs, that you find interesting. The paper will focus on one specific scientific journal article or perhaps just one specific method/result of a particular research article. It is expected that you will use several scientific articles in gaining an understanding of your paper material (minimum 7-10 references). **Do not focus your paper on a review article.** However, review articles may provide needed background information and give you a general understanding of the drug and/or the disease(s) the drug is used to treat or prevent.

**The body of the paper must address some aspect of the drug's pharmacodynamics (binds to a specific receptor, inhibits a specific protein, triggers a secondary signal pathway, etc.) or pharmacokinetics (the drug is metabolized into the active compound, etc.) accompanied by an in depth explanation of the research methodology used in the scientific journal article to determine the result you are presenting.** The paper may include figures from the scientific article as well as additional figures that help you explain the pharmacology and/or methodology discussed within your paper. Do not include basic clinical information (i.e. 100 patients were dosed and this drug was found to improve the illness in X number of patients . . .). This paper will focus on research at the molecular and/or cellular, not clinical, level.

**Items that may be in the Introduction/Body of you paper include:** Why is this an important drug or class of drugs? Brief history. What are the therapeutic uses of the drug? How is this drug new/different from others in its class? **Items that could be in the Body of your paper include:** What is the hypothesis and rationale of the experiment? What are the specific methods for the experimental results that you are discussing? What are the specific results of the experiment? What conclusions can be drawn from the results and do your conclusions agree with those of the authors of the article? Finally, **a brief Summary section could include:** What are the broader implications of the research, perhaps in terms of patient diagnosis, treatment, prognosis or new drug development?

To help you get started and to allow me to check that we are “on the same page” in terms of your choice of research papers, **you must hand in a paper proposal by Tuesday, January 19<sup>th</sup>, 2006.** The proposal should include a complete copy of the research article that will be the focus of your poster and a 1-2 paragraph description of the hypothesis, methodology, result and broader implications of the experiment you’ll be discussing. You may find the following search engine helpful in finding scientific journal articles: <http://www.ncbi.nlm.nih.gov/PubMed/> . Some journal articles are available on-line but many still need to be requested via ILL, which can take a couple of weeks. To do this paper well you will need to collect several rounds of papers so start now!

Exams: Exams will be a mix of objective and essay questions. More information about the exams, including sample questions, will be given in lecture prior to the first exam. If students have questions after reviewing the lecture material, class time prior to each exam may be used for question and answers to help prepare for the exams. Note that the Final Exam is comprehensive and that exam dates are firm. Missing an exam will result in the student receiving a zero for that exam unless you have contacted me prior to the exam and have an excuse from the Dean of Students Office.

#### Final Grades (Percent of Total Points)

93-100	A
90-92	A-
88-89	B+
82-87	B
80-81	B-
78-79	C+
72-77	C
70-71	C-
68-69	D+
65-67	D
below 65	F

#### **Plagiarism and Academic Misconduct is Unacceptable**

It is the responsibility of each student to read and understand the Bates College Statement on Plagiarism and Academic Misconduct (published as a handbook and distributed to all incoming students) and the Bates College Code of Student Conduct (<http://www.bates.edu/x35306.xml>). Intellectual honesty is of paramount importance in your education and in maintaining the free and open intellectual life of the college. If you do not fully understand what constitutes plagiarism, please see me for clarification and check out the Bates College Website on plagiarism:

(<http://abacus.bates.edu/pubs/Plagiarism/plagiarism.html>). Individuals or groups committing plagiarism or other academic misconduct will receive no credit for the work in question, may fail the course and will be referred to the Dean of Students for disciplinary action by the College.