Biomedical 3R's Examples

- This document will assist with answering the 3R's question (Replacement, Reduction & Refinement) in the Biomedical Animal Ethics Application Form.

Topic	What the Applicant Says	What the AEC Might Prefer to See
Ethical aspects of work	There is no alternative to using animals	Wrong answer and this could never be the right answer to this question. What is needed is a consideration of the work from the animals' perspective. Simple questions such as, will they feel unwell or stressed and if so what can be done to minimise/ prevent these effects? What is the greatest potential negative effect your work will have on the animals and what are the potential benefits – how do these correlate with each other (balancingthe equation).
Replacement	There is no alternative to using animals	This may well be true, but would be more credible if backed up with some consideration of possible alternatives and why they are not appropriate and / or some indication of on-line literature search criteria (e.g. PubMed search using keywords ……. Or Google search using keywords …….., etc.) A lot of researchers have done *in vitro* work leading up to their proposed animal studies, but fail to mention them, which is a great pity as it would be a significant benefit here.
Reduction	We will use groups of n = x because we have always used this many and it has worked really well.	Historic precedent may be an indicator (albeit often a poor one), but expectations for animal number justification are important and really should be accompanied by some kind of statistical justification (e.g. power calculation or similar) as well as an indication of what kind of statistical analyses will be used to confirm validity of the data obtained.
	We will use groups of n = x animals because this is commonly reported in the literature	Again, reference to previously published work can be a good indicator, but some appropriate statistical justification is warranted. It is also important to remember that one power calculation (if that is your method of choice) is usually not applicable across a range of different experimental techniques. So each separate step of a multi-stage project will generally require its own justification of group size etc.
		Has a pilot study been considered to confirm experimental viability and / or parameters? This may require a few extra animals at the outset, but can also significantly reduce wastage and overall animal use.
		Once again, if some in vitro work has been done leading up to the animal study, it should be mentioned as it would have reduced the total number of animals that might otherwise have been required.

Biomedical 3R's Examples

Refinement	We have been doing this for 20 years so we are the ex-perts…….	If you are still doing it exactly the same way, why? A lot has changed in the last 20 years, so can you use newer / better anaesthetics, analgesics, or whatever may be appropriate? Have you kept up to date with literature and either moved with the times or preferably, be leading the pack when it comes to the techniques you use?
	Animals will be housed in the usual way	How are the social needs of the animals being met? How is this balanced against possible need to separate fighting co- horts? What sort of enrichment is being provided? Are you providing soaked feed to animals during periods of potential morbidity? Are you providing any 'treats' like sunflower seeds for mice as an example? For rats and mice, what kind of caging are you using – for example, are you using high top cages that allow rodents to stretch up, climb and see across to other cages etc.?
	Animals will be monitored weekly	The world can change a lot in a week and an animal can go from being perfectly healthy to dead and decomposed in this timeframe. So, the general expectation would be that ani- mals are checked at least once each and every day. Obvi- ously in cases where there is a possibility of the approved protocol resulting in morbidity, this would need to be ad- dressed appropriately in the monitoring regimen. So it is important to make it clear who will be monitoring the ani- mals, how often and what changes will trigger intervention of some kind or humane killing of the animal.