

COURSE TITLE: ADVANCED NEUROBIOLOGY 2

COURSE CATALOG CODE AND SECTION NUMBER: 01:146;447

SEMESTER: SPRING

COURSE INSTRUCTOR AND CONTACT INFORMATION

Course Director: Martin Grumet, PhD mgrumet@dls.rutgers.edu

Course Faculty: Wise Young, MD/PhD wisey@dls.rutgers.edu

COURSE MEETING DAYS, TIMES, LOCATION, MODALITY

This course will be conducted in person on Tuesday and Thursday from 2:00- 3:20 PM in SEC118. Lectures will be recorded and posted on Canvas.

OFFICE HOURS / STUDENT SUPPORT HOURS

Office hours for Dr. Grumet are scheduled for Tuesdays from 11:00 AM to 12:00 PM and Thursdays from 3:30-4:30 PM. Schedules for Dr. Young will be indicated later. You are encouraged to make an appointment, but walk-ins may be accommodated if possible.

COURSE DESCRIPTION

This course focuses on development and function of the central nervous system with an emphasis on diseases and disorders. It has 4 modules: 1) neurodevelopment, demyelination, tumors and viral infections; 2) neurological disorder/diseases; 3) injury to the spinal cord and brain and repair, mononuclear transplants; 4) prions, clinical trials and future of spinal cord and brain trauma.

Classes will focus on:

- Development of the nervous systems and the role of stem cells.
- CNS Disorders including demyelination, Down syndrome, ALS, cancer, and viral infections.
- Spinal cord injury and neurotrauma, and mononuclear transplants.
- Prions, and ethical clinical trial design.

This course typically has over 100 students. Lectures will include breaks to allow for questions, but class participation will not be graded. The course is divided into four modules, two each will be taught by Drs. Martin Grumet and Wise Young.

REQUIRED TEXTS AND COURSE MATERIALS

There is no text for the course. Lecture notes will be posted on Canvas before class. Lectures will be recorded and made available on Canvas. Suggested text for background is MOLECULAR CELL BIOLOGY, by Lodish, 8th Edition (ISBN-13:978-1-319-04387-2). All course materials are copyrighted by the University and the individual instructors. Unauthorized distribution of these materials could violate the University Academic Integrity Policy and may subject you to disciplinary action

TECHNICAL / TECHNOLOGY REQUIREMENTS

Students are invited to visit Rutgers Student Tech Guide website for resources:
<https://it.rutgers.edu/technology-guide/students/#new-brunswick>

If you do not have the appropriate technology for financial reasons, please email the Dean of Students at deanofstudents@echo.rutgers.edu for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid:
<https://financialaid.rutgers.edu/>.

LEARNING GOALS

Course and Department Learning Goals

The learning goals for this course are consistent with general goals set by the Department of Cell Biology and Neuroscience, as well as the Division of Life Sciences. They include:

- Master factual and conceptual knowledge in neurodevelopment, neurotrauma, nervous system disorders and cell transplantation that will provide a solid foundation for success in advanced training and professional careers.
- Develop an ability to summarize, integrate and organize complex information.
- Develop an ability to use scientific reasoning to evaluate the potential for current research and new discoveries to improve our understanding of treating nervous system functions and disorders and its relevance to human health and to our society.

GRADING SCALE

- A 90.00-100%
- B+ 85.00-89.99%
- B 80.00-84.99%
- C+ 75.00-79.99%
- C 67.00-74.99%
- D 60.00-66.99%
- F <60.00%

ASSESSMENT / GRADING COMPONENTS

The course is divided into 4 modules and there will be an 80-minute exam following each module. The first three exams will be given in the times assigned for the course. The schedule for the final exam will be announced when it is assigned. Each of the exams will constitute 25% of your grade. The exams may include diagrams relating to some of the questions. The types of questions will include multiple choice and true/false. Time is devoted to review before each exam.

SCHEDULE OF TOPICS

Module	Date	Lecturer	Topic
1			CNS Development, Stem cells and Disease
1.1	1/17	Grumet	Course Introduction & Intro to NSC
1.2	1/19	Grumet	Early Development & Neural Cells
1.3	1/24	Grumet	CNS & Neuronal Development
1.4	1/26	Grumet	Neural stem cells, Lineage & iPS
1.5	1/31	Alder	Neurotrophins in regeneration and plasticity
1.6	2/2	Grumet	Cancer Stem Cells and Review for Exam 1
	2/7	Grumet	Module 1 Exam 1
2.1	2/9	Grumet	Immunological Basis of Neural Disorders.
2.2	2/14	Grumet	Intracellular Transport Mechanisms in Normal Neurons and Disease
2.3	2/16	Grumet	ALS is a Neurodegenerative Disease
2.4	2/21	Grumet	Alzheimer's Disease
2.5	2/23	Grumet	TBD
2.6	2/28	Grumet	Effects of Zika, Long Covid and Review for Exam 2
	3/2		Exam 2
3.1	3/7	Young	Introduction to brain and spinal cord injury research
			SPRING BREAK March 11-19
3.2	3/21	Young	Regeneration of the brain and spinal cord
3.3	3/23	Young	Brain injury –trauma, stroke, and cardiac arrest
3.4	3/28	Young	Neonatal Hypoxic-ischemia, mononuclear cell, and exosome therapy
3.5	3/30	Young	Down Syndrome, Neurogenesis, and Lithium therapy
3.6	4/4	Young	Mononuclear cell transplants & exercise therapy for chronic complete SCI
3.7	4/6	Young	Mononuclear cell infusion & exosome therapy to stimulate neurogenesis
	4/11	Young	Exam 3
4.1	4/13	Young	What are prions and what do they do?
4.2	4/18	Young	Prion diseases of the brain and eye
4.3	4/20	Young	Treatments of Prion diseases
4.4	4/25	Young	Clinical Trials – Ethics
4.5	4/27	Young	The immune system and the CNS
4.6	5/1	Young	The future of brain and spinal cord injury research
	TBD		Final Exam

POLICIES

Attendance and Participation

Attendance is expected for all classes. Students are expected to take exams on time. If you anticipate difficulty in taking an exam, you must report absences using the University self-reporting absence system: <https://sims.rutgers.edu/ssra/>. You may be able to take a make-up exam with a documented absence indicating the date and reason for your absence. An email is automatically sent to the course director. If you anticipate missing an exam because of an interview or other important matter, you should also speak to Dr. Martin Grumet in advance.

You should be familiar with Rutgers policy on attendance and cancellation of classes: <https://sasundergrad.rutgers.edu/degree-requirements/policies/attendance-and-cancellation-of-classes>. Students who have a prolonged health and/or financial issues that are impacting their academics and well-being over an extended period of time to contact the Dean of Students at deanofstudents@echo.rutgers.edu. The Dean of Students may provide the instructor with a letter requesting flexibility.

Disability Accommodations

Students in need of disability accommodations should register for accommodations and consult the policies and procedures of the Office of Disability Services website: <https://ods.rutgers.edu>

In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation.

ACADEMIC INTEGRITY POLICY

You should be familiar with University website on Academic Integrity: <http://nbacademicintegrity.rutgers.edu/>

Students are required to take the *Honor Pledge*:

"On my honor, I pledge that I have neither given nor received any unauthorized aid on this (exam, test, paper)."

Rutgers University takes academic dishonesty very seriously. By enrolling in this course, you assume responsibility for familiarizing yourself with the Academic Integrity Policy and the possible penalties (including suspension and expulsion) for violating the policy. As per the policy, all suspected violations will be reported to the Office of Student Conduct. Academic dishonesty includes (but is not limited to):

- *Cheating*
- *Plagiarism*
- *Aiding others in committing a violation or allowing others to use your work*
- *Failure to cite sources correctly*
- *Fabrication*
- *Using another person's ideas or words without attribution, including re-using a previous assignment*
- *Unauthorized collaboration*
- *Sabotaging another student's work*

If you are ever in doubt, consult your instructor.

STUDENT SUPPORT AND MENTAL WELLNESS

You should provide a list of Rutgers resources on your syllabus and on your Canvas site to support students in their academic success and mental wellness.

- Student Success Essentials: <https://success.rutgers.edu>
- Student Support Services: <https://www.rutgers.edu/academics/student-support>
- The Learning Centers: <https://rlc.rutgers.edu/>
- The Writing Centers (including Tutoring and Writing Coaching): <https://writingctr.rutgers.edu>
- Rutgers Libraries: <https://www.libraries.rutgers.edu/>
- Office of Veteran and Military Programs and Services: <https://veterans.rutgers.edu>
- Student Health Services: <http://health.rutgers.edu/>
- Counseling, Alcohol and Other Drug Assistance Program & Psychiatric Services (CAPS): <http://health.rutgers.edu/medical-counseling-services/counseling/>

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/

www.rhscaps.rutgers.edu/ CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Crisis Intervention: <http://health.rutgers.edu/medical-counseling-services/counseling/crisis-intervention/>

Report a Concern: <http://health.rutgers.edu/do-something-to-help/> **Violence Prevention & Victim Assistance (VPVA)**

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 /

www.vpva.rutgers.edu/ The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.