Welcome to NROC63

Neuroscience Laboratory

Team:

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Course objectives:

- introduction to behavioral work
- working with animals
- gain research experience

Mandatory Training Requirement:

The following components are mandatory for you to stay in the course
→ make sure to complete them**!**

- ✓ animal ethics lecture with David Hanwell, University Veterinary Surgeon:
  September 14th 10-11:30am, SW316
  → you have to pass the quiz at the end of the lecture!

- ✓ Animal handling training with Kim Kovasci, Vivarium Veterinary Technician:

- **September 9th 12:30 - 2pm**
- **September 9th 2 - 3:30pm**
- **September 15th 12:30 - 2pm**
- **September 15th 2 - 3:30pm**

Access to vivarium:

- access via fob to the vivarium will be given after successful completion of mandatory training sessions
- fob will be provided in exchange for $20 deposit
- fob **must** be returned to me after the last behavioral testing, before **December 2nd**, to get your deposit back
- no access to vivarium facility and behavioral testing rooms for individuals outside of NROC63!

Evaluation:

- **Objective 1: Developing knowledge of, and experience with behavioral techniques in neuroscience**

• Lab Performance (30% of overall grade)

→ Attendance at each lecture/lab (5%) → mandatory and important

→ Lab work (25%)
demonstration of skill, responsibility and punctuality in running behavioral procedures
→ will be awarded in consultation with Kim and TAs
→ "selfies" for proof of attendance

- **Objective 2: Developing knowledge of relevant research literature**

• Mini Literature Review (20% of overall grade)

→ Mini review (10%) due **October 9th**

Compare and contrast the validity of two pre-clinical (pharmacological) models of schizophrenia, focusing on the neurobiology and behavioral consequences of administering the following substances:
* Ketamine vs. Phencyclidine
* Ketamine vs. MK801
* Ketamine vs. Amphetamine
→ 2x3 groups (4 students each) to review each pair of agents

→ Group presentation (10%) due **October 26th**

15min presentation in your group, including:
- brief overview of literature review (what's known already?)
- identification of gap in research (what don't we know?)
- brief research proposal (what should be done next?)

- **Objective 3: Developing skills to critically evaluate a scientific paper**

- Test of 90 min in class (10% of overall grade), on **October 19th**

  → Questions about assigned Animal Use Protocol and assigned paper

- **Objective 4: To practice writing a scientific manuscript**

- Research paper (40% of overall grade)

  → written in the format of a journal paper (Neuropsychopharmacology)

  ✓ Introduction and Methods (10%) – due **November 11th**

  ✓ Results and Figures (10%) – due **November 18th**
  → reporting the results of the delayed match to place task or Morris Water Maze task (groups will be assigned)

  ✓ Final paper (20%) – due **December 2nd**
  → complete paper: Title, Abstract, Introduction, Methods, Results, Discussion, References, Figure Legends and Figures

Research Project

- You will be investigating the effects of repeated ketamine administration upon incentive motivation and memory

- Repeated ketamine administration is well-established pharmacological model of schizophrenia (in animals and humans!)

- But there's no standardization of the regimen protocol

- LiMBiC (ITO) lab has been collecting data over past 3 years to assess the effect of different ketamine dosing regimens on novelty processing and cognition

  → ketamine regiment used in this course showed interesting behavioral effects (Schumacher et al, 2016)

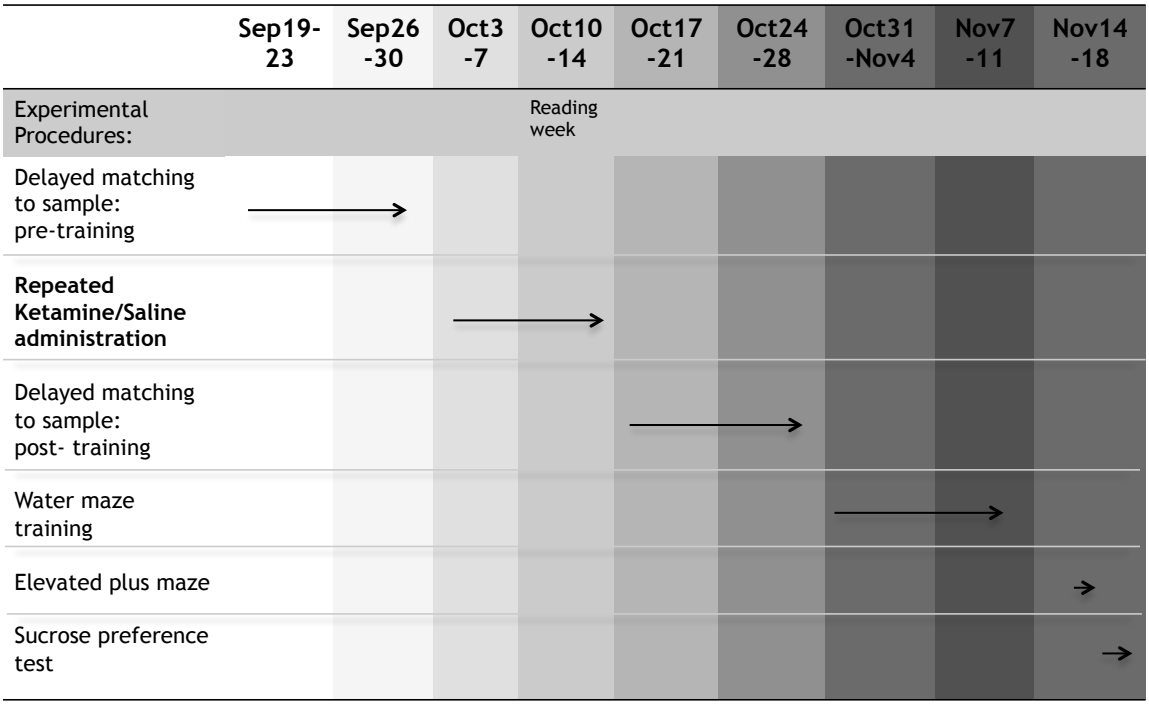
  → project has both pedagogical and research merits!

- you will be working closely with your group of 4 (Groups A-F) and will be assigned 4 Long Evans rats to work with

- rats will have ID numbers, but you will not know the treatment group that they will end up in

- rats will undergo 4 different behavioural tests:

- Delayed matching to sample task (operant task)
- Morris water maze
- Elevated plus maze
- Sucrose preference test



- Signing up for testing slots

Time for Testing	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday + Sunday
9 - 10am	Group A	Group A	Group A	Group A	Group A	Testing may sometimes needed to be done
10 - 11am	Group B	Group B	lecture	Group B	Group B	
11 - 12pm						
12 - 1pm			Group B			
1 - 2pm	Group C	Group C	Group C	Group C	Group C	
2 - 3pm	Group D	Group D	Group D	Group D	Group D	
3 - 4pm	Group E	Group E	Group E	Group E	Group E	
4 - 5pm	Group F	Group F	Group F	Group F	Group F	

- Your group must keep the testing hour as consistent as possible from day to day - please select your times carefully

- Weekend testing may sometimes be necessary for longer acquisition tasks such as the operant and water maze task

- typical testing day:

- 2 group members go to SW148/149 to set up equipment,
  start operating software and prepare behavioral task

- other members go to vivarium to get animals
  → use cage covers and NROC63 card to transport rats to SW148/149

- during testing, divide responsibilities to ensure smooth performance:
  e.g. 1 student operates computer, 1 student operates timer,
  1 student takes care of rat, 1 student writes down results
  → take selfie every day to show who is present and send it to me:
  nroc63rats@gmail.com

- after testing, 2 students clean apparatus and 2 students bring rats back to vivarium to weigh and feed them
  → use ethanol for cleaning, use weight sheet for feeding

Location of experiments

- Vivarium SW708

- rats' dedicated holding room
- sucrose preference tests will also occur here
- access via Elevator 3 for transport to and from behavioral testing rooms
  → vivarium fob required
- animals must be weighed and monitored daily while undergoing food restriction
- animals must be handled well before experiments begin
- please ensure that protective gear (lab coat, mask, gloves) are worn at all times

- Behavioural testing rooms

- SW148: operant boxes
- SW149: elevated plus maze, Morris water maze

Endpoint

- Brain extraction and dissection

- optional part of the course, and if there is a lack of interest, we will not do this part
- involves sacrificing animals with CO2 in the vivarium, and then extracting the brain, followed by a rapid dissection of the brain to isolate the left and right striatum

Last but not least…

- This is an experiential course!

  → enjoy the experience

  → but also be prepared to put in hard work for good data collection!

- If you are willing to help with additional duties, please let me know (laundry, keeping track of supplies)! **Volunteers are always welcome!**