The ARRIVE guidelines 2.0: author checklist

The ARRIVE Essential 10

These items are the basic minimum to include in a manuscript. Without this information, readers and reviewers cannot assess the reliability of the findings.

| Item | Recommendation | Section/line number, or reason for not reporting |
|------|----------------|-----------------------------------------------|
| Study design | 1 For each experiment, provide brief details of study design including: | Methods/lines 118 to 121 |
| | a. The groups being compared, including control groups. If no control group has been used, the rationale should be stated. | |
| | b. The experimental unit (e.g. a single animal, litter, or cage of animals). | Methods/lines 118 to 121 |
| Sample size | 2 | Methods/line 113 |
| | a. Specify the exact number of experimental units allocated to each group, and the total number in each experiment. Also indicate the total number of animals used. | Methods/line 113 |
| | b. Explain how the sample size was decided. Provide details of any a priori sample size calculation, if done. | Methods/line 113 |
| Inclusion and exclusion criteria | 3 a. Describe any criteria used for including and excluding animals (or experimental units) during the experiment, and data points during the analysis. Specify if these criteria were established a priori. If no criteria were set, state this explicitly. | Methods/lines 125 to 128 |
| | b. For each experimental group, report any animals, experimental units or data points not included in the analysis and explain why. If there were no exclusions, state so. | Methods/lines 125 to 128 |
| | c. For each analysis, report the exact value of \( n \) in each experimental group. | Methods/line 150 |
| Randomisation | 4 a. State whether randomisation was used to allocate experimental units to control and treatment groups. If done, provide the method used to generate the randomisation sequence. | Methods/lines 118 to 119 |
| | b. Describe the strategy used to minimise potential confounders such as the order of treatments and measurements, or animal/cage location. If confounders were not controlled, state this explicitly. | Methods/lines 118 to 119 |
| Blinding | 5 Describe who was aware of the group allocation at the different stages of the experiment (during the allocation, the conduct of the experiment, the outcome assessment, and the data analysis). | Methods/lines 108 to 143 |
| Outcome measures | 6 a. Clearly define all outcome measures assessed (e.g. cell death, molecular markers, or behavioural changes). | Methods/lines 140 to 143 |
| | b. For hypothesis-testing studies, specify the primary outcome measure, i.e. the outcome measure that was used to determine the sample size. | Methods/lines 140 to 143 |
| Statistical methods | 7 a. Provide details of the statistical methods used for each analysis, including software used. | Methods/lines 197 to 201 |
| | b. Describe any methods used to assess whether the data met the assumptions of the statistical approach, and what was done if the assumptions were not met. | Methods/lines 197 to 201 |
| Experimental animals | 8 a. Provide species-appropriate details of the animals used, including species, strain and substrain, sex, age or developmental stage, and, if relevant, weight. | Methods/lines 113 to 118 |
| | b. Provide further relevant information on the provenance of animals, health/immune status, genetic modification status, genotype, and any previous procedures. | Methods/lines 113 to 118 |
| Experimental procedures | 9 For each experimental group, including controls, describe the procedures in enough detail to allow others to replicate them, including: | Methods/lines 140 to 143 |
| | a. What was done, how it was done and what was used. | Methods/lines 140 to 143 |
| | b. When and how often. | Methods/lines 140 to 143 |
| | c. Where (including detail of any acclimatisation periods). | Methods/lines 140 to 143 |
| | d. Why (provide rationale for procedures). | Methods/lines 140 to 143 |
| Results | 10 For each experiment conducted, including independent replications, report: | Results/line 203 |
| | a. Summary/descriptive statistics for each experimental group, with a measure of variability where applicable (e.g. mean and SD, or median and range). | Results/line 203 |
| | b. If applicable, the effect size with a confidence interval. | Results/line 203 |
| Item                | Recommendation                                                                                                                                                                                                 | Section/line number, or reason for not reporting                                      |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Abstract            | Provide an accurate summary of the research objectives, animal species, strain and sex, key methods, principal findings, and study conclusions.                                                         | Abstract/lines 25                                                                       |
| Background          | a. Include sufficient scientific background to understand the rationale and context for the study, and explain the experimental approach.                                                               | Background/lines 61 to 102                                                              |
|                     | b. Explain how the animal species and model used address the scientific objectives and, where appropriate, the relevance to human biology.                                                                 | Background/lines 29 to 45                                                               |
| Objectives          | Clearly describe the research question, research objectives and, where appropriate, specific hypotheses being tested.                                                                                         | Background/lines 1                                                                     |
| Ethical statement   | Provide the name of the ethical review committee or equivalent that has approved the use of animals in this study, and any relevant licence or protocol numbers (if applicable). If ethical approval was not sought or granted, provide a justification. | Methods/lines 1 to 112                                                                 |
| Housing and husbandry | Provide details of housing and husbandry conditions, including any environmental enrichment.                                                                                                                | Methods/lines 1 to 1                       |
| Animal care and monitoring | a. Describe any interventions or steps taken in the experimental protocols to reduce pain, suffering and distress.                                                                                     | Methods/lines 1 to 112                                                                 |
|                     | b. Report any expected or unexpected adverse events.                                                                                                                                                         | Methods/lines 1 to 112                                                                 |
|                     | c. Describe the humane endpoints established for the study, the signs that were monitored and the frequency of monitoring. If the study did not have humane endpoints, state this. | Methods/lines 1 to 112                                                                 |
| Interpretation/ scientific implications | a. Interpret the results, taking into account the study objectives and hypotheses, current theory and other relevant studies in the literature.   | Discussion/lines 328 to 343                                                             |
|                     | b. Comment on the study limitations including potential sources of bias, limitations of the animal model, and imprecision associated with the results.                                               | Discussion/lines 431 to 435                                                             |
| Generalisability/ translation | Comment on whether, and how, the findings of this study are likely to generalise to other species or experimental conditions, including any relevance to human biology (where appropriate). | Discussion/lines 427 to 430                                                            |
| Protocol registration | Provide a statement indicating whether a protocol (including the research question, key design features, and analysis plan) was prepared before the study, and if and where this protocol was registered. | A protocol was prepared before the                                                     |
| Data access         | Provide a statement describing if and where study data are available.                                                                                                                                     | Footnote/line 45                                                                       |
| Declaration of interests | a. Declare any potential conflicts of interest, including financial and non-financial. If none exist, this should be stated.                                                                        | Footnote/line 455                                                                    |
|                     | b. List all funding sources (including grant identifier) and the role of the funder(s) in the design, analysis and reporting of the study.                                                             | Acknowledgements/lines 446 to 455                                                        |

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*As the checklist was provided upon initial submission, the page line number reported may be changed due to copyediting and may not be referable in the published version. In this case, the section may be used as an alternative reference.