

## **NRSN Neuroscience Training Course**

**UiT the Arctic University of Norway, 8-12 August 2016**

### *Translational animal models in neuroscience*

#### Summary

Many peoples in the world suffer from mental disorders, like anxiety, depression, addiction, obsessive compulsive behavior, dementia, or schizophrenia. The mental or behavioral patterns cause often suffering or a poor ability to function in ordinary life. The causes of mental disorders are often unclear, but the (dys)functioning of the brain is proven to play an important role.

With the benefit of having control over variables and possible confounding factors, animal studies can provide a more fundamental insight into underlying mechanisms of illnesses and treatments. Over the years, a huge diversity of animal models have been developed for the different mental disorders.

The aim of the course “*Translational animal models in neuroscience*” is to learn more about the wide range of animal models that exist for studying different aspects of mental disorders. What type of models are available and what do they study? How do you select the appropriate animal model for your research? And how do translational are animal models? During the course we will be introduced to models for e.g. anxiety, depression, addiction, motivation, schizophrenia and memory. We will learn more about ethograms, and standard as well as novel behavioral assays i.e. how to use open fields, elevated plus mazes, conditioned place preference and automated behavioral observations.

Furthermore, many scientists are unaware of endogenous biological rhythms such as circadian, ultradian, infradian, lunar or circannual cycles. Since these are present in all organisms and affect their physiology and behavior, we will give a basic introduction to chronobiology and combine this with some analytical exercises. Finally we will also learn about double dissociations and important control tests and tasks.

The course will give you in-depth knowledge and training in critical thinking through lectures, seminars and discussion of the background and principles of the animal models and behavioral tasks assessing specific brain functions / circuits. The pitfalls and caveats, analysis and interpretations of data will be discussed. If your field is human neuroscience, the course will give you solid background to better understand the animal literature. Furthermore, you will be trained to justify your choice of behavioral tasks for an animal model. A tour through two different animal facilities is also included in the course.

#### Organizers and lectures

The summer school is organized by the Department of Psychology at the UiT the Arctic University of Norway in Tromsø, with support from the Norwegian Research School in neuroscience (NRSN).

- **Special Guest Lecturer: Heidi Lesscher, Utrecht University, The Netherlands**
- **Special Guest Lecturer: Jocelien Olivier, University of Groningen, The Netherlands**
- **Special Guest lecturer: Gregers Wegener, Aarhus University, Denmark**
- Guest lecturer: Robert Biegler, Norwegian University of Science and Technology, Norway
- Guest lecturer: Robert Murison, University of Bergen, Norway

- Gerit Pfuhl, Institute of Psychology, UiT the Arctic University of Norway, Norway
- Eelke Snoeren, Institute of Psychology, UiT the Arctic University of Norway, Norway

### Learning objectives

- To learn what animal models are available for different mental disorders
- To learn to select the appropriate animal model for your research
- To understand what specific (classical and novel) behavioral tasks are measuring
- To be able to identify and discuss strengths, limitation, pitfalls, caveats of the different models and tasks
- To acquire a set of tools to set-up an experiment and perform behavioral research

### Learning activities

To maximize learning output we will check the level of the group by providing multiple choice questions. We want to know which animal models you use or will use in your project and which behavioral assays you are familiar with. Importantly there will be a strong emphasize on discussions and group work as well as student presentations. There will be a final essay (5 pages) as a home-exam. Lecturers will devote considerable time for interactions and discussions with the students.

The course will start with a general overview of model species within psychology and neuroscience as well as introducing the student to the behavioral assays categorized by the concept it measures. Having a firm knowledge of basic tasks the course dives into animal models for specific mental disorders, letting the students design hypothetical experiments to test the animals. In seminar-like hours the knowledge is further deepened with practical exercises and oral presentations afterwards.

The daily topics will start with historical background before recent articles / state-of-the-art aspects will be taught. Every lecture is accompanied by critical questions and hints mentioning the strength, limitations but also shortcomings and pitfalls of the animal model. Through open discussions you will be prepared for the afternoons' practical exercises in designing your own behavioral experiments, how to analyze it and crucially how to interpret it. Each day two animal models and their behavioral assays will be analyzed in depths. However, great emphasize is also put on studying the "whole" and not just parts. There will be time for discussing and presenting seminar papers.

### Student presentations

In order to facilitate social and scientific interactions from the start of the course, students will be asked to prepare brief (maximum five min) presentations of their current PhD project during the first day of the course. In addition, students will be organized in groups discussing and critically reflecting methods and models, and presenting papers.

### Target group

The summer school is open for PhD students in neuroscience. Members of NRSN will be given priority, but other participants are welcome to apply and will be accepted if there are still places available.

## Practicalities

**Arrival:** Sunday the 7<sup>th</sup> of August 2016

**Departure:** Friday the 12<sup>th</sup> of August 2016 around 3 pm

**Location:** UiT The Arctic University of Norway

**Credits:** 3 ECTS credits.

**Number of students:** maximum 30 students

**Course fee:** Participation is free for members of NRSN

**Travel arrangements:** Participants from outside Tromsø should book their own travel. *Please do not book until you have a confirmed place in the summer school.*

NRSN will reimburse the costs after the event for members of the research school. Participants who are not members of NRSN must cover their own expenses. The travel reimbursement is limited to 2000 NOK (round trip) including public transportation (not taxi or private car) to and from the airport.

**Accommodation:** Participants who are traveling to Tromsø are welcome to stay at Thon Hotel Tromsø, and you can book your room here through the course registration form. The organizers have already reserved rooms for the period 7-12th of August (5 nights). The hotel will charge the organizers directly for all participants who are members of the research school. Participants who are not members of NRSN must cover their own accommodation, and will be charged for the hotel costs upon departure. More info: John Vegard ([john.v.bjorklund@uit.no](mailto:john.v.bjorklund@uit.no))

**Meals:** Lunch will be served every day. In addition, the program offers 3 dinners/social events.

## Course overview

Day	Topic	Key lecturers
Sun 7 Aug	Arrival on your own	
Mon 8 Aug	Basic animal behavior	Pfuhl
	Project presentations	PhD Students
	<i>Lunch</i>	
	Basic animal behavior II	Murison
	Rodent lab excursion and exercises	
	<i>Social event</i>	
Tue 9 Aug	Animal model for PTSD	Biegler
	Animal models for anxiety and depression	Olivier
	<i>lunch</i>	
	Group work and exercises	Biegler, Olivier
	<i>Social event</i>	
Wed 10 Aug	Pharmacology of stress and depression	Wegener
	Animal models for motivation	Snoeren
	<i>lunch</i>	
	Arctic animal lab excursion	
	Group work and exercises	Snoeren, Pfuhl
Thu 11 Aug	Animal models for addiction	Lesscher
	Comparison rats and humans	Murison
	<i>lunch</i>	
	Exercises	Lesscher
	Group work	PhD students
	<i>Social event</i>	
Fri 12 Aug	Animal models for schizophrenia and autism	Pfuhl
	future of translational research	Wegener
	Group work presentations	PhD students
	<i>Round up and Departure</i>	