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.	These were not used in this experiment.	**n/a**

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	These were not used in this experiment.	**n/a**
Primary cultures: Provide species, strain, sex of origin, genetic modification status.	These were not used in this experiment.	**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	These were not used in this experiment.	**n/a**
Animal observed in or captured from the field: Provide species, sex and age where possible	These were not used in this experiment.	**n/a**
Model organisms: Provide Accession number in repository (where relevant) **OR** RRID	These were not used in this experiment.	**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)	These were not used in this experiment.	**n/a**
Microbes: provide species and strain, unique accession number if available, and source	These were not used in this experiment.	**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.	Yes(method section/page4，line16,17,18).	
Provide statement confirming informed consent obtained from study participants.	Yes(method section/page4，line16,17,18).	
Report on age and sex for all study participants.	Yes(method section/page4，line1,2,12,13).	

Design

Study protocol	Yes (indicate where provided: section/paragraph)	n/a
For clinical trials, provide the trial registration number **OR** cite DOI in manuscript.	Yes(method section/page4， line16,17,18).	

Laboratory protocol	Yes (indicate where provided: section/paragraph)	n/a
Provide DOI or other citation details if detailed step-by-step protocols are available.	No additional step-by-step methodological details beyond what is provided in methods section in the study.	**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.		
Sample size determination	Yes(method section/paragraph1,2).	
Randomisation	Yes(method section/paragraph1,2).	
Blinding	Yes(method section/paragraph1,2).	
Inclusion/exclusion criteria	Yes(method section/paragraph1,2).	

Sample definition and in-laboratory replication	Yes (indicate where provided: section/paragraph)	n/a
State number of times the experiment was replicated in laboratory	No replicated laboratory index was used in this experiment.	**n/a**
Define whether data describe technical or biological replicates	No replicated laboratory index was used in this experiment.	**n/a**

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.	Yes(method section/page4， line16,17,18).	
Studies involving experimental animals: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.	No animals were involved in this experiment.	**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.	Yes(method section/page4， line16,17,18).	

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	No dual use research of concern in the 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.	Yes(method section/page5， line17,18).	n/a

Statistics	Yes (indicate where provided: section/paragraph)	n/a
Describe statistical tests used and justify choice of tests.	Yes(method section/page6，line1-10)	

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.	Newly created datasets are not available in the study.	n/a
If data are publicly available, provide accession number in repository or DOI or URL.	Newly created datasets are not available in the study.	n/a
If publicly available data are reused, provide accession number in repository or DOI or URL, where possible.	Newly created datasets are not available in the study.	n/a

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:		n/a
State whether the code or software is available.	No newly generated code and software in the study.	n/a
If code is publicly available, provide accession number in repository, or DOI or URL.	No newly generated code and software in the 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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