Bioimaging and Lab animal science: Importance of hygiene, anesthesia and stress

This course is meant to show why good animal housing and good health monitoring are important and why stress can have a negative influence on the results of your research.

Many experiments with animals assume that the animal is in a state comparable to a healthy animal under normal physiological conditions.

In order to achieve this assumption we want to show that it is of importance that your animal is not stressed – stress having an influence on physiology and anesthesia.

To know what causes stress and what are the effects on the animal is of great value to interpret your results.

The course is made of 4 lectures & discussion:

9h15-10h45 : Stress (Hanne Frenkel, DVM)
10h45-11h00 : coffee
11h00-12h30 : Running the Animal House and Laboratory Animal Health (Gisèle Ferrand, DVM)
12h30-14h00 : Lunch
14h00-15h30 : Microbiological Status and Hygiene (Maëlle Le Pottier, DVM)
15h30-17h15 : Anesthesia and Physiology (Hanne Frenkel, DVM)

**Stress:**
A large part of this course will be dedicated to the definition, recognition and interpretation of stress.
Recognizing stress requires some knowledge of the normal behavior of your subjects. Thus this course will look at normal behavior of rats and mice and how this behavior may differ in a stressed animal.

To avoid stressing your experimental subjects it is necessary to understand what can cause stress. We will take a look at possible reasons that can cause stress starting at birth via transport, housing, handling of the subjects and finally more hidden stressors such as bad induction during anesthesia, unphysiological body temperature and pain during surgery.

Lastly we will look at the effects that stress has on physiological parameters and how this will affect the interpretation of your results.

**Running the Animal House and Laboratory Animal Health:**
We will present briefly the infectious diseases of Lab Animal with a focus on the ones we are facing on a daily basis in our animal house of the Lemanic area.
We will then explain why and how to monitor the animal house. And finally, practically, how to protect the animal house from a contamination, as well as how to protect ourselves from getting a zoonosis and becoming allergic.

**Microbiological Status and Hygiene:**
In this session we will discuss the following topics:
- How to perform a rodent clinical examination and to detect abnormalities.
- What are the common pathologies we have to deal with in our facilities.
- We will explain some infectious diseases but also other troubles with a behavioral, environmental, genetical or experimental origin.
- What are the different health status of the animals and why is it important.
- From the axenic to the conventional status, explanation of the status, advantages and disadvantages of each one.
- Why is the health monitoring important in animal facilities
- Zoonosis and allergies

**Anesthesia and Physiology:**
The content of this course will include a reminder of the basics of anesthesia: the definition of anesthesia, induction, maintenance and important physiological parameters. It will discuss different anesthetics and why we chose to use different anesthetics for different procedures. Monitoring physiology and avoiding stress will be one of the principal parts of the course.

Stress can change the effects of anesthesia making it hard to maintain physiological parameters or even leading to premature death under anesthesia.

Furthermore we will talk about the challenges of long maintenance anesthesia studies and the simultaneous infusion of substances which may alter physiology thus affecting anesthesia.