

BIO 337
NEUROTRANSMISSION & NEUROMODULATION

Class meets on Mondays and Fridays from 1:00 to 2:20 p.m. in Melville Library W4550

Instructors: Dr. Arianna Maffei (course director), Dr. Lonnie Wollmuth

Guest Instructors: Dr. Lorna Role, Dr. Alfredo Fontanini, Dr. David Talmage

Department of Neurobiology and Behavior

TA: Kelvin Chan, Graduate Program in Neuroscience, Department of Neurobiology and Behavior

uTA: Timur Mukhammadov, Undergraduate Biology, Neuroscience Specialization

Readings: Introduction to Neuropsychopharmacology by Leslie L. Iversen, Susan D. Iversen, Floyd E. Bloom, Robert H. Roth, Oxford University Press

CLASS SCHEDULE

Date	Instructor	Topic
1. Monday 01/22	Wollmuth	Introduction
2. Friday 01/26	Wollmuth	Membrane excitability
3. Monday 01/29	Wollmuth	Cell-to-cell signaling
4. Friday 02/02	Wollmuth	Amino acid transmitters
5. Monday 02/05	Wollmuth	Local networks
6. Friday 02/09	Wollmuth	Dysfunction of excitability: Epilepsy
7. Monday 02/12	Wollmuth	Slow synaptic modulation
8. Friday 02/16	Wollmuth	Catecholamines
9. Monday 02/19	Wollmuth	Synaptic plasticity
Friday 02/23	Exam 1 (Lectures 1-9, Wollmuth and Maffei)	
10. Monday 02/26	Wollmuth	Parkinson's Disease
11. Friday 03/02	Wollmuth	The neurobiology of addictive behaviors
12. Monday 03/05	Maffei	Stimulants and the brain
13. Friday 03/09	Maffei	Mood regulators
Spring Break		
14. Monday 03/19	Maffei	Affective disorders
15. Friday 03/23	Maffei	Opioids
16. Monday 03/26	Role	The most versatile of neurotransmitters: Acetylcholine
17. Friday 03/30	Maffei	Other neuronal signals
18. Monday 04/02	Maffei	How do we study brain, behavior and reward?
Friday 04/06	Exam 2 (Lectures 10-18, Wollmuth and Maffei)	
19. Monday 04/09	Maffei	The neurobiology of taste and eating disorders
20. Friday 04/13	Maffei	The neurobiology of fear
21. Monday 04/16	Maffei	The neurobiology of autism spectrum disorders
22. Friday 04/20	Maffei	Experimental approaches to autism spectrum disorders
23. Monday 04/23	Maffei	Alzheimer's Disease
24. Friday 04/27	Maffei	Experimental approaches to Alzheimer's disease
25. Monday 04/30	Talmage	Schizophrenia
26. Friday 05/04	Maffei	Experimental approaches to schizophrenia
Tuesday 05/14	Exam 3 (Lectures 18-26, Wollmuth and Maffei)	
	Time: 2:15pm – 5:00pm, Room: Javits 103	

Office Hours:**Dr. Arianna Maffei**

Life Science Room 536 or 546
Wednesdays 9:00 am to 11:00 am
Other times by appointment
Email: arianna.maffei@stonybrook.edu

Dr. Lonnie Wollmuth

Center for Molecular Medicine Room 334
Monday 3:00 pm to 4:00 pm
Other times by appointment
Email: lonnie.wollmuth@stonybrook.edu

TA: Kelvin Chan

Life Sciences 5th Floor Graduate Student Lounge
Office hours: Tuesday 10:00am -11:00am
Other times by appointment
Email: kelvin.chan@stonybrookmedicine.edu

uTA: Timur Mukhammadov

Life Sciences 056
Office Hours: Wednesday and Thursday 12:00 – 1:00pm
Email: timur.mukhammadov@stonybrook.edu

Guest Instructors: Dr. Lorna Role: lorna.role@stonybrook.edu

Dr. David Talmage: david.talmage@stonybrook.edu

Upon completion of BIO 337, students will be able to:

1. Describe the general principles of cell signaling in the central nervous system (Lectures 1-3).
2. Explain the interrelationships between resting membrane potential, action potentials, and excitatory and inhibitory inputs (Lectures 4-5).
3. Describe how G-protein coupled receptors overlays and modulates the activity of fast signaling pathways. (Lectures 1-7)
4. Describe how various disease states of the brain including epilepsy, Parkinson's Disease, and addiction modify and disrupt normal signaling in the brain. (Lectures 8-12)
5. Describe how specific neurotransmitter systems, specifically those arising from the brain stem, regulate brain function. (Lectures 6-14 and Lectures 17-18)
6. Describe basic principles of experimental approaches to the study of healthy brain function and disease (Lectures 15-16)
7. Describe which basic neuronal function, brain signaling mechanisms and neurotransmitter systems are altered in a number of neurological disorders (Lectures 19 -24)
8. Explain current experimental approaches to the study of neurological conditions (Lectures 20 – 24)

Exams and Grading

The exams for the course consist of 2 midterm Exams and 1 Final organized in multiple choice questions.

Exams 1, 2 and 3 will not be cumulative but will focus on the material dealing with the indicated sections of the course. Each exam will equally contribute to the final grade. The exams and answer keys will be posted on the BIO 337 Blackboard site. Make-up exams are offered (see **Absences**), but will be in a different format (e.g. short answer questions). Final grades may be influenced by participation in class and in review sessions. The ranges for grading will be A: 100-90%; B: 89.9-80%; C: 79.9-60%.

For all sections there will be optional take-home problem sets. *Rules & regulations for short answer questions for Bio 337.* 1- While these questions are optional, answering questions correctly will allow to gain 1 extra point/take home set to be added to the grade of the corresponding midterm exam. 2- The questions will be posted after the lecture. You have to turn in or e-mail your answers to the TAs before the start of the next lecture. 3- The answer key will be posted after the subsequent lecture. 4- The TA will grade your exam but will not hand it back to you.

Absences and Make-up Exams: Should you miss an exam you must contact Prof. Maffei within 48 hours of the exam in order to qualify for a make-up exam. You must provide a physician's note before a makeup can be administered. All other excuses need to be approved by Prof. Maffei. Otherwise, you will receive a zero for each exam missed. The make-up exam will be given immediately after the third (final) exam, and within the allotted time during final exams week. Anyone with **excused** absences for the final exam exams will receive a grade of Incomplete (I) in the course, and the remaining make-up exam will be scheduled on a specified date early in the following semester. Anyone missing more than 2 exams will need to re-take the course.

Appeal Process: After the exam results are posted you may appeal the grading of individual questions. To do so you must provide a short, respectful and neatly written explanation of the basis of your appeal. If you do not provide a cogent appeal it will not be reviewed. The appeal must be received no later than 48 hours after the exam grades are posted. All appeals turned in at a later time will be declined. The appeal is your opportunity to indicate questions that you think are ambiguous or unfair. If your criticisms are justified in the judgment of the faculty, credit will be given for acceptable answers.

Description and schedule of Required Readings and/or Assignments.

Each lecturer will hold regular office hours during their part of the course to answer questions regarding lectures and administration. Additionally, there will be review sessions held by an advanced Graduate TA, to be determined. Students are strongly encouraged to take advantage of these opportunities.

Textbooks: The textbooks are recommended but not required. Both the University Bookstore and Stony Books have copies of the book.

CLASS PROTOCOL

Cell phones should be turned off during lectures and readings. Laptop computers may be used to take notes. Internet surfing/texting during lecture is not allowed

CLASS RESOURCES

Blackboard: You are expected to check the BIO 337 Blackboard site for posting of handouts or messages. The website is <http://blackboard.stonybrook.edu>. If there are any problems with access/speed to Blackboard, please let DoIT know immediately. It is there responsibility to maintain these facilities for educational purposes.

DISABILITY SUPPORT SERVICES (DSS)

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>]

ACADEMIC INTEGRITY

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at <http://www.stonybrook.edu/uaa/academicjudiciary/>

CRITICAL INCIDENT MANAGEMENT

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.