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

| Category                  | Required? | Indicate Provided: Section/Paragraph | Additional Information                  |
|---------------------------|-----------|-------------------------------------|-----------------------------------------|
| Antibodies                | Yes       | (where provided: section/paragraph)  | n/a                                     |
| For commercial reagents,  | Yes       | in paragraph 1 of Materials and methods |                                          |
| provide supplier name,   |           |                                      |                                          |
| catalogue number and     |           |                                      |                                          |
| RRID, if available.      |           |                                      |                                          |
| Cell materials           | Yes       | (where provided: section/paragraph)  | n/a                                     |
| Cell lines: Provide       | Yes       | in paragraph 2 of Materials and      |                                          |
| species information,     |           | methods                               |                                          |
| strain.                  |           |                                      |                                          |
| Provide accession number  | n/a       | in repository OR supplier name,      |                                          |
| or catalog number, clone | n/a       | number, clone number, OR RRID         |                                          |
| Primary cultures:        |           | Provide species, strain, sex of      | n/a                                     |
| origin, genetic          |           | modification status.                 |                                          |
| Experimental animals     | Yes       | (where provided: section/paragraph)  | n/a                                     |
| Laboratory animals:      |           | Provide species, strain, sex, age,   | n/a                                     |
| genetic modification     |           | status. Provide accession number in  |                                          |
| status. Provide          |           | repository OR supplier name, catalog  |                                          |
| accession number, clone  | n/a       | number, OR RRID                       |                                          |
| Animal observed in or     |           | Provide species, sex and age where   | n/a                                     |
| captured from the field: |           | possible                             |                                          |
| Model organisms:         |           | Provide Accession number in          | n/a                                     |
| in repository (where     |           | relevant) OR RRID                     |                                          |
| plants and microbes      | Yes       | (where provided: section/paragraph)  | n/a                                     |
| Plants: provide species, | n/a       |                                      |                                          |
| strain, unique accession |                                      |                                          |
| number if available, and  |                                      |                                          |
| source (including location|                                      |                                          |
| for collected wild       |                                      |                                          |
| specimens)               | n/a       |                                      |                                          |
| Microbes: provide species| n/a       |                                      |                                          |
| and strain, unique       |                                      |                                          |
| accession number if      |                                      |                                          |
| available, and source    |                                      |                                          |
| Human research           | Yes       | (where provided: section/paragraph)  | n/a                                     |
| participants             |           |                                      |                                          |
| Identify authority       | n/a       |                                      |                                          |
| granting ethics approval  |                                      |                                          |
| (IRB or equivalent        |                                      |                                          |
| committee(s), provide     |                                      |                                          |
| reference number for     |                                      |                                          |
| approval.                |                                      |                                          |
| Provide statement        | n/a       |                                      |                                          |
| confirming informed      |                                      |                                          |
| consent obtained from     |                                      |                                          |
| study participants.      |                                      |                                          |
| Report on age and sex    | n/a       |                                      |                                          |
| for all study participants. |                                    |                                          |
### Design

| Study protocol | Yes (indicate where provided: section/paragraph) | n/a |
|----------------|-------------------------------------------------|-----|
| For clinical trials, provide the trial registration number OR cite DOI in manuscript. | | 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. | Yes. in the References 14,15,or according to the manufacturer’s guidelines | 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, in the Methods of Materials and methods | |
| Randomisation | Yes, in the Methods of Materials and methods | |
| Blinding | n/a | |
| Inclusion/exclusion criteria | 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 | the experiment was performed in triplicate, and results show from 3 independent experiments. | n/a |
| Define whether data describe technical or biological replicates | | |

| 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. | | n/a |
| Studies involving experimental animals: State details of authority granting ethics approval (IRB or equivalent committee(s), provide reference number for approval. | | 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. | | 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 | | n/a |
### Analysis

| Description                                      | Yes (indicate where provided: section/paragraph) | n/a |
|--------------------------------------------------|-------------------------------------------------|-----|
| 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. | | |
| Statistics                                       | Yes (indicate where provided: section/paragraph) | n/a |
| Describe statistical tests used and justify choice of tests. | Yes, in the Statistical analysis of Materials and methods | |
| 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. | | |
| If data are publicly available, provide accession number in repository or DOI or URL. | n/a |
| If publicly available data are reused, provide accession number in repository or DOI or URL, where possible. | 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. | n/a |
| If code is publicly available, provide accession number in repository, or DOI or URL. | n/a |

### Reporting

| Description                                      | Yes (indicate where provided: section/paragraph) | n/a |
|--------------------------------------------------|-------------------------------------------------|-----|
| 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 (e.g., ICMJE, MIBBI, ARRIVE) have been followed, and whether a checklist (e.g., CONSORT, PRISMA, ARRIVE) is provided with the manuscript. | ICMJE guidelines were followed as the journal follows ICMJE guidelines for publication. | |

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