

Providing animal technicians with the latest news from the NC3Rs

Tech3Rs

Welcome to the first edition of Tech3Rs. We've launched this regular newsletter to share updates with you on recent advances in the 3Rs and to highlight new resources, research and events that we think will be of interest to you.

This newsletter is for animal technicians working in licensed establishments, to help with identifying opportunities to embed the 3Rs in practice and ensure high standards of animal welfare. If you have any ideas for future issues, or are working on a 3Rs approach you would like us to feature, please get in touch – we would love to hear from you! You can email us at tech3Rs@nc3rs.org.uk

This newsletter is available in hard copy to be distributed or displayed at your facility. Alternatively, an online version is available. If you would like further details or to request future issues of this newsletter, please visit www.nc3rs.org.uk/tech3rs



Mouse aggression study

Thanks to everyone who contributed to our mouse aggression crowdsourcing study. Your efforts have allowed us to gather data across many facilities on multiple factors which may trigger aggression and we couldn't have done it without you.

Aggression in male mice is a serious welfare concern and evidence is lacking to make decisions on reducing the incidence of aggression in the laboratory. To understand the causes and triggers of aggression, we called upon animal care staff to support us in carrying out a crowdsourcing study. In total 143 technicians from 44 facilities participated and collected data about incidents of aggression in group-housed male laboratory mice over a four-week period. Over 750 incidents of aggression were reported across a sample population of more than 130,000 mice. Those of you who participated were also awarded with 10 CPD credits from the Institute of Animal Technology.

We have analysed the data and are now writing a report for publication in a peer-reviewed journal. We will make the results available to those of you who participated ahead of publication. The results will be used to generate the much-needed evidence base to inform best practice. We will provide practical recommendations for you to use in your facilities to help in minimising aggressive behaviour in group-housed male mice.

Further information:
www.nc3rs.org.uk/labmouseaggression

Mouse handling made easy

Are you looking for a quick way to get all the essential information on refined methods of picking up a mouse? Our latest webinar, available to watch for free online, will provide you with the information and practical tips you need to get started with best practice in mouse handling at your establishment.

Why should we avoid picking up mice by the tail?

Research has shown that picking up mice by the tail induces aversion to the handler and high anxiety levels in the animals. In comparison, the use of a tunnel or hand-cupping mice considerably reduces stress and anxiety. As many of you are reporting, this results in animals that are much more willing to voluntarily interact with the handler.

We recently hosted a webinar with Professor Jane Hurst, University of Liverpool, who led the team developing this research, to share the scientific evidence base supporting refined handling techniques and to provide practical tips for implementing the methods in facilities. If you missed the webinar, the video is available to

watch on our website. The audience were invited to send questions to Jane, which have been answered in the FAQs available on our website.

Our 'How to pick up a mouse' website hub is dedicated to helping you implement these refined handling techniques. The hub provides a series of resources on non-aversive handling methods which can be used when encouraging widespread uptake in your facility and during staff training. This includes a video tutorial, posters for display in laboratories, research papers underpinning the methods, and an example strategy for rolling out the refined methods.

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If you would like to find out more, we are hosting a free mouse handling workshop (see the back page for upcoming events). Contact us if you think we can help you further: enquiries@nc3rs.org.uk

Further information:
www.nc3rs.org.uk/mousehandling



Spotlight on the NC3Rs e-learning resources

We provide a range of e-learning resources to help you fulfil training requirements in laboratory animal anaesthesia, welfare assessment and euthanasia. These training aids are developed by Professor Paul Flecknell and his colleagues at Newcastle University.

The online resources give you the freedom over when, where and what pace you learn the training material, and offer a more convenient approach over traditional learning methods. They use a scenario-based approach to deliver the material - you are placed in realistic situations you may encounter in your own facility and asked to put your learning into practice in an interactive problem-solving format. The resources are free to access, and you can use them as an introduction to the topic, a refresher, or for more specific training necessary for CPD.

Further information:
www.nc3rs.org.uk/3Rs-resources



Highlights from our news and blog

The NC3Rs blog is a platform to talk about the research we champion and the issues we care about. It includes contributions from the NC3Rs and invited experts. Here are some recent highlights:



Re-use of needles: is this an indicator of a culture of care?

Would you inject someone with a used hypodermic needle? Inject a dog? If not, why not? So why would you use the same disposable hypodermic needle to inject more than one mouse? Dr Lucy Whitfield, Royal Veterinary College, and Dr Sally Robinson, AstraZeneca, discuss the topic of re-using hypodermic needles in day-to-day practice and why this is unacceptable.

Further information:
www.nc3rs.org.uk/needlereuse



Tickling rats: a social enrichment to improve rodent welfare

The importance of positive human-animal interactions is widely recognised for large laboratory animal species, but often ignored for the smaller rodents, despite growing evidence of benefits to their welfare. Here we highlight tickling as a social enrichment to improve rat welfare.

Further information:
www.nc3rs.org.uk/ticklingrats



Tail handling reduces the value of reward in laboratory mice

Researchers at Newcastle University found that picking up mice by the tail makes them less responsive to reward, suggesting a more depressive-like state compared to mice handled using a tunnel. This blog post discusses the findings and how the work replicates previous studies that show tail handling can be aversive to mice. Since this blog post was published, further research has been published supporting the benefits of tunnel handling (Nakamura *et al.*, 2018).

Further information:
www.nc3rs.org.uk/tailhandling

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3Rs papers of interest

Each issue we feature three recent 3Rs publications of interest. We provide summaries and links to the full articles for further information. This issue we are looking at environmental enrichment, transportation of *Xenopus laevis* and understanding mouse aggression.



Laboratory mouse housing conditions can be improved using common environmental enrichment without compromising data (André *et al.*, 2018)

- Environmental enrichment is known to help improve the well-being of laboratory animals. However, there are concerns that introducing enrichment items can prevent comparison between past and future experimental results.
- The aim of this study was to investigate the effect of commonly used environmental enrichment on a wide range of physiological parameters in a systematic study design.
- Authors measured the effect of three different enrichment scenarios: 1) nesting material with shelter; 2) nesting material without a shelter; and 3) no enrichment. They measured changes in 164 physiological parameters and the influence of environmental enrichment on these parameters was found to be negligible.
- This study provides a broad summary of the impact of environmental enrichment and shows common environmental enrichment can be added to mouse cages without compromising scientific data.

Effects of transportation, transport medium and re-housing on *Xenopus laevis* (Daudin) (Holmes *et al.*, 2018) – NC3Rs funded research

- Transport of laboratory animals is a significant stressor and further understanding of the immediate and longer-term effects is crucial in order to refine the transport process.
- The aim of this study was to evaluate the impacts of transportation and re-housing on the welfare of the common laboratory amphibian *Xenopus laevis*.
- Authors developed a non-invasive physiological assay to measure the impacts of transportation. Transportation caused an increase in water-borne stress hormones and a decrease in body mass.
- The study showed the process of transportation and re-housing is stressful in this species and caused prolonged impacts. The authors provide some discussion about possible refinements, including changing the transportation medium and feeding schedules.

Breaking up is hard to do: Does splitting cages of mice reduce aggression? (Blankenberger *et al.*, 2018)

- Aggression in group-housed male mice is a common welfare issue. Current standard practice is to remove and singly house the presumed aggressor, leading to a separate welfare issue.
- The aim of this study was to evaluate best practices in separating mice following aggression and understanding the likely outcomes of cage separation. The authors tested the hypothesis that the unwounded mouse is the aggressor, and that aggression is reduced in his absence.
- Authors separated cages of mice with fighting wounds into cages of wounded and unwounded mice and recorded aggressive behaviour and wound healing rates. The results supported the hypothesis that the unwounded mouse was the aggressor, as mice in cages with an unwounded mouse healed more slowly than those without.
- The study showed that separation into groups of two or three could be a possible management alternative to social isolation of the presumed aggressor.

CRACK IT

Solutions

Are you interested in helping to develop new approaches for improving animal welfare? Are you already involved in developing novel enrichments or other methods to help improve welfare and are seeking partners to help validate or adopt these? If you answered “yes” to either of these questions, then read on to discover how the CRACK IT Solutions technology partnering hub could support you.

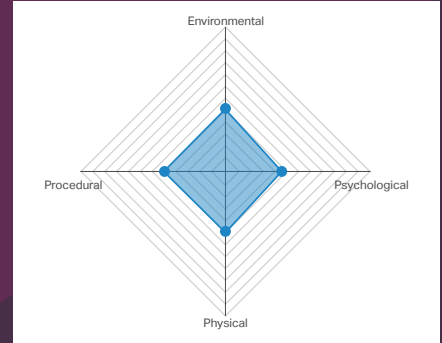
CRACK IT Solutions is an NC3Rs initiative to showcase technologies or methods with 3Rs potential ('Solutions') to other laboratories. We can help you find partners to develop your new approach and you can apply for funding to push your

idea forward. If you would like more information, visit the website www.crackit.org.uk/solutions or get in touch: crackitenquiries@nc3rs.org.uk

Example of a CRACK IT Solution: The Animal Welfare Assessment Grid (AWAG)

A current Solution being promoted is the Animal Welfare Assessment Grid (AWAG), developed by Public Health England (PHE) to improve the way animal welfare data is collected and presented. The AWAG is a software system for assessing the lifetime experience of individuals or groups of animals. It allows an animal's current and past welfare state to be quantified and presented in a graphical way that is consistent and easily understood, highlighting key events that affect well-being and identifying where welfare improvements can be made.

The PHE team is keen to hear from technicians and animal care staff interested in trialling the AWAG system in their organisation. They are looking for feedback to support the improvement of the system.



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Further information about the AWAG project: www.crackit.org.uk/awag

Listen to the “3 Minute 3Rs” Podcast

Have you checked out our “3 Minute 3Rs” podcast? We’ve teamed up with LabAnimal and the North American 3Rs Collaborative to bring you a monthly podcast giving you the lowdown on the latest research and news in 3Rs in just a few minutes. Past episodes have covered a wide range of topics including environmental enrichment to improve stress responses in zebrafish, rat training without water restriction, and anaesthesia for *Xenopus laevis*.

You can find “3 Minute 3Rs” anywhere you get podcasts by

searching for “LabAnimal” or visit www.nc3rs.org.uk/podcast to listen to all the past episodes.



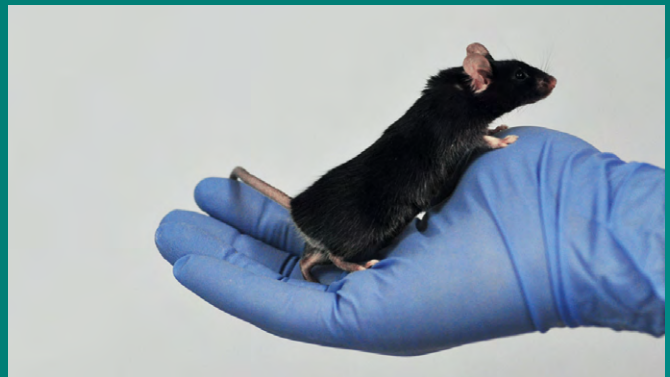
Upcoming events



NC3Rs Primate Welfare Meeting Thursday 15 November, central London

Our annual Primate Welfare Meeting is a chance to share best practice in the use and care of non-human primates (NHPs). This meeting covers the latest developments in NHP husbandry and training, the refinement of scientific procedures, advances in welfare assessment and other topics, with plenty of opportunities to network with colleagues in NHP research, breeding and management. Laboratory personnel working directly with NHPs are eligible to attend.

Register at www.nc3rs.org.uk/pwm2018



NC3Rs Mouse Handling Workshop Monday 26 November, central London

We are hosting a free mouse handling workshop to further support establishments to adopt the refined techniques. This event is a repeat of our September 2017 workshop. It is open to all animal technicians, but trainers, NTCOs and other named persons are particularly encouraged to attend. Come along to refresh your knowledge about refined handling methods, gain practical advice and tips, have your questions answered by experienced users, and explore potential barriers and solutions to uptake at your establishment.

Register at www.nc3rs.org.uk/mousehandling2018

3Rs champion

Have you thought of a novel enrichment idea, helped to develop a refined technique for a common procedure, or inspired researchers to reduce the number of animals? We would love to hear from you.

Each issue we would like to highlight animal technicians who are championing the 3Rs at their establishment. This is your chance to feature in Tech3Rs and share your work with others to help drive better science and improve animal welfare.

If you would like to feature in the next issue, or nominate a colleague for their work, please email: tech3Rs@nc3rs.org.uk

References for further information:

André V *et al.* (2018) Laboratory mouse housing conditions can be improved using common environmental enrichment without compromising data. *PLOS Biology* 16(4):e2005019. doi:[10.1371/journal.pbio.2005019](https://doi.org/10.1371/journal.pbio.2005019)

Blankenberger *et al.* (2018). Breaking up is hard to do: Does splitting cages of mice reduce aggression? *Appl Anim Behav Sci* 206:94-101. doi:[10.1016/j.applanim.2018.06.003](https://doi.org/10.1016/j.applanim.2018.06.003)

Holmes *et al.* (2018) Effects of transportation, transport medium and re-housing on *Xenopus laevis* (Daudin). *Gen Comparative Endocrinol* 266:21-28. doi:[10.1016/j.ygcen.2018.03.015](https://doi.org/10.1016/j.ygcen.2018.03.015)

Nakamura *et al.* (2018) Tunnel use facilitates handling of ICR mice and decreases experimental variation. *J Vet Med Sci* 80(6):886-892. doi:[10.1292/jvms.18-0044](https://doi.org/10.1292/jvms.18-0044)