National Centre
for the Replacement
Refinement & Reduction
of Animals in Research

NC3Rs gateway – Guidance for preparing a Stage 2 Registered Report Research Article

The aim of this document is to guide NC3Rs-funded researchers through the process of preparing a Stage 2 Registered Report for the gateway. This document should be used in conjunction with the guidance for authors provided by F1000Research on 'Preparing a Registered Report' and 'Preparing a Research Article'.

Scope

Stage 2 Registered Reports should describe the characterisation or validation of a 3Rs model/ tool/ technology. They can only be submitted following the approval of a Stage 1 Registered Report, and subsequent collection of the data. The two articles will be linked and denoted by a Registered Report badge.

Registered Reports can include studies to demonstrate the utility of the 3Rs approach and to encourage adoption by the target end-users and wider scientific community, or comparison(s) against the current gold standard or commonly used animal models. Articles should be written with a target audience in mind, typically mammalian/ vertebrate model users. The 3Rs relevance and impact of the model/ tool/ technology should be embedded throughout the article, and where appropriate, be supported by metrics.

Format

Stage 2 Registered Reports should follow the format of a Research Article. In most cases, the following standard format will be the most appropriate:

- Abstract
- Introduction
- Methods
- Results
- Conclusions/Discussion
- Research highlights (this will be a stand-alone box)

Important details to include

Title:

The title must begin with Stage 2 Registered Report.

Abstract:

The abstract must include a link to the approved Stage 1 protocol on the NC3Rs gateway.

Introduction and Methods:

Apart from minor stylistic revisions, the Introduction cannot be altered from the approved Stage 1 Study Protocol, and the stated hypotheses cannot be amended or appended. At Stage 2, any description of the rationale or proposed methodology that was written in future tense in the Stage 1 publication should be changed to past tense. Any textual changes to the Introduction or Methods (e.g. correction of typographic errors) must be clearly marked in the Stage 2 submission. Any relevant literature that became available following the date of publication of the Stage 1 Study Protocol should be included in the Discussion.

Results and Discussion/ Conclusions

The outcome of all analyses outlined in the Stage 1 Study Protocol must be reported in the manuscript, except in rare instances where an approved analysis is subsequently shown to be logically flawed or unfounded. In such cases, reviewers must agree that a collective error of judgment was made and that the analysis is inappropriate. In such cases, the analysis would still be mentioned in the Methods but omitted with justification from the Results.

It is reasonable that authors may wish to include additional analyses that were not included in the Study Protocol. For instance, a new analytic approach might become available between publication of the Study Protocol and Stage 2, or a particularly interesting and unexpected finding may emerge. Such analyses are admissible but must be clearly justified in the text, appropriately caveated, and reported in a separate section of the Results titled "Exploratory analyses". Authors should be careful not to base their conclusions entirely on the outcome of statistically significant post-hoc analyses.

For articles that describe the use of animal models, including invertebrate models (such as Drosophila or C. elegans) or non-protected immature forms of vertebrates (such as embryonic or foetal forms), the article must comply with the ARRIVE guidelines.

Considerations specific to the Results section:

- Authors reporting null hypothesis significance tests are required to report exact p values and effect sizes for all inferential analyses.
- All articles reporting new research findings must be accompanied by the underlying source data, together with details of any software used to process the results. Please include details of how the data were analysed to produce the various results (tables, graphs, etc.) shown (i.e. what statistical tests were used). If a piece of software code was used, please provide details of how to access this code (if not proprietary). See also F1000Research Data Preparation guidelines for further guidance on data presentation and formatting.
- If you have already deposited your datasets or used data that are already available online or elsewhere, please include a 'Data Availability' section, providing full details of how and where the data can be accessed, including the DOI. Please also provide details of the license under which the data can be used.
- If you are describing new software, please make the source code available on a Version Control System (VCS) such as GitHub, BitBucket or SourceForge, and provide details of the repository and the license under which the software can be used in the article.
- The F1000Research team will assist with data and/or software deposition and help generate this section, where needed F1000Research will be happy to advise.

Considerations specific to the Discussion section:

- Describe the transferability of your 3Rs model/ tool/ technology. Include a careful consideration of the barriers to uptake for potential end-users and potential solutions to address/ overcome these.
- Describe the translatability of your 3Rs model/ tool/ technology. To which types of scientific question/ remit/ discipline could the 3Rs approach be (or not be) applied?
- Consider the measure(s) of success/ acceptance test(s) that could be used by another end-user of the 3Rs model/ tool/ technology to demonstrate that it is fit for purpose. For example, what performance characteristics are needed in order to demonstrate utility and build confidence in using the 3Rs model/ tool/ technology to address scientific questions?
- Address why it is important for your 3Rs approach to be adopted by others; summarise the scientific and 3Rs benefits of taking up your 3Rs model/tool/technology.
- Quantify the 3Rs impact of the model/tool/technology described, where appropriate. For example, how many animals have been affected/ are no longer used locally (e.g. in your laboratory, department or institution)/ in the UK/ internationally? Has the severity classification of the procedure or model been affected (e.g. from severe to moderate)?

Research highlights (stand-alone box):

In the manuscript, include a separate section called 'Research highlights'. This feature will provide the reader with a quick, structured overview of the approach described in your article both from a scientific and a 3Rs perspective.

Provide concise bullet-point responses to the following questions (multiple bullet-points can be listed for each question, and if some questions are not applicable to your article they may be omitted):

- What are the scientific benefits?
- What are the 3Rs benefits?
- Are there any practical benefits? For example; cost effective, time, difficulty/ complexity, etc.
- What can the approach be applied to currently?
- What are the potential future applications of the approach?

Box template:

Research highlights	
Scientific benefit(s):	
3Rs benefit(s):	
Practical benefit(s):	
Current applications:	
Potential applications:	