

University of Cambridge 3Rs Strategy

Background: The NC3Rs released guidance in 2021 on the development and implementation of an institutional 3Rs strategy. This guidance is aimed at allowing organisations to identify areas where opportunities are available for actions to improve engagement and advancement of the 3Rs. University Biomedical Services (UBS) are putting together a strategy using this guidance to improve 3Rs uptake at the University of Cambridge.

Current Position:

To measure the effectiveness of the 3Rs strategy it is important to understand how the 3Rs are engaged with and implemented at the University of Cambridge currently to act as a benchmark. To aid with this UBS have completed the NC3Rs Self-Assessment Tool (SAT) which identifies areas where the organisation is already performing well and areas that could be improved upon.

Some of the aspects identified that the University of Cambridge performs well in include having an animal welfare policy that is publicly available and a departmental newsletter that is circulated to project licence holders, personal licence holders and Named People. There is also a subgroup of the AWERB Committee known as the 3Rs Committee that meets regularly to focus on the 3Rs objectives of AWERB. The AWERB also has a specific sub-committee for ethical review of non-regulated work and overseas work that involves the University of Cambridge in some capacity.

The Colony Management group that meets regularly promotes training and resources that ultimately lead to reduction and staff at all levels are encouraged to attend 3Rs related CPD and events. The researchers regularly publish 3Rs achievements and disseminate negative results.

However there are some areas that the SAT suggested could be improved. These included creating an overarching 3Rs strategy to help guide and focus efforts moving forward. It is also suggested that activities specific to each of the 'R's are held and internal 3Rs Champions are appointed to aid in promoting these events and any new advances. Holding a 3Rs symposium and providing 3Rs awards would also celebrate and further promote the 3Rs activities taking place.

Another key area that the SAT identified to work on is experimental design and reporting. An important aspect of this is access to a biostatistician both in AWERBs and more generally to provide advice on experimental design at all stages of research.

To provide some benchmarks the current figures on animal usage have been reviewed:

- Severe Severity protocols: Figures listed in Table 2 show the species that can be used in severe protocols, the number of severe protocols they are authorised on and the number of individual animals authorised on these protocols. As of 29th July 2024 there are 25 PPLs active at the University of Cambridge with one or more severe severity protocol.
- Return of Procedures: Figures listed in Table 3 show a gradual increase in number of procedures performed in the past 5 years. The severities assigned to these procedures remains roughly proportional across the 5 years, with only non-recovery procedures remaining consistent in numbers, and therefore representing a smaller proportion over time.
- Non-Regulated Procedures: The university maintains oversight of both non-regulated and overseas work by encouraging those conducting non-regulated research to complete a non-regulated procedures request form, the details of which are specified in Table 4. Interestingly between 2022 and 2023 the number of requests increased but number of animals decreased.

Overall Aim: All those involved in animal research at the University of Cambridge – including Named People, scientists and animal care staff – actively consider the 3Rs at all parts and times of the animal research process, providing a holistic approach to the 3Rs within the University of Cambridge.

Specific Objectives:

Objectives are listed in table 1 below. It is expected that these objectives will take a number of years to fully complete.

Table 1: This table shows areas that require improvement at the University of Cambridge, and the SMART objective that will be used to measure improvement in that area.

| Area | Objective |
|----------------------------------|---|
| Symposium | To hold an annual one-day 3Rs symposium involving talks and posters from University staff. |
| Strategy | Create 3Rs strategy document including specific objectives that has been approved by UBSGS |
| Biostatistician | Make contact with biostatisticians in relevant departments. |
| Reduce Severe Suffering | Hold RSPCA led workshops on roadmap to reducing severe suffering. Following this apply learnings to severe severity protocols, reducing the number of animals and number of protocols recorded as severe. |
| Retrospective Review Data | Improve the RR questions to get better data that is more specific and quantitative, particularly considering ARRIVE compliance and negative results. |
| Return of Procedures | Improve recording and review of annual figures to allow quantitative measurement of changes. Improve quantification of non-regulated animal use each year. |
| Continual Improvement | Review the objectives listed and figures quoted in current position section annually to identify any trends and areas where further work is required. |
| Root Cause Analyses | Reduce the frequency of occurrence of common incidents that have the potential to cause pain, suffering, distress or lasting harm. |
| Reduction | Quantify tissue and animal sharing across UBS, and promote further sharing to reduce the number of animals used. |

Supporting Information:

This section contains data that can be used as an objective benchmark to monitor progress on some of the objectives listed and provide an overall understanding of the University of Cambridge's position in improving 3Rs uptake.

Table 2: This table shows the species authorised on severe severity protocols at the University of Cambridge, the number of protocols each species is authorised on and the total number of individual animals permitted across these protocols. Typically, each protocol specifies what proportion of animals will experience severe severity, so it is not expected that the number of animals listed will all experience severe severity.

| Species | Number of protocols | Number individual animals |
|-----------------------|---------------------|---------------------------|
| Mouse | 36 | 45590 |
| Rat | 10 | 3060 |
| Naked Mole Rat | 1 | 50 |
| Zebrafish | 1 | 9000 |
| Medaka | 1 | 3000 |

| Severity | 2019 | 2020 | 2021 | 2022 | 2023 |
|---------------------|--------|--------|--------|--------|--------|
| Subthreshold | 53584 | 66436 | 81569 | 83670 | 82369 |
| Non-Recovery | 1942 | 1434 | 1041 | 1557 | 1535 |
| Mild | 42192 | 94575 | 87971 | 84742 | 97556 |
| Moderate | 15125 | 13376 | 26258 | 34901 | 38794 |
| Severe | 1797 | 1398 | 2364 | 2122 | 3533 |
| Total | 114640 | 177219 | 199203 | 206992 | 223787 |

Table 3: This table shows the total number of procedures performed each year at University of Cambridge from 2019 to 2023. Each year is further divided into the number of procedures of each actual severity category.

Table 4: The number of non-regulated procedure requests made, the species they include and the number of individual animals requested on each. * denotes that some requests for that species did not include the number of individual animals they planned to use. Therefore the number listed is likely to be inaccurate. The number of requests without animal numbers listed are then provided in the subsequent column.

| Species | 2022 | | | 2023 | | |
|-------------------------------|--------------------|--------------------|---------------------------------|--------------------|--------------------|---------------------------------|
| | Number of requests | Individual animals | Requests without animal numbers | Number of requests | Individual animals | Requests without animal numbers |
| Mouse | 27 | 2226* | 4 | 22 | 3166* | 1 |
| Rat | 8 | 586 | 0 | 17 | 1776* | 1 |
| Rodent (other) | 0 | 0 | 0 | 4 | 30 | 0 |
| Aquatic | 11 | 597* | 4 | 14 | 1910 | 1 |
| Avian (including eggs) | 12 | 6728* | 3 | 9 | 290 | 2 |
| Other | 7 | 261* | 1 | 9 | 207 | 1 |
| Total | 65 | 10,398 | 12 | 75 | 7379 | 6 |



Agreed and signed off by the Establishment Licence holder and the UBS Director for Governance and Welfare on 28th May 2025 in accordance with the 31st March 2025 UBSGSC meeting action.