

## **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](https://doi.org/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**

<b>Antibodies</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
For commercial reagents, provide supplier name, catalogue number and RRID, if available.	Material and Methods: line 105-162	
<b>Cell materials</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
<b>Cell lines:</b> Provide species information, strain. Provide accession number in repository <b>OR</b> supplier name, catalog number, clone number, <b>OR</b> RRID	Material and Methods: line 105-111	
<b>Primary cultures:</b> Provide species, strain, sex of origin, genetic modification status.		✓
<b>Experimental animals</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
<b>Laboratory animals:</b> Provide species, strain, sex, age, genetic modification status. Provide accession number in repository <b>OR</b> supplier name, catalog number, clone number, <b>OR</b> RRID		✓
<b>Animal observed in or captured from the field:</b> Provide species, sex and age where possible		✓
<b>Model organisms:</b> Provide Accession number in repository (where relevant) <b>OR</b> RRID		✓
<b>Plants and microbes</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
<b>Plants:</b> provide species and strain, unique accession number if available, and source (including location for collected wild specimens)		✓
<b>Microbes:</b> provide species and strain, unique accession number if available, and source		✓
<b>Human research participants</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
Identify authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.		✓
Provide statement confirming informed consent obtained from study participants.		✓
Report on age and sex for all study participants.		✓

**Design**

<b>Study protocol</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
For clinical trials, provide the trial registration number <b>OR</b> cite DOI in manuscript.		✓
<b>Laboratory protocol</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
Provide DOI or other citation details if detailed step-by-step protocols are available.		✓
<b>Experimental study design (statistics details)</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
State whether and how the following have been done, <b>or</b> if they were not carried out.		
Sample size determination	20	
Randomisation	Line 99-104	
Blinding		✓
Inclusion/exclusion criteria	Line 99-104	
<b>Sample definition and in-laboratory replication</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
State number of times the experiment was replicated in laboratory	Material and methods section: line 112-162	
Define whether data describe technical or biological replicates	Material and methods section: line 112-162	
<b>Ethics</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
Studies involving human participants: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.	Line 99-104	
Studies involving experimental animals: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.		✓
Studies involving specimen and field samples: State if relevant permits obtained, provide details of authority approving study; if none were required, explain why.	Line 99-104	
<b>Dual Use Research of Concern (DURC)</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
If study is subject to dual use research of concern, state the authority granting approval and reference number for the regulatory approval		✓

**Analysis**

<b>Attrition</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
State if sample or data point from the analysis is excluded, and whether the criteria for exclusion were determined and specified in advance.	All data have been included in the analysis.	
<b>Statistics</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
Describe statistical tests used and justify choice of tests.	SPSS 26.0 software was used for statistical analysis, and the measurement data were described in the form of mean standard deviation. Independent sample t test was used for the analysis of the two groups of data, and single factor square difference analysis (ANOVA) was used for the comparison of the measurement data of the three groups or more, and $P < 0.05$ was selected as the standard for statistical difference. (line 164-165)	
<b>Data Availability</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
State whether newly created datasets are available, including protocols for access or restriction on access.	Data Availability Statement: Line 167	
If data are publicly available, provide accession number in repository or DOI or URL.		✓
If publicly available data are reused, provide accession number in repository or DOI or URL, where possible.		✓
<b>Code Availability</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
For all newly generated code and software essential for replicating the main findings of the study:		
State whether the code or software is available.		✓
If code is publicly available, provide accession number in repository, or DOI or URL.		✓

**Reporting**

<b>Adherence to community standards</b>	<b>Yes (indicate where provided: section/paragraph)</b>	<b>n/a</b>
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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