

Chemistry 676: Neurochemistry

Instructor:	Dr. Kelly Drew
Office/office hrs:	Murie 223F, MWF 10-12:00
Telephone:	474- 7190
e-mail:	kdrew@alaska.edu
Lecture:	TR, 9:45-11:15, Reichardt Room 138
Homework:	<p>Assignments posted on course schedule are due at the beginning of the next class unless otherwise indicated. Homework turned in after the deadline will not be accepted unless arrangements are made before the homework is late.</p> <p>See schedule for when homework is due. Permission to hand-in HW via e-mail may be arranged in advance and will not be accepted without prior arrangements.</p> <p>Homework and reading assignments (other than from the text book) will be posted on blackboard</p>
Home-work make-up:	Attend neuroscience seminars. A write-up about a seminar will substitute for one HW assignment (peer-reviews of selected articles). Up to 3 HW assignments can be substituted by a seminar write-up.
Course Description:	<p>This course is designed to teach graduate students critical thinking skills and experimental design in basic and applied aspects of interneuronal signaling. Lectures will be based on chapters from assigned text as well as current literature relevant to these topics. Critical thinking skills and experimental design will be taught through discussion of original research papers that relate to the lecture topic.</p> <p>Prerequisite: BIOL B417, CHEM F470 or equivalent instruction in basic cell and molecular biology and nervous system function.</p>
Course Goals:	Students should learn to identify significant research questions related to inter-neuronal communication and learn to perform at the level of an independent investigator in critical analysis of peer-reviewed literature in neurochemistry and in written and oral communication of the strengths and weaknesses of hypothesis driven research in the area of neurochemistry.
Student Learning Outcomes	<p>Written homework, group project and final project assignments will be used to assess</p> <ul style="list-style-type: none"> • Familiarity with current literature related to functions and diseases associated with neurotransmitter/neuromodulator • Ability to critically evaluate published papers and to prepare written comments addressing limitations to experimental design, experimental approach and interpretation of results. • Ability to suggest means to improve a manuscript that are sufficient and appropriate to submit as comments to authors when invited to peer review a manuscript. • Ability to formulate a hypothesis and devise an experiment to test that hypothesis. <p>Exams and quizzes will be used to assess understanding of</p> <ul style="list-style-type: none"> • Detailed mechanisms of neurochemical transmission and the ability to design experiments to test hypotheses regarding these mechanisms and the physiological functions related to these processes. <ul style="list-style-type: none"> ➤ Synthesis ➤ Storage ➤ Regulated release ➤ Receptor subtypes and effectors ➤ Termination of effect ➤ Basic neurochemical anatomy of transmitter systems <p>(Homework) Students will be guided by the instructor through critical evaluation of peer-reviewed papers to achieve the following objectives:</p> <ul style="list-style-type: none"> • Apply knowledge of neurochemical transmission to interpretation of peer reviewed papers. • Apply knowledge of neurochemistry and experimental design to critically evaluate original research papers and literature reviews. • Develop critical thinking skills and oral and written communication styles to defend one's own interpretation of the data. • Know how to prepare comments for authors to be submitted in response to an invitation by a journal editor to review a manuscript. <p>(Group project assignment) Students will gain practice with oral presentations of original research towards the following objectives:</p> <ul style="list-style-type: none"> • Become familiar with original literature related to a topic of interest in neurochemistry

	<ul style="list-style-type: none"> • Develop effective techniques for oral presentation of original research • Develop effective techniques for optimizing positive group dynamics and productivity as a team player and as a group leader.
Instructional Methods	Instructional methods will consist of about 40% traditional lecture on material from the text book and 60% discussion and interpretation of peer-reviewed literature.
Text:	Basic Neurochemistry: Molecular, Cellular and Medical Aspects by George J. Siegel (Editor), 8th edition.
Other Required Reading:	Original research and review articles as assigned
Exams and Grading:	Exams and quizzes will typically consist of a subset of review questions provided in class. There will be no make-up exams or quizzes except under extreme circumstances. If such circumstances arise notify Dr. Drew (474-7190) before the scheduled time of the exam. If a make-up exam is approved it must be completed within 1 week of the original exam. Any student suspected by the instructor of cheating on a quiz or exam may be assigned a course grade of F; course drop forms will not be signed in these cases. The letter grades assigned will be based on the overall performance of the class but will usually be in the range 90-100=A, 80-90=B, 70-79=C, 60-69=D, and below 60 is failing.
Drop a quiz option	Students may attend up to 3 online seminars at http://neuroseries.info.nih.gov/ and write a critical review of each presentation addressing areas for improvement in slide formatting/graphics, development of background and significance appropriate for the audience, communication of a hypothesis and overall rigor of experimental design, clarity of results, soundness of interpretation and discussion of caveats that limit interpretation or application of research findings. These 3 critical reviews may substitute for one quiz grade.
Final Project	A final project will be an opinion paper of an emerging research focus area in neurochemistry that the student can defend as innovative. The opinion paper will be a critical review of at least 5 seminal papers on this topic that informs the reader of the topic and why it is innovative and addresses how well a fundamental principle, chosen by the student, is represented in the work.
Disabilities	Students with a physical or learning disability are required to identify themselves to Mary Matthews (474-5655) in the Disability Services office, located in the Center for Health and Counseling. The student must provide documentation of the disability. Disability Services will then notify Prof. Drew of special arrangements for taking tests, working homework assignments, and doing lab work.

Assignments for Chemistry 675

2 Exams (50 pts ea.)	100 pts
3 Quizzes or 2 quizzes + optional (25 pts ea.)	75 pts
Presentations of original research papers	100 pts
Comprehensive final exam	100 pts
Homework (10 pts ea.) + 10peer review	~300 pts
Final Project (100 pts)	<u>100 pts</u>