LAS-Learning

Trainees Instructions

EU Module 3.1 - Basic and appropriate biology - Species specific: Mouse

Development of interactive e-learning modules on specific areas of the Education & Training framework facilitating implementation of DIR 2010/63/EU

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Suported by:

Partners:

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1. Module Description

1.1 Overview

This module - Basic and appropriate biology - Species specific: Mouse - offers essential background information on the species-specific behavior and biology of laboratory mice. It highlights the importance of aligning the animal's biology with proper husbandry and relevant research practices, which is crucial for conducting ethical, reproducible, and externally valid research using model organisms.

This module will cover four topics: Mice and rats are rodents, Rats and mice strains, Using rodent biology to inform research practice, and Mouse biology and behaviour.

If you are visiting the site independently, you should consult the EC Training and Education framework guidance document, which provides an overview of training requirements for individuals with different responsibilities under their relevant national legislation. Additional education and training may be necessary to meet national or institutional requirements.

This document offers suggestions for supporting your training. The module aligns with the learning outcomes specified by the EU Education & Training framework for laboratory animal science. This module was developed by Manuel Berdoy and Vootele Voikar, two renowned experts with extensive experience researching, publishing, and training in the behaviour and biology of rodents. In addition, an international Reflection Group panel has further refined the content, while Nuno H. Franco managed overall coordination.

Your collaboration and feedback are greatly appreciated, as the module is currently in the testing phase.

1.2 Topics Covered

- Mice and rats are rodents
- Rats and mice strains
- Using rodent biology to inform research practice
- Mouse biology and behaviour

1.3 Learning Objectives

- Understand the classification, characteristics, and biological significance of mice and rats as rodent species.
- Identify different strains of rats and mice and their relevance to biomedical research.
- Apply knowledge of rodent physiology and genetics to improve research design and animal welfare.
- Recognise key aspects of mouse biology and behavior to enhance experimental accuracy and animal care.

To support your ongoing learning, each module concludes with a curated list of recommended readings and cited references. Whenever possible, these references are linked to facilitate further exploration.

2. Prerequisites and Requirements

No specific prior knowledge is required. However, a basic understanding of searching bibliographic databases and a background in laboratory animal science and/or non-animal methods can be advantageous.

This module is designed to guide you step by step, eliminating the need for prior study.

2.1 Requirements

- Completion of lessons and understanding of learning objectives.
- Participation in knowledge checks and assessments to evaluate understanding.

3. Grading and Completion

Grading will be based on the successful completion of knowledge checks and assessments provided at the end of each module. Upon finishing all parts of the module, students will receive a certificate of completion. If proof of completion for a specific section is required, learners may be asked to take a screenshot of the screen, as each part's completion is indicated. This ensures transparency and verifiability of progress.

4. Textbooks and Reading Materials

The **"References and Further Reading"** lesson provides most references and readings. They comprise scientific articles, sections of books, websites, and videos. Clicking on any link will open a new window to download or visualise the additional material. Several links to further resources can also be found in the module contents to better guide the reader.

The additional materials provide more information on specific topics, tools, and resources.

5. Course Program

The module is organised into six chapters, with lessons and learning objectives as follows:

Chapter	Lesson	Learning objectives

Introduction : Rats and Mice	1	Get to know the learning objectives
Mice and rats are rodents	2-4	What are rodents? Rodents gnaw... Short life span - but why?
Rats and mice strains	5-7	Genetic Background matters Types of Strains The importance of nomenclature
Using rodent biology to inform research practice	8-15	Know your animal Being Active at Night Being a Prey Species Assessing Welfare: the score sheet Prioritising senses differently From a complex world to a simple cage Standardisation vs Reproducibility Rats vs Mice
Mouse Biology and Behaviour	16-24	Wild Mice and Laboratory Mice Handling Mice The Life of a Mouse in Numbers Sensory Biology Reproduction and Social Behaviour Mouse Nesting Feeding Recognition of Pain and Stress Anatomy and Physiology
Summary and knowledge check	25-27	Summary References and Further reading Mouse knowledge check

Table 1 - Learning objectives per parts and lessons.

5.1 Progress Tracking

Once you begin working through a module, your progress is tracked, and you can break off and resume your studies at any point. Once the module is completed, the trainee can access any section to refresh their understanding of a topic.

5.2 Module Structure

The module is divided into several parts, and although they were designed to be followed sequentially, they can also be taken iteratively. Please note that a certificate of completion is only issued to learners who complete all module parts. If proof of completion for a specific part of the module is required, the trainee should provide a snapshot of the screen because the module indicates progress after each part is completed.

5.3 In-Depth Explanation Lesson by Lesson

Lesson	Title	LO	Explanation
1	Introduction		Image and tagline.
2	What are rodents?	3.1.1	Rodent taxonomy and characteristics represented with 3 photos and 1 diagram.
3	Rodents gnaw...	3.1.1	Rodents gnaw are represented in 1 collapsible of 2 windows with 2 images, and 2 more images outside.
4	Short life span - but why?	3.1.1	Why do rats and mice have a short life span, represented with text.
5	Genetic Background matters	3.1.7 3.1.8	Genetic background represented with 1 diagram and 1 list.
6	Types of Strains	3.1.7 3.1.8	Types of strains represented in 1 line chart, 1 interactive labelled image, 1 collapsable and 1 bar chart.
7	The importance of nomenclature	3.1.7 3.1.8	Nomenclature description represented with 2 photos, 1 diagram and 1 collapsible with 2 windows.
8	Know your animal	3.1.3	"Happy Animals make good science" description represented with 1 collapsible.
9	Being Active at Night	3.1.1	Rodents' activity at night represented in 1 video and 1 tab with 2 windows with 2 line charts.
10	Being a Prey Species	3.1.2 3.1.3 3.1.4 3.1.6	Finding shelter represented with 4 photos and 1 video. How to handle rodents represented with 2 videos. Recognising pain represented with 3 photos and 1 collapsible.
11	Assessing Welfare: the score sheet	3.1.9	Score sheets description represented in 1 table and 4 matching quizzes. Score sheet example represented in a table.
12	Prioritising senses differently	3.1.1	Senses description with 1 video.
13	From a complex world to a simple cage	3.1.4 3.1.6	Environmental enrichment represented in 1 collapsible, a 4-window tab with 2 videos and 2 images.

			Life in cycles description with 1 interactive labelled image, 1 video and 4 photos.
14	Standardisation vs Reproducibility	3.1.3	Standardisation vs Reproducibility description with text.
15	Rats vs Mice	3.1.4	Differences between mice and rats represented with 1 photo and 6 videos.
16	Wild Mice and Laboratory Mice	3.1.1 3.1.7	Wild mice represented in a photo with description. Lab mice represented in a photo with description.
17	Handling mice	3.1.1 3.1.3	principles of handling demonstrated with 2 videos
18	The Life of a Mouse in Numbers	3.1.1	Relevant biological data represented in 2 tables.
19	Sensory Biology	3.1.1	Senses of the laboratory mouse description in 1 timeline.
20	Reproduction and social behaviour	3.1.1	Reproductive biology of mice description represented with 2 figures. Social behaviour and aggression description, and 1 exercise with 4 flip-cards.
21	Mouse nesting	3.1.6	The importance of nesting material, with 4 photos
22	Feeding	3.1.5	Description of nutrition with 4 photos.
23	Recognition of Pain and Stress	3.1.2	Stress, distress and suffering description with 1 list and 1 image.
24	Anatomy and Physiology	3.1.1	Skeleton, External Genitalia and Digestive system represented in 4 labeled figures. Exercise to distinguish male and female with 4 flip-cards.
25	Summary		Module summary
26	References and Further Reading		References for additional materials
27	Mouse Knowledge-check		Assesses progress and knowledge acquired about the mouse during the module

Table 2 - Explanation lesson by lesson.

6. Target Audience

This module is intended for (bio)medical researchers, participants in laboratory animal science courses, university students, biology/medical teachers, animal welfare body members, regulators, and anyone interested in learning more about animal

research ethics and the principles of Replacement, Reduction, and Refinement of animal use for scientific and educational purposes.

7. Notes

As this is a test run, we kindly request one feedback form for each tested module to ensure we gather thorough insights for every tested module. The majority of the modules are designed to complement other components of your training, and the content should be accessible even if you have relatively little experience working with laboratory animal science. Where appropriate, the introduction to the module suggests pre-reading and suggested training that should be completed before continuing with the module.

7.1 Tester's Feedback Form

We would greatly appreciate your valuable insights and detailed feedback regarding the instructions provided. Your input will help us ensure clarity, accuracy, and overall effectiveness in conveying the necessary information.

https://forms.uu.nl/universiteitutrecht/TestReview_LASLearning_instructions