Molecular Medicine 8281:
Molecular Pharmacology and Neurobiology of Excitable Tissues

COURSE AND CONTACT INFORMATION
Course: MMED 8281: Molecular Pharmacology and Neurobiology of Excitable Tissues
Semester: Spring, 2016
Time: Wednesdays, from 9 a.m. to 12 p.m.
Location: Ross Hall, First floor, Lobby A132

INSTRUCTOR
Name: Dr. Xin Wang
Campus Address: Ross Hall 654A, School of Medicine and Health Sciences
Phone: 202-994-5029
E-mail: xinwang@gwu.edu
Office hours: Wednesday, 9 am to 4pm

ADDITIONAL FACULTY
Matthew Colonnese, Ph.D. Assistant Professor of Pharmacology & Physiology, GWU
Martha Dávila-Garcia, Ph.D. Associate Professor of Pharmacology, Howard University
Norman Lee, Ph.D. Professor of Pharmacology & Physiology, GWU
Judy Liu, M.D., Ph.D. Assistant Professor of Pediatrics, GW-CNMC
Chiara Manzini, Ph.D. Assistant Professor of Pharmacology & Physiology, GWU
David Mendelowitz, Ph.D. Professor of Pharmacology and Physiology, GWU
Luther Swift, Ph.D. Research Scientist, Pharmacology & Physiology, GWU
Travis O’Brien, Ph.D. Associate Research Professor of Pharmacology & Physiology, GWU
Linda L. Werling, Ph.D. Professor of Pharmacology & Physiology, GWU
Guangying Wu, Ph.D. Assistant Professor in Cognitive Neuroscience, Department of Psychology and GW Institute For Neuroscience, GWU
Colin Young, Ph.D. Assistant Professor of Pharmacology & Physiology, GWU

LECTURERS AND TOPICS
1/13  Wang: Introduction to Molecular Pharmacology of the Central Nervous System
1/20  Colonnese: Membrane excitability and neuron function.
1/27  Colonnese: Network properties and cognition.
2/3   Wu Balance between excitation and inhibition
2/10  Dávila-Garcia: Pharmacology of Cholinergic Systems and their Roles in Brain Functions
2/17  Manzini: Pharmacological Therapies for Intellectual Disability & Autism Spectrum Disorder
2/24  Liu: Neurobiology and Pharmacotherapy of Epilepsy
3/2   Young: Neurobiology of Obesity and Metabolic Disorders
3/9-14  **SPRING BREAK**

3/16  **Swift:**  Regulation of Cellular Calcium

3/23  *midterm due (covers lectures thru 3/2; take-home; handed out 3/16)*

3/30  **Research Day**

4/6  **Marvar:**  Pharmacological Approaches in the Treatment of Hypertension

4/13  **Mendelowitz:**  Pharmacological Principles of the Cardio-Respiratory System

4/20  **Lee:**  Molecular and Computational Biology of G-protein Coupled Receptors

4/27  **O'Brien:**  Pharmacogenomics

5/4  **Final due (covers lectures starting 4/6; take-home; handed out 4/27)**

**COURSE DESCRIPTION**

The purpose of this course is to teach graduate students in the biological sciences the basic principles of molecular pharmacology and neurobiology of excitable tissues, and the methods used in these disciplines. The initial sessions are suitable for students with little previous exposure to the subject. More advanced concepts will be built upon this foundation in following weeks. See schedule below.

**COURSE PREREQUISITE(S)**

Permission of course director

**TEXTS**

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Edition</th>
</tr>
</thead>
</table>

| Allen Siegel and Hreday N. Sapru | *Essential Neuroscience, 3rd ed.* | by Lippincott Williams & Wilkins, 2014 |


**LEARNING OUTCOMES**

As a result of completing this course, students will be able to:

1. Explain the basic properties of ion channels and receptors and how they are affected by drugs
2. Explain the electrical properties of neurons and how they are affected by drugs
3. Explain the electrical properties of cardiac muscle cells and how they are affected by drugs
4. Apply knowledge of basic methodologies in the field to clearly present articles from the literature
5. Analyze the strengths and weaknesses of papers in the field
6. Synthesize knowledge of molecular pharmacology and neurobiology as applied to neurodevelopmental and neurodegenerative diseases, behavioral and cognitive disorders, and myocardial dysfunctions

GRADING
Most weeks, one student will be selected to present papers relevant to that session. Both the student presenter and audience will be graded on their participation in the discussion of the topic; this will represent 30% of the overall grade. Take-home midterm and final exams will each represent the 30% of the overall grade. Class participation account for 10% of the overall grade.

CLASS POLICIES
Attendance at all sessions is mandatory. Each unexcused absence will result in a 10% grade reduction. For university policies on teaching, see http://www.gwu.edu/~academic/Teaching/main.htm

ACADEMIC INTEGRITY
I personally support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: http://www.gwu.edu/~ntegrity/code.html

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM
DISABILITY SUPPORT SERVICES (DSS)
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: http://gwired.gwu.edu/dss/

UNIVERSITY COUNSELING CENTER (UCC) 202-994-5300
The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include:
- crisis and emergency mental health consultations
- confidential assessment, counseling services (individual and small group), and referrals

http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices

SECURITY
In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.