Learning Modules

The aim of this document is to give residents a view of tasks and skills a resident should master to be able to pass the ECLAM Diplomate exam and to function as an expert in laboratory animal science within Europe. As an aid, the EU Training consensus document, describing the tasks and skill of a Designated Veterinarian (level 6) and the VETCEE document, describing the tasks and skills of a national expert (level 7) can help to prepare for the ECLAM Diplomate exam. ECLAM expects a Diplomate not only to know a vast amount of fact, but also to be able to conduct an analysis, create a synthesis and to evaluate, reason and argue for solutions.

Module 1: Provision of advice and veterinary services regarding transport, import and export of animals

Task 1: Advice/veterinary examinations in relation to transport, import, export or re-homing of animals and quarantine procedures

Task 2: Advise on the choice of animals (including genetically altered animals) regarding microbiological quality and health, with special emphasis on transported animals

- Implement 3Rs during transportation of animals, short and long distances
- Compare and discriminate between different transportation modes impact on animal welfare and scientific outcome
- Discuss genetic drift and its impact on different providers colony
- Assess different providers of animals with regard to quality and security of animals and transportation
- Understand characteristics of common strains of laboratory animals

- Assess microbiological status of animals and recommend strategy for import and export, including clinical examination, quarantine, legal requirements and international guidelines
- Advise on adaptation to a novel environment, how long that would take and how it can be facilitated
- Advise on re-use
- Advise on rehoming and discuss aspects to consider during the rehoming process
- Advise on capture and handling of wild animals, transportation and housing if needed, and discuss special considerations regarding sick/injured wild animals

Module 2: Provision of advice regarding animal husbandry, housing and care

Task 1: Advise on animal husbandry including genetics, breeding techniques, appropriate nutrition, and enrichment

Task 2: Discuss and advice on measures to provide daily control and good care

- Implement 3Rs in husbandry and housing
- Understand and explain breeding schemes based on genetics and expected scientific outcome
- Understand nomenclature of wild type and genetically altered animals
- Understand nutritional needs of common laboratory research species. Assess and compare different feed and feeding regimes and their impact on animal welfare and scientific models.
- Assess and recommend appropriate housing and enrichment for different animal species based on reasoned arguments.
- Advise on special housing conditions (isolators, metabolic cages, open cages vs IVC)
- Discuss hygienic principles of laboratory animal housing and maintenance
- Discuss animal and scientific impact of policies on "culture of care"
- Discuss and recommend different methods to provide effective daily control

○ Discuss different identification methods and their impact on animal welfare, be aware of the regulations/prescriptions regarding the compulsory identification of animals (e.g., agricultural species, dogs, cats and primates)

Module 3: Surveillance of health status; prevention, detection, treatment and control of disease (including zoonoses) and disaster planning in case of outbreaks

Task 1: Establish a programme of surveillance of animal health at a frequency adequate to monitor the health and welfare of the colony; include both scheduled testing and intercurrent cases

Task 2: Prevent, detect, treat and control diseases (including zoonoses)

Task 3: Attend veterinary clinical cases

Task 4: Advise on practices which could affect health and welfare

Task 5: Advise on disaster planning in case of outbreaks

- ○ Describe agents, signs and consequences of diseases, both on animal and research
- ○ Compare and discriminate among analytical methods used to detect agents or signs of disease
- ○ Be able to handle and restrain the most common species
- ○ Be able to take samples for the most common analyses
- ○ Be able to inject on the most common species, at least ip, and sc (and im and iv on larger animals)
- ○ Describe preventative actions and recommend methods based on reasoned arguments
- ○ Assess and recommend actions in case of infection, considering animal welfare and scientific outcome
- ○ Consider consequences for human health and in what cases animal health authorities need to be informed
- ○ Assess and recommend actions in case of non-infectious disease in common laboratory species

○ Discuss and recommend surveillance strategies for different environments and circumstances

Module 4: Advise researchers, person(s) responsible for the project and the AWB on study related matters of animal health and welfare, animal models, experimental design, implementation of the 3Rs and severity assessment of procedures

Task 1: Recognise and manage adverse events impacting the health or welfare of animals, whether associated with an experimental protocol or not.

Task 2: Advise on choice of species and strains (including genetically altered animals).

Task 3: Advise on animal models and experimental design, evaluation and statistics

Task 4: Advise on implementation of the 3Rs in relation to any aspect of the care or use of animals

Task 5: Advise on humane endpoints and euthanasia

- Discuss and summarise ethical judgments with regard to animal welfare vs scientific advance (balance of harm and benefit)
- Verify value of evidence when deciding on model development, implementation of 3Rs and experimental design
- Understand basic principles of scientific modeling in animals including different ways of model induction, common models in biomedical science and phenotyping
- Advise on common animal models, including production of genetically altered animals (e.g. humanised mice, diabetic rats, arthritis models).
- Assess experimental design, explain animal impact and impact of adverse effects on scientific outcome
- Discuss severity assessment and recommend strategies to diminish impact of procedures on animals
- Explain relevance of choice of species and strain to impact on scientific outcome

- Describe and compare biology of laboratory animals and its impact on scientific outcome, including translational possibilities and limitations
- Discuss strategies for selecting humane endpoints and appropriate euthanasia methods.
- Assess and recommend generally accepted non-animal alternatives to common animal experimental methods

Module 5: Recommendations for non-surgical and surgical interventions. Provision of advice and guidance for anaesthesia, analgesia, surgery, peri-operative care and alleviation of pain, suffering and distress in relation to experimental protocols

Task 1: Provision of technical advice for surgical and non-surgical interventions

Task 2: Provision of advice and guidelines for anaesthesia, analgesia, and peri-operative care in relation to experimental protocols

- Discuss ways and means to mitigate distress, e.g., adaptation to handling or training for procedures
- Discuss implementation of 3Rs in technical procedures, surgery and peri-operative care, including anaesthesia
- Advise on non-invasive imaging approaches and discuss its impact on severity and scientific validity
- Describe and recommend anaesthesia, analgesia and perioperative care in different situations and circumstances
- Understand pain physiology relevant for animals in experiment
- Explain mode of action of different analgesic and anaesthetic agents
- Recommend peri-operative procedures to maintain homeostasis or minimise adverse effects on the animal
- Describe and rank procedures and perioperative factors with impact on animal welfare and scientific outcome

Module 6: Assess the well-being of animals and assign severity classification

Task 1: Advise on routine assessment of well-being.

Task 2: Advice on welfare assessment in special circumstances, including cumulative severity, and substantial severity

Task 3: Advise and/or examine prior to reuse, re-homing, release to the wild, and the end of a procedure

Task 4: Manage pain and distress

- Discuss and describe methods and parameters used to assess animal welfare
- Recommend different methods of animal welfare assessment in different environments and circumstances based on reasoned arguments
- Describe the Five Freedoms for animal welfare
- Discuss values of different theories and impact of subjectivity with regard to interpretation of animal welfare and severity assessment
- Describe strategies to implement humane endpoints and proper severity assessments
- Advise on the fate of the animal, and the criteria regarding survival and subsequent uses or destinations. Demonstrate the veterinary role of clinical assessment and reviewing individual history

Module 7: Regulations, Ethics, Training, and Facility Design

Task 1: Regulatory responsibilities, legal requirements and international guidelines

- Explain and apply 2010/63/EU and guiding documents, ETS123 Appendix A, international guidelines on laboratory animal issues, with a particular focus on the activities of the Designated Veterinarian.
- Explain and discuss Balai, Good Laboratory Practice, AAALAC accreditation
- Discuss different approaches to assure proper documentation and record keeping of recommendations, instructions, investigations, actions taken, treatments and handling of drugs

Task 2: Veterinary input to training and competence assessment of scientific, animal care, and ancillary staff

- Discuss value of good communication and teaching/learning techniques
- Assess use of electronic tools and references
- Discuss importance of both theoretical and practical knowledge when handling animals.

Task 3: Laboratory animal ethics and project authorisation process

- Discuss and explain different views on use of animals, in general and in research
- Discuss and explain process of project authorisation and compare different approaches
- Discuss and give examples of recommended veterinary advice on these subjects

Task 4: Advise on construction and management of animal facilities. Explain strategies to separate clean from dirty in the daily work in different animal facilities. Discuss choice of materials for animal rooms, laboratories, stores and cleaning facilities.

- Discuss choice of construction materials, and their impact on hygiene and cleaning
- Discuss impact of chosen equipment on maintenance and refurbishment of animal facilities
- Compare and explain bio-containment and bio-exclusion
- Discuss health and safety issues within an animal facility
- Discuss different operational models and technical solutions at a laboratory animal facility (e.g. HVAC, environmental control, waste management, direction of flow of animals and goods)
- Discuss and suggest structure of disaster planning for animal facilities

Laboratory Animal Species

The list below indicates the grading of the most encountered species in laboratory animal facilities and the depth of knowledge in the modules above that an ECLAM Diplomate must possess.

Primary (deep knowledge required): 60-70% weight

Mice, rats, rabbits, macaques, dogs, swine

Secondary: (thorough knowledge required): 25-30% weight

Zebrafish, African clawed frogs, cats, guinea pigs, ferrets, squirrel monkeys, sheep, Syrian hamsters, baboons, marmosets, tamarins, gerbils, goats

Tertiary (general knowledge required): 5-10% weight

Chickens, pigeons

Other reptiles, rodents, nonhuman primates, livestock, fish, birds, amphibians and invertebrates