



BIOA 455

LABORATORY METHODS IN HORMONES & BEHAVIOR

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Office hours: by appointment

Lecture/Discussion Seminars: TTh 10:00 AM – 11:30 AM (RAI 116)

Lab Sections A/B: WED 9:30 AM – 12:30 PM / 1:30 PM – 4:30 PM (RAI 230)

Course Description

Introduction to human behavioral endocrinology, including practical and theoretical issues related to analysis of hormonal biomarkers in social and behavioral science research. No previous laboratory experience is required. This course fulfills UW Natural World (NW) General Education Requirements and is part of the Medical Anthropology and Global Health (MAGH) and Human Evolutionary Biology (HEB) Options in Anthropology. A lab fee is assessed to cover laboratory materials.

Learning objectives. *By the end of this course you should be able to:*

- Identify hormonal processes regulating stress, biorhythms, and aggressive and affiliative behaviors
- Demonstrate competency in basic wet lab methods (e.g. pipetting, dilutions and measurements)
- Understand principles & mechanisms of enzyme immunoassays to measure hormonal concentrations
- Execute a cortisol EIA from self-collected salivary samples, calculate diurnal cortisol slopes, and integrate and interpret results in relation to sleep, activity, and mood data
- Evaluate logistical considerations for ethical and biologically relevant biomarker collection & analysis
- Contextualize individual and population differences in hormonal measures in relation to broader social, developmental, and evolutionary contexts

Tentative summary of weekly lecture/lab topics (subject to change):

Week 0 (Sep 25 - 26)	Introduction to behavioral endocrinology / Laboratory safety
Week 1 (Oct 1 – 3)	Hormone-behavior interactions, endocrinology/ Basic lab skills 1
Week 2 (Oct 8 - 10)	Measuring behavior, stress responses / Basic lab skills 2
Week 3 (Oct 15 – 17)	Cortisol, testosterone, activity, and behavior/ Principles of enzyme immunoassays
Week 4 (Oct 22 – 24)	Homeostasis and biorhythms/ Urinary cortisol EIA demo
Week 5 (Oct 29 – 31)	LAB ALL WEEK: Urinary cortisol EIA practice
Week 6 (Nov 5 – 7)	Analyzing behavioral & biomarker data / EIA quality control & interpretations
Week 7 (Nov 12 – 14)	Applied readings & discussion / Saliva sample prep
Week 8 (Nov 19 – 21)	LAB ALL WEEK: Salivary cortisol EIA
Week 9 (Nov 26 – 28)	THANKSGIVING BREAK NO LECTURE OR LAB
Week 10 (Dec 3 – 5)	Applied readings & discussion / Workshopping results
Finals week (Dec 9)	Flash presentations of final project work (No final exam)

Required text: Nelson RJ & Kriegsfeld LJ. *Introduction to Behavioral Endocrinology*, 5th Edition. 2016.
Recommended: Sapolsky, RM. *Behave*. 2017. **Additional readings will be posted on Canvas.**

Course Assessment and Expectations

Assignments are grouped into four categories (summarized below). For **undergraduates**, categories are weighted accordingly for the final grade: Quizzes 40%; Lab assignments 30%; Final project 20%; Reading discussions 10%. Categories for **graduates** are weighted as follows: Quizzes: 25%; Lab assignments 25%; Final project 40%; Reading discussions 10%. Graduate students are also responsible for all recommended & supplementary readings. **See Canvas for complete and detailed descriptions of all assignments, assessments, readings, & due dates:**

Quizzes (100 points total). All quizzes are take-home, online (including midterm)

- 10 points: Lab Quiz 1 (Basic skills & safety)
- 15 points: Lab Quiz 2 (Dilutions & measurement)
- 15 points: Principles and methods of EIA quiz
- 60 points: Hormones & Behavior midterm

Lab assignments (100 points total)

- 10 points: Online trainings
- 10 points: Assay protocol & plate template (urine samples)
- 30 points: Urinary cortisol EIA results & mini-report
- 10 points: Assay protocol & plate template
- 30 points: Salivary cortisol EIA & mini-report
- 10 points: Lab notebook 10 pts (10% of group)

Reading discussions (100 points total)

- 50 points: Canvas discussion questions posted for Week 7 readings
- 50 points: Canvas discussion questions posted for Week 10 readings

Final project (100 points total)

- 60 points: Hormonal and behavioral data collection
 - 25 pts online survey & diary completion
 - 25 pts Actiwatch completion
 - 10 pts salivary sampling
- 40 points: Final report
 - Qualitative analysis/write-up 15 pts
 - Quantitative analysis/write-up 15 pts
 - Flash presentation 10 pts

The following grading scale will be used for final grades:

Percent = Grade

95 = 4.0 88 = 3.3 81 = 2.6 74 = 1.9 67 = 1.2

94 = 3.9 87 = 3.2 80 = 2.5 73 = 1.8 66 = 1.1

93 = 3.8 86 = 3.1 79 = 2.4 72 = 1.7 65 = 1.0

92 = 3.7 85 = 3.0 78 = 2.3 71 = 1.6 64 = 0.9

91 = 3.6 84 = 2.9 77 = 2.2 70 = 1.5 63 = 0.8

90 = 3.5 83 = 2.8 76 = 2.1 69 = 1.4 60-62 = 0.7

89 = 3.4 82 = 2.7 75 = 2.0 68 = 1.3 <60 = 0.0

*******ESSENTIAL INFORMATION*******

Because of the extensive safety protocols and iterative training required to conduct lab work, you must complete and/or demonstrate competency in key areas in order to progress to subsequent training stages. **You MUST complete online safety trainings to conduct any lab work. There are NO make-up opportunities for missed lab sessions.** Missing a lab section may prevent you from participating any further in lab training or assignments. This course requires a substantial time commitment in and outside of dedicated class time. Do not take this course if you anticipate scheduling or other conflicts.

The following are required in order to conduct urinary and salivary cortisol EIA:

- Pass Lab Quiz 1 and 2 with 75% or greater
- Attend the EIA demo in Week 4
- Self-collect saliva samples and pre-prep samples in Week 7
- Arrange extra lab time on Tuesday/Thursday of Weeks 5 and 8 as necessary to complete steps for Day 1 and Day 3 of the cortisol EIA protocol (to be discussed further in class).

Course policies

a. Academic misconduct: The university's policy on plagiarism and academic misconduct is a part of the Student Conduct Code, which cites the definition of academic misconduct in the [WAC 478-121](#). (WAC is an abbreviation for the Washington Administrative Code, the set of state regulations for the university. The entire chapter of the WAC on the student conduct code is [here](#).) According to this section of the WAC, academic misconduct includes:

“Cheating”—such as “unauthorized assistance in taking quizzes”, “Falsification” “which is the intentional use or submission of falsified data, records, or other information including, but not limited to, records of internship or practicum experiences or attendance at any required event(s), or scholarly research”; and “Plagiarism” which includes “[t]he use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment.”

The UW Libraries have a useful guide for students at <http://www.lib.washington.edu/teaching/plagiarism>

b. Accommodation: Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. The website for the [DRO](#) provides other resources for students and faculty for making accommodations.

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy (<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>). Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form (<https://registrar.washington.edu/students/religious-accommodations-request/>).

c. Communication: you can arrange to meet with me by appointment in my office or via skype/zoom/gchat outside of posted office hours. Practice [professional communication in your correspondence](#): use your uw.edu email address, employ proper salutations (Dr. or Prof. Martin) and sign-offs, don't write in textspeak or emojis,

and make sure you are not asking a question that is answered in the syllabus, on Canvas, or with a quick search. I will respond to emails within 48 hours. If you need to urgently communicate with me, please add *urgent* to the subject line.

d. Make-up work for online assignments: quizzes and other online assignments will be penalized 10% for every day late, and accepted only up to five days past the due date. There is no extra-credit option offered in this course. Some assignments must be completed to proceed with lab training, and there will be no make-up options for missed lab sections (see above).

e. Inclusivity: Among the core values of the university are inclusivity and diversity, regardless of race, gender, income, ability, beliefs, and other ways that people distinguish themselves and others. If any assignments and activities are not accessible to you, please contact me so we can make arrangements to make an alternative assignment available.

Learning often involves the exchange of ideas. To include everyone in the learning process, we expect you will demonstrate respect, politeness, reasonableness, and willingness to listen to others at all times – even when passions run high. Behaviors must support learning, understanding, and scholarship. Preventing violence is a shared responsibility in which everyone at the UW plays apart.

If you experience harassment during your studies, please report it to the SafeCampus website (anonymous reports are possible, [washington.edu/safecampus/](http://www.washington.edu/safecampus/)). SafeCampus provides information on counseling and safety resources, University policies, and violence reporting requirements help us maintain a safe personal, work and learning environment.

HELPFUL RESOURCES

- Support with quantitative interpretation and analysis is available through drop-in statistical support at the [Center for Statistics and the Social Sciences](#)
- Contact the [Counseling Center](#) (401 Schmitz Hall, 206-543-1240) for confidential counseling for stress, anxiety, depression and relationship problems. The Counseling Center also offers career counseling, to help you clarify a major or identify career interests.
- Call the Mental Health Clinic at Hall Health (206-583-1551) for same day and next day support and other psychiatric services. UW resources for [Emergency food or aid](#)