Chemistry 676: Neurochemistry

Instructor:	Dr. Kelly Drew
Office/office hrs:	Murie 223F, MWF 10-12:00
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Lecture:	TR, 9:45-11:15, Murie 103
Perusall	Create a Perusall account and enter your course code **DREW-3ND2B** upon registration.
Blackboard	CHEM F474 F676 Stacked 2002103 (CRN 74666, 74670) Neurochemistry(CHEM_F474_F676_ST1_202103)
Schedule	https://docs.google.com/spreadsheets/d/1S9bcAjYE6ABcu2NCYMLwLWziBAwWL39_x2Gd748YaGw/edit#gid=0
Homework:	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. 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. Homework and reading assignments (other than from the text book) will be posted on blackboard
Home-work make-up:	Attend neuroscience seminars online at http://neuroseries.info.nih.gov/ or on campus. Check with the instructor to ask if the seminar will count as a neuroscience seminar). 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:	This course is designed to teach graduate students critical thinking skills and experimental design in basic and applied aspects of inter-cellular signaling in the CNS. 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. Prerequisite: BIOL B417, CHEM F470 or equivalent instruction in basic cell and molecular biology and nervous system function.
Course Goals:	Students should learn to identify significant research questions related to inter-cellular communication and be able to develop working models to answer these questions. Students should 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	Written homework, group project and final project assignments will be used to assess • 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 follow the logic of an original research paper, communicate take home messages from figures, identify a gap in knowledge that the paper fills, discuss alternative interpretations to papers primary findings and identify limitations to the study. • Ability to discuss rigor and reproducibility of study design and manuscript content. • Ability to critique graphical representation of data and concepts with regard to effective graphical communication.

	• Ability to identify metabolites, proteins and genes encoding proteins involved in intercellular communication as needed for omics informed pathway analysis. Exams and quizzes will be used to assess understanding of detailed mechanisms of intercellular communication in the CNS, general knowledge of approaches used to study intercellular communication and ability to interpret data related to the study of intercellular communication related to the following ➢ Synthesis ➢ Storage ➢ Regulated release ➢ Receptor subtypes and effectors ➢ Termination of effect ➢ Basic neurochemical anatomy and function of transmitter systems (Homework) Students will be guided by the instructor through critical evaluation of peer-reviewed papers to achieve the following objectives: • 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. (Presentations/Discussions) Students will gain practice with oral presentations of original research towards the following objectives: • Become familiar with original literature related to a topic of interest in neurochemistry • Develop effective techniques for oral presentation of original research Total points are calculated from a rubric (Presentation Rubric 8.12.2021.docx) provided to the students
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	For the final project each student will select one or more metabolomics, proteomic or genomic datasets relevant to neurochemistry and conduct both a targeted, hypothesis-driven and an untargeted pathway analysis related to neurotransmitter systems discussed in class. Students will present a formal presentation to include an introduction, methods/approach, results, conclusion and discussion. Total points are calculated from a rubric (Presentation Rubric 8.12.2021.docx).
Addendum	**COVID-19 statement**: Students should keep up-to-date on the university's policies, practices, and mandates related to COVID-19 by regularly checking this website: https://sites.google.com/alaska.edu/coronavirus/uaf?authuser=0 Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply. **Student protections statement**: UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. Graduate teaching assistants do not share the same reporting obligations. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site: https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/. **Disability services statement:** I will work with the Office of Disability Services to provide reasonable accommodation to students with disabilities. **Student Academic Support**: • Speaking Center (907-474-5470, uaf-speakingcenter@alaska.edu, Gruening 507) • Writing Center (907-474-5314, uaf-writing-center@alaska.edu, Gruening 8th floor) • UAF Math Services, uafmathstatlab@gmail.com, Chapman Building (for math fee paying students only) • Developmental Math Lab, Gruening 406 • The Debbie Moses Learning Center at CTC (907-455-2860, 604 Barnette St, Room 120, https://www.ctc.uaf.edu/student-services/student-success-center/) • For more information and resources, please see the Academic Advising Resource List (https://www.uaf.edu/advising/lr/SKM_364e19011717281.pdf) **Student Resources:** • Disability Services (907-474-5655, uaf-disability-services@alaska.edu, Whitaker 208) • Student Health & Counseling **[6 free counseling sessions]** (907-474-7043, https://www.uaf.edu/chc/appointments.php, Whitaker 203) • Center for Student Rights and Responsibilities (907-474-7317, uaf-studentrights@alaska.edu, Eielson 110) • Associated Students of the University of Alaska Fairbanks (ASUAF) or ASUAF Student Government (907-474-7355, asuaf.office@alaska.edu, Wood Center 119) **Nondiscrimination statement**: The University of Alaska is an affirmative action/equal opportunity employer and educational institution. The University of Alaska does not discriminate on the basis of race, religion, color, national origin, citizenship, age, sex, physical or mental disability, status as a protected veteran, marital status, changes in marital status, pregnancy, childbirth or related medical conditions, parenthood, sexual orientation, gender identity, political affiliation or belief, genetic information, or other legally protected status. The University's commitment to nondiscrimination, including against sex discrimination, applies to students, employees, and applicants for admission and employment. Contact information, applicable laws, and complaint procedures are included on UA's statement of

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Assignments for Chemistry 676

2 Quizzes (25 pts ea.)	50 pts
Presentations of original research papers (35pts each)	~175 pts
Comprehensive final exam	**100 pts**
Homework (15pts each)	~90 pts
Final Project (100 pts)	100 pts