Learning outcomes for undergraduate education in research animal sciences

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- **British Pharmacological Society IVTG**
- **BPS/TPS Short courses**
- **UK RAS Curricula**
- **Current demand?**
- **IPF**

**RECOMMENDATION 1: DEVELOP CORE LEARNING OUTCOMES**

Educators and employers in the *in vivo* community should work together and lead the development of clear core learning objectives for the *in vivo* sciences, including experimental design, statistics, animal welfare, cultures of care, ethics and the 3Rs. These outcomes should be integrated across the biosciences, and should be reinforced throughout a student’s undergraduate and postgraduate career.

Ugrad research animal sciences Learning outcomes

Core learning outcomes

The curriculum for the use of research animals is intended to support undergraduate and taught masters degree programmes in which students are expected to analyse literature and/or data that have been generated from studies involving animals that are subject to regulation ("research animals"). For example, under the Animals (Scientific Procedures) Act 1986 - ASPA. The following experiential learning outcomes are intended to provide additional support for those who wish to go on to study research animals in their courses, placements, projects and careers.

Experiential learning outcomes

Knowledge

- Frameworks and principles
- How and when research animals are used
- The relevant legal and regulatory standards
- The ethical principles of the use of research animals
- The importance of research
- The animal welfare implications
- Their personal ethical and moral boundaries

Frameworks and principles

- Good practice in biosecurity to mitigate harms to humans, animals and the environment
- The importance of mentors and experienced personnel in education and training

Experimental design, analysis and communication

- The need for assessment of the welfare of research animals including pre and post-operative care and the use of anaesthetics and analgesics
- Appropriate formulations and routes of administration of compounds used in experiments
- Recovery and non-recovery surgical techniques applicable to animal research
- How pharmacological agents (e.g. anaesthetic) or environmental conditions (e.g. subclinical infections) can affect experimental outcomes

Skills

In addition to the skills statements in the core curriculum, students will be able to:

- Set appropriate exclusion and termination criteria with regard to welfare limits and the quality of experimental data
- Appropriate handle at least one species of research animal
- Gain experiential learning through direct involvement in at least one of the following:
  - Ex vivo (in situ semi-intact) e.g. working heart brainstem
  - Terminally anaesthetised research animals
  - Conscious research animals e.g. behavioural or pharmacological study
  - Surgical techniques eg cadavers, use of reputable/realistic simulation

Relevant disciplines

Aspirational

Experiential learning
Sector-wide endorsement

- abpi
- AstraZeneca
- BAP
- BNA
- BTS
- Charles River
- GSK
- NC3Rs
- National Centre for the Replacement, Refinement & Reduction of Animals in Research
- The Physiological Society
- Royal Society of Biology
- LASA
- Microbiology Society
- South African Association for Laboratory Animal Science
- SEB
- Understanding Animal Research
- Barts and The London School of Medicine and Dentistry
- University of Bristol
- University of Glasgow
- University of Hertfordshire
- University of Leeds
- University of Liverpool
- Manchester 1824
- University of Strathclyde
- UCL
- KCL
- RVC
Going forward

- BPS/Physiological Society Implementation Task & Finish Group
- Sector-wide collaboration
- Educational resources
- Funding
  - Resource development
  - Expert Educator Ambassadors
  - Educator professional development
- Evaluating success?

www.etris.leeds.ac.uk
Your views & thoughts!

• Do you see a need for these learning outcomes ([https://www.bps.ac.uk/education-engagement/research-animals/curriculum-for-the-use-of-research-animals](https://www.bps.ac.uk/education-engagement/research-animals/curriculum-for-the-use-of-research-animals)) at your Institution and/or across the sector?

• What challenges do you see with its implementation at your Institution and/or across the sector. Should we focus on specific aspects?

• How could we best address these challenges- what support do you think educators need?

• Do you have any suggestions for help you, your Institution, or the sector could provide to facilitate implementation?

• How can we evaluate success? What does success look like?