PHARM 780 (NSCI706)
CNS PHARMACOLGY: FROM NEURONS TO BEHAVIOR

Course Description: This course is an exploration of the neurobiology and pharmacology of the brain and its functional output (behavior). The first half of the course will examine the anatomy, biochemistry, molecular biology, and pharmacology of selected brain neurotransmitter systems. The second half of the course will study the interactions between drugs, neurotransmitters and the environment that influence behavior.

Credit Hours: 3

Course Prerequisites: CNS 702 or permission of the course director

Course Dates: Fall Semester (August 16 - December 21, 2010)

Course Times: To Be Arranged

Course Location: G301

Director:
W. Woolverton, Ph.D.
Professor of Psychiatry and Human Behavior
Vice-Chairman of Research CPN Behavioral Core Leader
Fax: 601-984-5899
Phone: 601-984-5899
Email: wwoolverton@umc.edu
Dept. Website: http://neuroscience.umc.edu
Office hours on request

Required Text and Other Learning Resources:

Other Readings


**Course Overview:** The course is an exploration of the neurobiology and pharmacology of the brain and its functional output (behavior). The first half of the course will examine the anatomy, biochemistry, molecular biology, and pharmacology of selected brain neurotransmitter systems. The second half of the course will study the interactions between drugs, neurotransmitters and the environment that influence behavior.

**Course Objectives:** Upon completion of this course, the student will be able to
1. describe the basic anatomy, neuropharmacology and molecular biology of the brain.
2. describe drug interactions with the brain at the anatomical, pharmacological and molecular levels.
3. describe the basic study of behavior and output of the brain.
4. establish the relationship between drug effects in the brain and changes in behavior.

**Grading Policy and Rubric.**
There will be two written tests; a mid-term worth 40% and a cumulative final worth 60% of the final grade. In-class quizzes may be given; scores on quizzes will be added on a weighted-basis (points earned over total possible points) into the final score.

**Course Policies:**
Students are expected to actively participate in class discussions. This will require attendance at all class sessions and preparation of the assigned readings prior to class. Make-up tests will only be given in the case of severe illness; assignments are due on the assigned date.

**University Policies:**
Students with disabilities (ADA) statement, Refer to UMC policy
Academic honesty statement, Refer to UMC policy

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**PHARM780/NSCI706 Course Schedule:**

<table>
<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>1</td>
<td>Cellular and Molecular foundations</td>
<td>Paul</td>
</tr>
<tr>
<td>2</td>
<td>Introduction to brain systems</td>
<td>Rajkowska</td>
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<td>3</td>
<td>Receptors</td>
<td>faculty</td>
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<tr>
<td>4</td>
<td>Acetylcholine</td>
<td>faculty</td>
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<tr>
<td>5</td>
<td>Amino acid neurotransmitters</td>
<td>Karolewicz</td>
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<td>6</td>
<td>Catecholamines</td>
<td>faculty</td>
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<tr>
<td>7</td>
<td>Serotonin</td>
<td>Iyo</td>
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<tr>
<td>8</td>
<td>Serotonin</td>
<td>Iyo</td>
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<tr>
<td>9</td>
<td>Neuropeptides</td>
<td>Gomez-Sanchez</td>
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<tr>
<td>10</td>
<td>Neuropeptides/Histamine</td>
<td>Gomez-Sanchez</td>
</tr>
<tr>
<td>11</td>
<td>Purinergic pharmacology</td>
<td>faculty</td>
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### Section II. Psychiatry and Neurology

**Section Leader:** G. Bissette

| 15 | Principles and methods of behavioral pharmacology | Paul/Woolverton |
| 16 | Principles of CNS drug development | Faculty |
| 17 | Antidepressants | Paul |
| 18 | Anxiolytics | Karolewicz |
| 19 | Antipsychotics | Bissette |
| 20 | Cognitive disorders | Vig |
| 21 | Movement disorders/Epilepsy | Vig |
| 22 | Sleep | Shaffery |
| 23 | Pain | Ma |
| 24 | Student presentations | Section faculty |
| 25 | Exam | |

### Section III. Substance Abuse

**Section Leader:** W. Woolverton

| 26 | Recreational psychoactive drugs | Woolverton |
| 27 | Psychostimulants | Woolverton |
| 28 | Psychostimulants | Woolverton |
| 29 | Heroin and other opiates | Freeman/Woolverton |
| 30 | Psychedelics | Freeman/Woolverton |
| 31 | Thanksgiving | |
| 32 | Cannabis | Cobb/Woolverton |
| 33 | Alcohol | Miguel-Hidalgo |
| 34 | Nicotine | Liu |
| 35 | Drug-induced neurotoxicity | Miguel-Hidalgo |
| 36 | Student presentations | Section Faculty |
| 37, 38 | Exams | |

*This syllabus and schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.*