



BRITISH
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TODAY'S
SCIENCE
TOMORROW'S
MEDICINES

Learning outcomes for undergraduate education in research animal sciences

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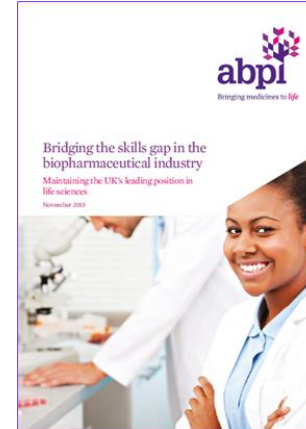
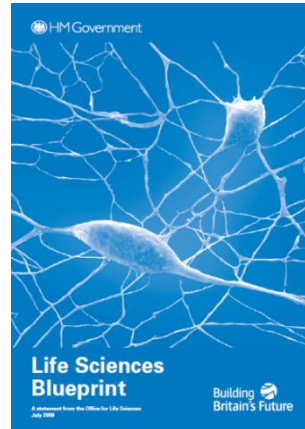
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UGrad research animal sciences education



- 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 - A(SP)A. 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.

- Knowledge
 - Frameworks and principles
 - How and when research animals are used
 - Experimental design, analysis and communication
 - Fundamental science
- Skills
- Attitudes

Knowledge

Students will acquire an appreciation of:

Frameworks and principles

- The relevant legal and regulatory standards
- The legal and moral obligations and responsibilities
- The ethical principles of the use of research animals
- The lifetime experience of research animals
- The principles of Culture of Care
- The existence of recognised methods of research
- Societal attitudes to animal research
- How animal welfare considerations are taken into account
- Their personal ethical and moral beliefs

How and when research animals are used

- Why research animals are used, including the principle of the 3Rs
- The principle that research animals should be used to answer a specific scientific question
- The rationale for the use of different species of research animals
- How research animals are used to understand human health and disease
- How research animals are used in the development of new drugs and medical devices

Experiential 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 - A(SP)A. 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.

- Frameworks and principles
- Experimental design, analysis and communication
- Skills

In addition to the knowledge statements in the core curriculum, students will acquire an appreciation of:

Frameworks and principles

- Good practice in biosecurity to mitigate harms to humans, animals and the environment
- The important role 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 (eg anaesthetic) or environmental conditions (eg 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
- Appropriately 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) eg working heart brainstem
 - Terminally anaesthetised research animals
 - Conscious research animals eg behavioural or pharmacological study
 - Surgical techniques eg cadavers, use of reputable/realistic simulation

- Relevant disciplines
- Aspirational
- Experiential learning



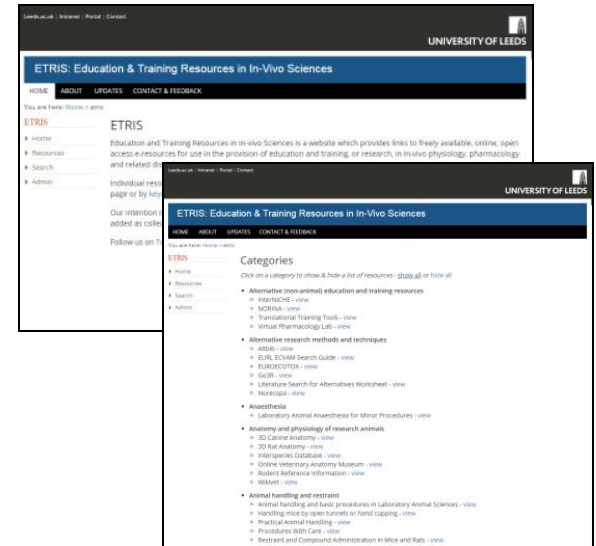
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Sector-wide endorsement



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?



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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>) 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?