Neurobiology of Aggression: Tuesday 1:35-5:05pm

Dr. Lesley Ricci  
Office 374 NI.  
Ext. 4682  
Email: l.ricci@neu.edu  
Office Hrs. Thursdays 11:45 am.- 1:00 pm.


COURSE OVERVIEW:  
Aggression is an evolutionarily beneficial behavioral act. Aggression is used to obtain resources, mates, territory and social status. In contrast, violent aggression is a source of socioeconomic burden in modern day society. A generally accepted definition of aggression consists of overt behavioral acts that are intended to inflict physical damage upon another individual. In this lab course we will examine neurobiological mechanisms underlying maladaptive aggressive behavior. We will use peer-review articles to address specific problems facing the field of research on aggression to guide our behavioral assessments of animal Resident-Intruder aggression testing. We will examine and manipulate immunohistochemical analyses of likely neurochemical modulators of aggressive displays using in-situ brain slices. Statistical analyses will then be conducted to highlight any of the relationships observed between behavioral expressions and underlying neural chemistry. Lastly we will integrate novel research findings with existing literature in the form of a formal scientific discussion, by examining plausible explanations of the data collected, to project future directional hypotheses for future studies.

EXPECTED OUTCOMES:  
At the conclusion of this lab course students should have a solid concept of research questions and design in the area of biological psychology (specifically those surrounding the topic of aggressive behavior). This course is a writing intensive course and as such students will learn to critically read peer review journals, construct valid research questions based on those articles and formulate hypotheses and research designs to answer them. Students will also become familiar with scientific writing as evaluated based on the completion of a scientific manuscript. Other topics that will be introduced so as to provide a fundamental knowledge base for students include, animal ethology, microbiology techniques, microscopy data collection, and molecular and behavioral data analysis.
LABORATORY EVALUATIONS:
The course will be divided into two sections for student evaluations. There will be a lecture component to the course, which will include (2) exams. The exams will account for 25% of the TOTAL grade for the course. There will be a lab component of the course, which will consist of 2 laboratory reports. The reports will be comprised of a brief (roughly 2 paragraphs) Introduction, Methods Section, Results Section and an Overall Discussion. Each lab report will consist of two drafts. The rough draft will be returned with comments and the second, final draft will be due the following week. Both drafts will be returned to you with comments and a score. The first and second drafts are averaged yielding one grade. Each of the 2 lab reports is worth 50% of the 100% possible for the laboratory grade. The average of your (2) lab report grades is worth 75% of the TOTAL grade for the course. Deadlines for each original and revision will be assigned.

Criteria for Lab Report grading are as follows: Each criterion will be scored from 1-5 with, 1 being the lowest score and 5 the highest. Each section of the lab reports will have a total of 20 possible points, such that each document has 80 for a 100% grade. See Below

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Topical Outline:

Week 1: September 13th-Introduction to the course and Syllabus review.

Lab- Introduction to R-I with Data. Practice Behavior Scoring

Week 3: September 27th- Lecture- AAS Behavior models, Ethology of aggression displays.
- Lab-Behavior.
Week 4: October 4th - Ethology of Aggression Offense vs. Defense and Neural Circuitry of the Anterior Hypothalamus.
Lab– Behavior Data and Analyses

Week 5: October 11th - Anatomical Localization of aggression areas (Observation)
Quiz 1 Behavior, Aggression and AAS
Lab-Introduction to Microscopy
Rough draft Lab Report 1

Week 6: October 18th
Lecture – Pharmacological Treatments of Aggressive Behavior:
Introduction to Serotonin and Dopamine: Cocaine, Aggression and Neurochemical Alterations

Week 7: October 25th - Lecture- Immunohistochemistry and Statistical Analyses.
Lab- Introduction to ICC and protocol formation.

Week 8: November 1st - Quiz 2. Cocaine, Aggression, Immunohistochemistry and Statistical Analyses.
Lab- Final draft Lab Report 1
Data Collection ICC

Week 9: November 8th
Lab- Data Collection ICC and analysis

Week 10: November 15th
-Lecture biology and behavior correlations
Lab- Rough draft Lab Report 2

Week 11: November 22nd
Lab- Individual lab report meetings

Week 12: November 29th - Lecture- Discussion of Final Lab Report
Draft 2 Final Lab Report 2

Week 13: December 6th - Final wrap up all data and reports.
LAST DAY OF CLASSES
Academic Honesty and Integrity Statement:
The University views academic dishonesty as one of the most serious offenses that a student can commit while in college and imposes appropriate punitive sanctions on violators. Here are some examples of academic dishonesty. While this is not an all-inclusive list, we hope this will help you to understand some of the things instructors look for and strongly recommend that you include the text below as part of your syllabus. The following is excerpted from the University’s policy on academic honesty and integrity; the complete policy is available at http://www.osccr.neu.edu/policy.html.

- **Cheating** – intentionally using or attempting to use unauthorized materials, information or study aids in an academic exercise. This may include use of unauthorized aids (notes, texts) or copying from another student’s exam, paper, computer disk, etc.

- **Fabrication** – intentional and unauthorized falsification, misrepresentation, or invention of any data, or citation in an academic exercise. Examples may include making up data for a research paper, altering the results of a lab experiment or survey, listing a citation for a source not used, or stating an opinion as a scientifically proven fact.

- **Plagiarism** – intentionally representing the words or ideas of another as one’s own in any academic exercise without providing proper documentation by source by way of a footnote, endnote or intertextual note.

- **Unauthorized collaboration** – Students, each claiming sole authorship, submit separate reports, which are substantially similar to one another. While several students may have the same source material, the analysis, interpretation and reporting of the data must be each individual’s.

- **Participation in academically dishonest activities** – Examples include stealing an exam, using a pre-written paper through mail order or other services, selling, loaning or otherwise distributing materials for the purpose of cheating, plagiarism, or other academically dishonest acts; alteration, theft, forgery, or destruction of the academic work of others.

- **Facilitating academic dishonesty** – Examples may include inaccurately listing someone as co-author of paper who did not contribute, sharing a take home exam, taking an exam or writing a paper for another student.