# Materials Design Analysis Reporting (MDAR) Checklist for Authors

The MDAR framework establishes a minimum set of requirements in transparent reporting applicable to studies in the life sciences (see Statement of Task: doi:10.31222/osf.io/9sm4x.). The MDAR checklist is a tool for authors, editors and others seeking to adopt the MDAR framework for transparent reporting in manuscripts and other outputs. Please refer to the MDAR Elaboration Document for additional context for the MDAR framework.

## Materials

| Antibodies | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| For commercial reagents, provide supplier name, catalogue number and RRID, if available. | section: Methods(line 191-194) | |

| Cell materials | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| **Cell lines:** Provide species information, strain. Provide accession number in repository **OR** supplier name, catalog number, clone number, **OR** RRID | section: Methods(line 112-113) | |
| **Primary cultures:** Provide species, strain, sex of origin, genetic modification status. | No primary culture was performed in this study | n/a |

| Experimental animals | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| **Laboratory animals:** Provide species, strain, sex, age, genetic modification status. Provide accession number in repository **OR** supplier name, catalog number, clone number, **OR** RRID | No animal experiments were performed in this study | n/a |
| **Animal observed in or captured from the field:** Provide species, sex and age where possible | No animal experiments were performed in this study | n/a |
| **Model organisms:** Provide Accession number in repository (where relevant) **OR** RRID | No model organisms were performed in this study | n/a |

| Plants and microbes | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| **Plants:** provide species and strain, unique accession number if available, and source (including location for collected wild specimens) | No plants were performed in this study | n/a |
| **Microbes:** provide species and strain, unique accession number if available, and source | No model organisms were performed in this study | n/a |

| Human research participants | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| Identify authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval. | No human research participants were involved in this study | n/a |
| Provide statement confirming informed consent obtained from study participants. | No human research participants were involved in this study | n/a |
| Report on age and sex for all study participants. | No human research participants were involved in this study | n/a |

## Design

| Study protocol | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| For clinical trials, provide the trial registration number **OR** cite DOI in manuscript. | This study is not a clinical trial | n/a |

| Laboratory protocol | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| Provide DOI or other citation details if detailed step-by-step protocols are available. | The detailed steps of this experiment can be obtained from the corresponding author by email at reasonable | n/a |

| Experimental study design (statistics details) | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| State whether and how the following have been done**, or** if they were not carried out. | This study is not a clinical trial | n/a |
| Sample size determination | This study is not a clinical trial | n/a |
| Randomisation | This study is not a clinical trial | n/a |
| Blinding | This study is not a clinical trial | n/a |
| Inclusion/exclusion criteria | This study is not a clinical trial | n/a |

| Sample definition and in-laboratory replication | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| State number of times the experiment was replicated in laboratory | section: Statistical analysis of data(line 198-200) | |
| Define whether data describe technical or biological replicates | section: Statistical analysis of data(line 198-200) | |

| Ethics | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| Studies involving human participants: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval. | Ethics were not involved in this study | n/a |
| Studies involving experimental animals: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval. | Ethics were not involved in this study | n/a |
| Studies involving specimen and field samples: State if relevant permits obtained, provide details of authority approving study; if none were required, explain why. | Ethics were not involved in this study | n/a |

| Dual Use Research of Concern (DURC) | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| If study is subject to dual use research of concern, state the authority granting approval and reference number for the regulatory approval | Dual use research of concern was not involved in this study | n/a |

## Analysis

| Attrition | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| State if sample or data point from the analysis is excluded, and whether the criteria for exclusion were determined and specified in advance. | sample or data point from the analysis was not excluded | n/a |

| Statistics | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| Describe statistical tests used and justify choice of tests. | section: Statistical analysis of data(line 198-200) | |

| Data Availability | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| State whether newly created datasets are available, including protocols for access or restriction on access. | Section: Data Availability(line 331) | |
| If data are publicly available, provide accession number in repository or DOI or URL. | Section: Data Availability(line 331) | |
| If publicly available data are reused, provide accession number in repository or DOI or URL, where possible. | Section: Data Availability(line 331) | |

| Code Availability | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| For all newly generated code and software essential for replicating the main findings of the study: | Code not covered in this study | n/a |
| State whether the code or software is available. | Code not covered in this study | n/a |
| If code is publicly available, provide accession number in repository, or DOI or URL. | Code not covered in this study | n/a |

## Reporting

| Adherence to community standards | Yes (indicate where provided: section/paragraph) | n/a |
|---|---|---|
| MDAR framework recommends adoption of discipline-specific guidelines, established and endorsed through community initiatives. Journals have their own policy about requiring specific guidelines and recommendations to complement MDAR. | | |
| State if relevant guidelines (eg., ICMJE, MIBBI, ARRIVE) have been followed, and whether a checklist (eg., CONSORT, PRISMA, ARRIVE) is provided with the manuscript. | ICMJE guidelines were followed, as the journal follows ICMJE recommendations for publication. | |

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