

## The use of animals in research and experimental design

BBSRC supports the continued use of animals in research, where strict conditions are met. These conditions and expectations are clearly laid out in the Grants Guide ([LINK to Grants Guide](#)). The most recent update of the Grants Guide has been developed to clearly assist applicants in giving due consideration to:

- the justification of using animals within their research
- application of [the 3Rs](#)
- ensuring appropriate experimental design and statistical analysis from the earliest stage of the grant writing process

It is highly recommended that researchers applying for BBSRC funding and considering the use of animals in their research, carefully review this guidance and incorporate full details of any experimental use of animals within their proposals.

### Experimental Design Assistant (EDA)

When considering the experimental design of their projects, applicants are directed to utilise the [Experimental Design Assistant \(EDA\)](#), a free access tool from the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs).

The EDA was developed to address problems with the quality of animal research. Unfortunately, there is a large body of evidence, to show that many animal studies are flawed and that this has significant implications in terms of the reproducibility of findings [1-3]. The EDA is an online resource to help researchers improve the design and analysis of animal experiments. It complements the [ARRIVE guidelines](#) for reporting animal research and was developed in collaboration with an expert working group of *in vivo* scientists and statisticians from academia and industry, and a [team of software designers](#) specialised in innovative software for the life sciences.

The resource will be useful to scientists who use animals in their research. The EDA uses computer-based logical reasoning to provide tailored advice and feedback on the experimental plans. It also includes a range of functionalities providing support with the randomisation and blinding of the experiment, as well as sample size calculation. The EDA provides researchers with practical information and knowledge, allowing them to determine the most efficient design for their experiment and understand the implications of choosing a particular design or analysis.

A central feature of the EDA is the use of a formal, diagrammatic notation to describe experimental plans and analyses. This is an approach that has been adopted by many technical disciplines to improve communications. It allows the design of an experiment to be recorded clearly and unambiguously and EDA diagrams help convey experimental plans efficiently. The explicit description facilitates an assessment of the experimental plans, which can be at the level of a grant application, but also the ethical review, manuscript submission or published paper. The diagrams also help to review the designs with lab members and collaborators, before data are collected.

1. Freedman, L.P., I.M. Cockburn, and T.S. Simcoe, *The economics of reproducibility in preclinical research*. PLoS Biol, 2015. **13**(6): p. e1002165.

2. Begley, C.G. and J.P. Ioannidis, *Reproducibility in science: improving the standard for basic and preclinical research*. *Circ Res*, 2015. **116**(1): p. 116-26.
3. Kilkenny, C., et al., *Survey of the quality of experimental design, statistical analysis and reporting of research using animals*. *PLoS One*, 2009. **4**(11): p. e7824.