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The 3Rs - Is it a question of perspective?

Geoff Dandie, CEO, ANZCCART

When it comes to the scientific use of animals, AEC members place a great deal of emphasis on ensuring full implementation of the 3Rs – Replacement, Reduction and Refinement, as initially described by Russell & Birch in 1959. The importance of the 3Rs is emphasised by the fact they underpin all relevant legislation across Australia and New Zealand as well as *the Australian Code for the Care and Use of Animals for Scientific Purposes (8th Edition, 2013)* (the Code) and so the 3Rs are central to the deliberations of every AEC, while they consider every application to use animals for a scientific purpose. So it should not be surprising that most, if not all applications for the use of animals in any scientific procedure, require applicants to specifically address each of the 3Rs separately and in the context of the proposed work.

As a result of this focus on the 3Rs in the Code and AEC processes, it is always included in the material covered by animal ethics training programmes, particularly those

designed to introduce everyone working with animals to the Code and legislation. Such an emphasis can, of course, mean that AEC members may hold very high expectations and assume that researchers share their reverence for the 3Rs and their implementation.

It is therefore often a source of some frustration to many AEC members (myself included) that the questions on AEC application forms that directly relate to the 3Rs, are not always addressed with the same degree of enthusiasm and precision as other sections that describe the scientific aspects of the proposed work for example. Curiously, it may even reach the point where these sections appear to be among the most poorly addressed by applicants. I say "curiously" because other sections often require far more complex and detailed descriptions of work to be considered by the AEC, without being able to use the technical terms that are generally second nature to applicants and are

handled with ease. So the question may be asked, are the issues we all see occasionally, with applicants struggling to address questions that most AEC members regard as instinctive, indicative of a lack of knowledge or interest in the 3Rs, or merely a question of variance in priorities? Could it be that these questions really are far more challenging for applicants than we AEC members allow? Does this apparent difficulty reflect a lack of familiarity with the 3Rs, or is it simply a failure to acknowledge what scientists themselves routinely do to reduce their reliance on animals or to support the animals they use? Could it be an inability to consider the consequences of their work from the perspective of the animals they use? These are all questions worthy of consideration around the AEC before we sit in judgement and certainly ones that should be considered when planning any training session for applicants.

So, is what we are seeing a lack of knowledge about the 3Rs? Could it be indicative of an inability of scientists to show true empathy for the animals they use? There are probably plenty of sceptics around who might suggest that this would be the case, but personally I do not subscribe to this theory. Scientists are human and the fact that their work is almost inevitably aiming to make life better for humans and / or animals generally says a lot about their personal values, so if anything, perhaps the only negative assertion that may be valid would be that they do not feel comfortable trying to empathise with their animals. Another important consideration here is the inherent need every researcher has to ensure that the welfare of their animals is of as high a standard as is humanly possible, simply because they know that this is what is required for them to obtain the best data they possibly can from their work. Scientists are trained to understand that problems such as uncontrolled pain or distress will have a much broader impact on their animals than planned or approved as pain and distress can affect physiological parameters associated with the nervous, immune, haematological and/or endocrine systems in ways that would compromise their data.

Hopefully a lack of knowledge about the 3Rs is not the explanation because if it is, it indicates a failure of training offered to researchers by their institutions. Noting the requirement clearly stipulated in the Code (see section 2.1.2(v), 2.1.8(i) & 2.1.8(ii)), it is hopefully safe to assume that every researcher or teacher applying to an AEC would at least be aware of the 3Rs and what they mean to anyone wishing to use animals in the work. Should this assumption be incorrect, then any AEC that is

concerned about the standard of responses they receive to the 3Rs questions has a simple solution to the problem – implement or at least ensure the institution implements some appropriate training programmes to address this deficit.

Having participated in four AEC meetings across a couple of States during the past fortnight, it would seem clear that these issues are being faced by multiple AECs at the moment and while each seems to be addressing their own specific issues in their own way, there should actually be quite a bit of common ground and hopefully some value in sharing ideas about how to address them. Perhaps by looking at a few suitably anonymous examples, we can consider a few possible options and alternative wordings that might assist both applicants and AEC members alike.

Since the 8th Edition of the Code was released, there seems to have been a major push towards insisting that applicants employ power calculations or other similar statistical calculations to justify the number of animals they are requesting and applicants have largely taken this on board and are including this kind of information, which is good. However, there is still a common frustration associated with the number of applications that involve multiple experiments or multi-stage experiments with only one 'example' power calculation given. I will confess that I am no statistician, far from it in fact, but even I can see that it would be highly unlikely that different experiments, using different reagents or test compounds, over different time courses, would have the exact same biological variation (or standard deviation if you prefer) associated with them. So it would seem reasonable to assume that a separate calculation might be required to justify the number of animals (n) in each part of the study and of course, many applicants do provide these calculations, but unfortunately a lot do not. Equally, many applicants perhaps assume too much knowledge among AEC members when it comes to describing measures that are standard practice at their institution to aid the wellbeing of their animals – Refinement if you like. It is important that applicants give themselves credit for the measures they may consider 'routine husbandry' so that all members of the AEC are aware of what is in place. It is also an important part of the scientific method as something as simple as the provision of soaked grain can significantly assist with the maintenance of hydration and that can impact profoundly on a number of physiological parameters.

In the hope of keeping this as simple as possible, we might consider the laboratory animal setting and the world of wildlife separately. Considering these two broad areas in alphabetical order, we will think about laboratory animals first.

Topic	What the applicant says	What the AEC might prefer to see
Ethical aspects of work	There is no alternative to using animals	<p>Wrong answer and this could never be the right answer to this question.</p> <p>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?</p> <p>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 (balancing the equation).</p>
Replacement	There is no alternative to using animals	<p>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.)</p> <p>A lot of researchers have done <i>in vitro</i> 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.</p>
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	<p>Again, reference to previously published work can be a good indicator, but some appropriate statistical justification is warranted.</p> <p>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.</p>
		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.

Topic	What the applicant says	What the AEC might prefer to see
Reduction (continued)		Once again, if some <i>in vitro</i> 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.
Refinement	We have been doing this for 20 years so we are the experts.....	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 cohorts? 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 animals are checked at least once each and every day. Obviously in cases where there is a possibility of the approved protocol resulting in morbidity, this would need to be addressed appropriately in the monitoring regimen. So it is important to make it clear who will be monitoring the animals, how often and what changes will trigger intervention of some kind or humane killing of the animal.

Considering the same issues from the perspective of a wildlife researcher, there will obviously be much similarity with the issues above where they may be appropriate, but there will also be plenty of issues that arise which are unique to the life of wildlife research and these are the focus of the discussion on the next page.

Not surprisingly, applications that require trapping fish or terrestrial animals are often the ones that raise the most questions.

Topic	What the applicant says	What the AEC might prefer to see
Ethical aspects of work	There is no alternative to using animals	<p>As above, Wrong answer and could never be the right answer to this question.</p> <p>This should actually be a pretty easy question to answer in this context, because so much of the wildlife research done is aimed at helping to conserve the species or their habitat. So making sure the impact of your work is minimised makes ethical justification simpler. However, it is essential that you consider the potential impacts of methods you will be using from the animal's perspective. Whether it is the stress of confinement or restriction of feeding opportunity, describe them from the animal's perspective and consider how you will minimise the effects.</p>
Replacement	There is no alternative to using animals	<p>This is probably true but think about how you are using those animals. Do you really need to trap / capture / restrain the animals or can your aims be achieved by observation?</p> <p>Can you use camera traps, collect scats, use fur / hair / feather sampling traps as an alternative to capturing animals?</p>
Reduction	We don't know how many we will catch	<p>OK, this is an honest answer but not really one that aligns well with the operating practices of many / most AECs. Is there some 'middle ground' position that works for both the AEC and the applicant? For example, is there a target number of animals that might or are anticipated to be used? Whatever measure might be agreeable (even a ludicrous guess), the critical aspect here is to ensure that annual reports have accurate numbers listed so the AEC knows what is going on and the researchers can get some reasonable idea of animal species and numbers in the area for future applications.</p>
	These are only by-catch so we don't know what we might catch or how many.	<p>Again, an honest answer but the dismissive attitude does not leave a great impression about your compassion for animals. I think most people would concede that by-catch is by its very nature, more difficult to predict. So irrespective of whether the animals concerned are fish or native terrestrial animals again, either a predictive list of potential animals and possible numbers or an undertaking to accurately report by-catch in the annual reports would be preferable.</p>
	These are an endangered species, so the more we catch, the better.	<p>While the AEC would share your excitement about greater than expected numbers of endangered animals being caught, it is the kind of scenario that makes them nervous in case anything goes wrong and the animals are put at risk. Is it possible to work with a related (and not endangered) species or to use camera traps / fur traps or other non-capture techniques?</p>
	We are unsure of total numbers as we need to trap at particular times of the year.	<p>AEC members are generally very receptive to the need to undertake seasonal trapping work when it is explained well. However, they may still get nervous about the idea of issuing a 'blank cheque' approval. Can you indicate a desirable number of animals to trap each trip / season to get statistically valid data? Or could there be a compromise like agreeing to trap over the course of a week (or appropriate timeframe), or until x animals are caught in each area?</p>

Topic	What the applicant says	What the AEC might prefer to use
Refinement	We have been doing this for 20 years so we are the experts...	Again, a lot has changed during that timeframe. Are you still using the same equipment in the same way or have you adapted techniques over the years? If not, why not?
	Traps will be closed when not in use.	How will you be ensuring all permanent or semi-permanent traps like pit fall traps are secured between trapping trips? Will they be checked at regular intervals to make sure they have not been interfered with by either animals or humans in a way that might leave them open again without being checked properly.
	Traps will be checked regularly	This is good, but more information would be better. For example, when and how often will they be checked? How many traps will need to be checked and how many people will be doing the job, leading to a genuine indication of how long the process will take?
	Nets will be checked regularly	As both birds and bats can get tangled in mist nets and alike very quickly and risk injury, most AEC members prefer to hear that nets will be monitored constantly and get some indication of how long it will take researchers to get from the observation point to the net. It is also good to know how many staff will be on site relative to the number of nets deployed. Similar issues may be faced by those using nets in aquatic environments.
	Trapping will be suspended during adverse weather conditions	Excellent, but please define 'adverse weather conditions' more specifically. For example, what maximum / minimum temperatures would trigger suspension of activities? Are traps set under shade (either natural or artificial that might protect from frost or direct sunlight / heat? Would forecast rain / heavy rain be a trigger for suspension? Do you have some kind of floatation device in pitfall traps that might prevent drowning of trapped animals?
	Animals will be released at the site where captured.	This is excellent, but will they be released immediately or will they be held for any period of time? Will they be released in a time appropriate manner – ie. Will nocturnal animals be released before daylight or held and then released after dark?
	Animals will be marked for long – term identification	How will this be done? Care must be taken to ensure that normal camouflage is not compromised as this can impact on predation / survival. Techniques such as toe clipping always raise a bit of concern and need special justification. Noting of course that such techniques are not appropriate / acceptable with arboreal species for example. Can natural markings be used to identify individuals? Can they have electronic chips safely implanted? What other options might be possible and why or why not use them?

Changes in the ANZCCART AEC Member of the Year Award

Geoff Dandie, CEO, ANZCCART

In preparing this article, and drawing on both an earlier career in medical research and many years of experience as a member of a number of AECs and sitting in on many other AEC meetings in various States & Territories, it has been apparent that differences in State legislation, institutional policies or even the vast differences in individuals who sit on AECs across the Country, make very little difference to the kind of issues that arise. At least some of the comments and issues raised above may seem familiar to most AEC members. Equally, while the examples cited above are a long way short of being comprehensive, hopefully there are one or two examples that strike a chord with researchers who have been frustrated by questions and concerns raised by their AEC. Hopefully though, both AEC members and AEC applicants might be able to see that the greatest underlying problem in each and every case cited above, is simply a failure to communicate exactly what is proposed and why. So while we would encourage both AEC members and applicants to try to consider the other's perspective during the processes of deliberation, it is probably fair to say that the onus to explain what is going to happen does rest with the applicants. However, there is also a responsibility on AEC's to clearly communicate what their level of expectation is, under each R, to scientists and why the information is required. Such measures help to break down any perceived barriers between applicants and the AEC, so each party can view the relationship as a partnership.

On behalf of all AEC members, may I encourage all scientists to take sections on the application like these as seriously as those that describe the scientific aspects of your work and to give yourselves full credit for the 3Rs steps that you probably consider routine. That way you will portray your work to the AEC in the most positive way and give yourself the best chance of gaining approval without getting interrogated about why you are not doing things that you are already doing.

So returning to the original question posed, I suspect many differences in interpreting the 3Rs questions on AEC applications forms are not so much a question of perception or differences in perspective as they are simply a case of not fully communicating steps or precautionary measures that are already in place.

Russell, W.M.S and Burch, R.L. (1959) *The Principles of Humane Experimental Technique*. Methuen & Co. Ltd. London.

Since its inception in 2009, ANZCCART has sought nominations from across Australia and New Zealand that have allowed us to recognise the exceptional service provided to one, or more Animal Ethics Committees each year. Since that time, we have been astounded by the work done by members of AECs across the region – particularly by volunteer members, who frequently receive no remuneration for the huge number of hours they devote ensuring the wellbeing of animals used in research and teaching. Even where they are financially compensated for the work they do, it is at a rate that would ensure no one ever took on the role for the money. So in late 2008, the ANZCCART Board of Directors agreed to pay homage to the work of AEC members in Australia and New Zealand by setting up this award and using it to sponsor the attendance of the winner at the annual ANZCCART Conference each year.

During the eight years of this award, we have received over 100 nominations and on more than one occasion, it has been a genuine struggle to assess, sort and reassess those nominations until we could come up with a single recipient. In fact, in 2014, the task proved to be impossible and so two awards were made that year. One from Australia and one from New Zealand.

This started a thought process that culminated at the first Board meeting this year, when the decision was made to not so much split the award but to double it. So, from this year on, our plan is to recognise two exceptional AEC members each year, one in Australia and one in New Zealand. Each award recipient will be decided by the ANZCCART Board of each country, so the Australian Board of ANZCCART will decide who receives the award in Australia each year and the New Zealand Board will decide on the New Zealand recipient. Accordingly, nominations should now be sent to the appropriate office so they can be judged in accordance with the guidelines that were set out back in 2009.

For those who have already submitted nominations for this year, please rest assured that these have been shared between the Australian office in Adelaide and the New Zealand Office in Wellington and we look forward to seeing the outcome announced at this year's conference in Queenstown later in the year. If anyone is still interested in nominating an exceptional

member of their AEC, the closing dates for this year's award are as follows:

In Australia: nominations to ANZCCART@adelaide.edu.au close on 7 July 2017.

In New Zealand: nominations to anzccart@royalsociety.org.nz close on 31 July 2017.

We look forward to continuing this award in its expanded form and to being able to recognise the excellent work done by AEC members on both sides of the Tasman.

ANZCCART Conference 2017:

Maintaining Social License in a Changing World

The New Zealand Committee of the Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART) has great pleasure in announcing the 2017 ANZCCART conference will be held in Queenstown, New Zealand, and run from 3.30pm Saturday 2 September to Monday evening 4 September, as part of [Queenstown Research Week](#).

The theme of this year's conference will be "Maintaining Social License in a Changing World" reflecting our view that the responsible use of animals in research and teaching is a socially positive activity, which ought to be defended freely.

The draft Conference programme is available [here](#) and includes an exciting line-up of speakers covering a wide range of topics from social license in different contexts, to advances in replacement, reduction and refinement technologies, lessons from animal ethics committee front lines, and animal handling. The winners of the AEC Member of the Year Award, Animal Care Technician Award, and the student essay competition will also be announced.

The full registration rate closes on 20 August and registrations can be made either at: <https://dynamics.eventsair.com/anzccart-2017/registration>, or on the ANZCCART New Zealand website: <http://anzccart.org.nz/conferencesawards/>

For further information, see the [Conference Flyer](#), or contact: anzccart@royalsociety.org.nz

Recent Articles of Interest

Results of mouse studies substantially affected by the way the animals are handled

Traditionally, mice are picked up from the cage by holding the base of the tail, a method which is recognised as causing stress and anxiety to the animal. As mice are the most common animal used in research, minimising the stress is not only important to the well-being of the animal but it also has scientific importance

Researchers from the University of Liverpool have tested mice using both the traditional method of grasping by the tail and also by placing the mouse in a tunnel. Over three sessions, the mice were placed near a desirable stimulus and those picked up by the tail showed little inclination to explore the area and investigate the stimulus whereas the mice handled by the tunnel explored the area and the stimulus willingly over consecutive sessions. The mice were tested further using different scents with the same results.

In earlier research on alternative methods of handling, the researchers have shown that mice who were guided and then transported through an open tunnel are more familiar and interact better with the tunnel at a later stage and also with the handler. The mice who were picked up by the tail were more cautious and unwilling to approach both the tunnel and handler.

Stress can have a major influence on the reliability of responses in a wide range of tests as well as affect the welfare of millions of mice used in research around the world. These studies have shown that by simply using better handling techniques prior to and during testing, stress can be alleviated in some animals.

<https://www.nc3rs.org.uk/news/results-mouse-studies-deeply-affected-way-animals-are-handled>

Pain Assessment in Ruminants Made Easy

The passive nature of ruminants, such as sheep, cows and goats, has often made pain assessment difficult. Some of the behaviours displayed include teeth grinding, postural changes, and restlessness, however their reactions in non-traditional housing used in biomedical research could also affect this assessment.

A draft pain scoring system was designed by three

researchers in Pennsylvania and tested when monitoring of seven female Dorset lambs by Veterinary staff following surgery. The scoring system measured typical behaviours, such as teeth grinding and restlessness and was combined with heart and respiratory rates. Each category was scored from 0-3, with 3 as the highest pain / stress indicator recorded. As each animal may respond differently, an important part in the monitoring was to observe the sheep when being handled prior to surgery and their reactions were taken into account when using the scoring system after surgery.

Effective management of pain and distress is an essential part of ensuring that the well-being of laboratory animals is maximised and this new pain assessment tool helps to assess pain with more consistent research results. Read more at:

https://www.alnmag.com/article/2016/12/pain-assessment-ruminants-made-easy?et_cid=5719788&et_rid=454969632&type=cta&et_cid=5719788&et_rid=454969632&linkid=https%3a%2f%2fwww.alnmag.com%2farticle%2f2016%2f12%2fpain-assessment-ruminants-made-easy%3fet_cid%3d5719788%26et_rid%3d%26subscriberid%26type%3dcta

The mischief of mice.

The world's favourite lab animal has been found wanting, but there are new twists in the mouse's tale

Mice and rats are the main vertebrates used in research, however, more than 80% of the drugs that have worked in mice, and then tested in clinical trials are not successful in humans. Regardless of the hard work and commitment of the suppliers of laboratory animals, it seems that mice responses to various agents may vary significantly between different strains or sub-strains of mice.

Lab mice are from particular strains and are purposely inbred, over generations, until the whole bloodline is genetically very similar. However, just because they left the suppliers identical doesn't mean they will produce the same results. The way the mice are handled and fed and by whom, or if they are from the same litter or raised apart can significantly affect results.

A new concept in mouse-breeding has been developed world-wide by a community of researchers. To cover the genetic range already known in mice, researchers used five typical laboratory breeds and three wild breeds of mice and began to produce hundreds of new inbred strains. By controlling the inbreeding and tracing the new genetic combinations, researchers have developed new mouse models, both similar and dissimilar.

Working with a range of mice enables researchers to understand more about how genes interact through exposing the important genetic elements. This new method can mean more experiments with more complex statistics, however, if the research is harder, then the results may be more consistent and more worthwhile. See the article at:

<http://www.economist.com/news/christmas-specials/21712058-evolution-scientific-mainstay-worlds-favourite-lab-animal-has-been-found>

Animal models: Unlock your inner salamander

Some animals can regrow body parts with ease. Biologists hope to work out their secrets and apply them to humans, which is why Elly Tanaka, a regenerative biologist at the Research Institute of Molecular Pathology in Vienna has been studying salamanders (axolotls) for 20 years. The Salamander will regrow a lost limb, a perfect duplicate, within a few weeks and without any scar tissue and Tanaka is using this capability as a "guiding principle of how regeneration can work".

Research on heart regeneration has also been undertaken on animals such as zebrafish and mice, and studies have shown that when the heart of a one-day-old mouse had been damaged, the heart repaired itself without scarring. One week later the ability to repair the damage had gone and researchers wonder if that capability just "gets turned off during development".

Scientists have started to classify and control the genes and proteins stimulated during regeneration and as Tanaka says "We've identified enough molecules that we can kind of make a basic mechanistic description of what's happening in the salamander during regeneration". The next stage is to insert these genes into laboratory animals and researchers believe that when this happens it may then be easier translating it to humans. The capability of a human re-growing an amputated arm is still a dream for the future but researchers say this important first step could happen within the next few years. Read the full article here:

http://www.nature.com/nature/journal/v540/n7632_supp/full/540S58a.html?WT.ec_id=NATURE-20161208&spMailingID=52940554&spUserID=MjA1NzU1ODMzOQS2&spJobID=1061382989&spReportId=MTA2MTM4Mjk4OQS2

Behind New Zealand's wild plan to purge all pests

By 2050, New Zealand plans to be rid of all of its numerous invasive pests, such as the rats, mice, stoats and the Australian brush tail possum. New Zealand was an island of small lizards and birds, such as the famous kiwi. However, around 750 years ago, humans arrived and the number of species of native fauna has nearly halved and at least 51 species of birds have disappeared.

The pests are also a drain on the economy as the government spends around \$NZ70 million per year on pest-control programmes as well as around NZ\$3.3 billion in lost productivity. Many of the programmes used are well-established such as bait stations laced with poison. However, new technologies using poisons which target specific species, improved traps that need minimal human intervention and drones which have biosensors to sniff out targets and then drop a precise dose of poison are being explored. There is also research in techniques which can alter genes that are important for survival or reproduction or that could make an animal more vulnerable to specific poisons.

Some of the techniques are still a way off and not all will work in all of the areas, so public support and co-operation is an important factor. Fortunately, the people of New Zealand seriously believe in conservation as thousands of community groups already volunteer their time setting and checking traps. Financial support is another issue and although the government and other groups have committed funds, there is a shortfall. However, there is hope that further scientific breakthroughs will bring the cost down and make the plan a reality. Read more at: http://www.nature.com/news/behind-new-zealand-s-wild-plan-to-purge-all-pests-1.21272?WT.ec_id=NEWS-20170112&spMailingID=53183839&spUserID=MTc2Njc3MzgzMwS2&spJobID=1082216099&spReportId=MTA4MjIxNjA5OQS2

3Rs Grant Funding Opportunity

The Universities Federation for Animal Welfare (UFAW) is offering a grant of up to £20,000 for innovative research or other proposals which will advance the Replacement, Refinement or Reduction of the use of animals in scientific research or testing. For more information and to download an application form, please see: <https://www.ufaw.org.uk/ufaw-replacement-refinement-and-reduction-3rs-award>

Before completing the form please also read our funding FAQ at www.ufaw.org.uk/FAQ. The deadline for receipt of initial concept notes is Monday 24 July.

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The opinions expressed in ANZCCART NEWS are not necessarily those held by ANZCCART.

Contributions to ANZCCART NEWS are welcome and should be sent to the Australian Office of ANZCCART.

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