NEUR 651: MOLECULAR NEUROPHARMACOLOGY
Spring 2021; R 10:30-1:10; ONLINE

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Overview: This is a core graduate neuroscience course that covers key concepts in cellular and molecular neuropharmacology. It emphasizes topics such as receptor signaling, mechanisms of cell structure, and the cellular and synaptic impacts of compounds. We will focus principally on the molecular mechanisms of brain disease and treatment. The course also explores current trends in neuropharmacology research and drug development. **Attendance and participation is required.**
Recommended Textbook: **Molecular Neuropharmacology**: A Foundation for Clinical Neuroscience (Second Edition or newer). Eric Nestler, Steven Hyman, Robert Malenka
Class structure and Grading:
This is an online synchronous course and attendance and participation in necessary for success.

- You will be provided a weekly Zoom link prior to the first day of class.
- You must be signed on with audio (muted) and video turned on **by 10:30AM**
- Absence (two times or more) may result in point deduction from the final grade.
- The weekly class time is divided into 2 parts with a 15 min break during the transition.

1. A 1.5-hour lecture
2. A student led presentation and a group discussion of a research article in a Journal Club manner.

Your GRADE will be based on 2 exams (each worth 35%) a presentation (20% graded according to the below rubric), regular attendance and participation (10%).

Presentation Rubric

Criteria	Strong (10)	Average (8)	Below average (6)
Content (10pt max.)	Topic was discussed thoroughly and sufficient information provided.	Topic was discussed well. One or more issues were not entirely clear.	Discussion of the topic enabled a broad understanding leaving a number of unanswered questions.
Delivery/Organization (10pt max.)	Well prepared. Slides were clear. The presenter answered all questions.	Minor aspects of the presentation (visual or verbal) were not clear.	Presentation lacked clarity

Course Schedule

Date	**Lecture Title**	**Book Chapter**
1/28	Introduction and Presentation Assignment	
2/4	Fundamentals of Neuropharmacology	Ch. 1
2/11	Cellular Basis of Communication	Ch. 2
2/18	Synaptic Transmission	Ch.3
2/25	Signal Transduction in the Brain	Ch.4

3/4	Excitatory and Inhibitory Amino Acids	Ch. 5
3/11	Widely Projecting Systems: Monoamines and Acetylcholine	Ch. 6
3/18	Neural and neuroendocrine control	Ch. 10
3/25	**Exam 1**	**Ch. 1-6, 10**
4/1	Higher cognitive function and behavioral control	Ch. 13
4/8	Mood and emotion	Ch. 14
4/15	Reinforcement and addictive disorders	Ch. 15
4/22	Schizophrenia and other psychoses	Ch. 16
4/29	Neurodegeneration	Ch. 17
5/6	**Exam 2**	**Ch. 13-17**

Exams:

- Exams will be administered via Blackboard on the scheduled day at 10AM and you will have until 3PM to complete.
- Make up exams are not permitted.
- Exams will consist of ~50 multiple-choice/True/False questions
- Exams are not open book and you must follow the guidelines of the GMU Honor Code.

Guidelines on the Presentation:

The article presentation portion of the course is intended to help the student gain insight into the current literature and become familiar with trends in the field of neuropharmacology. Articles are related to topics discussed during the lecture portion of the course. In assigning each of you an article to present, you will also have a chance to learn from each other. My expectation is that each presentation will contain sufficient background information to enable everyone to follow the details of the presented article. In many cases this will require that you delve into the literature from sources outside of the article. It is my expectation that we as a group can discuss the article and this requires that we have all read it prior to class. Here are some guidelines:

1. A computer with Internet access will be available so bring your complete presentation on a flash drive or access it via Mason log in the day of the presentation. In my experience this process can take longer than planned so it is best you come early the day of your presentation and make sure you file is ready to upload.
2. Each presentation should last approximately 45. This does not include the time needed for Q&A and discussion.
3. Try to foster interaction during your presentation by critically evoking key points for discussion. This means going beyond just stating the results.
4. Visual aids including illustrations, graphs, and videos are useful during a presentation.

Presentation Schedule

Date	Article	Presenter
1/28	----	----
2/4	COVID-19 vaccines: The status and perspectives in delivery points of view.	**Kevin**
2/11	1. Alpha7 nicotinic acetylcholine receptor is required for amyloid pathology in brain endothelial cells induced by Glycoprotein 120, methamphetamine and nicotine 2. Sleep regulation of the distribution of cortical firing rates	**Liz Holden**
2/18	1. Sperm channel diversity and functional multiplicity 2. Viral pathogenesis of SARS-CoV-2 infection and male reproductive health	**Alex P**
2/25	Axonal Damage Revealed by Accumulation of APP in HIV individuals	**Alex B**
3/4	1. Insights Into the Proteomic Profiling of Extracellular Vesicles for the Identification of Early Biomarkers of Neurodegeneration 2. Evaluation of neonicotinoid insecticides for oestrogenic, thyroidogenic and adipogenic activity reveals imidacloprid causes lipid accumulation	**Carson Bonnie H**
3/11	Space and time: The hippocampus as a sequence generator	**Michelle**
3/18	Signatures of sex: sex differences in gene expression in the vertebrate brain	**Will**
4/1	Cellular Basis of Working Memory	**Aya**
4/8	Vascular CaMKII: heart and brain in your arteries	**Rania**
4/15	Opioid receptor, social behaviour and autism spectrum disorder: reward matters	**Lucas**
4/22	MeCP2 and Chromatin Compartmentalization	**Bailey**
4/29	Complement System in Brain	**Danielle**