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.	Yes(Supplementary Table 3)	

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	Yes(Methods/ **paragraph** 2,4)	
Primary cultures: Provide species, strain, sex of origin, genetic modification status.	It is not involved 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	It is not involved in this study	N/A
Animal observed in or captured from the field: Provide species, sex and age where possible	It is not involved in this study	N/A
Model organisms: Provide Accession number in repository (where relevant) **OR** RRID	It is not involved 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)	It is not involved in this study	N/A
Microbes: provide species and strain, unique accession number if available, and source	It is not involved 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.	It is not involved in this study	N/A
Provide statement confirming informed consent obtained from study participants.	It is not involved in this study	N/A
Report on age and sex for all study participants.	It is not 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.	It is not involved in this study	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.	It is not involved in this 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	It is not involved in this study	N/A

Randomisation	It is not involved in this study	N/A
Blinding	It is not involved in this study	N/A
Inclusion/exclusion criteria	It is not involved in this study	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	It is not involved in this study	N/A
Define whether data describe technical or biological replicates	It is not involved in this study	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.	Methods/Paragraph 2	
Studies involving experimental animals: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval.	It is 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.	It is 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	It is 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.	It is not involved in this study	N/A

Statistics	**Yes (indicate where provided: section/paragraph)**	**n/a**
Describe statistical tests used and justify choice of tests.	It is not involved in this study	N/A

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.	It is not involved in this study	N/A
If data are publicly available, provide accession number in repository or DOI or URL.	It is not involved in this study	N/A
If publicly available data are reused, provide accession number in repository or DOI or URL, where possible.	It is not involved in this 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:		
State whether the code or software is available.	It is not involved in this study	N/A
If code is publicly available, provide accession number in repository, or DOI or URL.	It is not involved 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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