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Competing interests declaration

- ☒ We declare that none of the authors have competing financial or non-financial interests as defined by Nature Portfolio.
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Large Language Models (LLMs), such as ChatGPT, do not currently satisfy our authorship criteria. Notably an attribution of authorship carries with it accountability for the work, which cannot be effectively applied to LLMs. Use of an LLM should be properly documented in the Methods section (and if a Methods section is not available, in a suitable alternative part) of the manuscript.

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Policy information about Authorship: inclusion & ethics in global research

All authors are encouraged to provide an "Inclusion & Ethics" statement where relevant.

- ☐ We have provided an "Inclusion & Ethics" statement.

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- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
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- ☒ We have provided a full data availability statement in the manuscript.

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Confirm that all relevant data are deposited into a public repository and that accession codes are provided.

- ☐ All relevant accession codes are provided ☐ Accession codes will be available before publication ☒ No data with mandated deposition

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Code availability statement

For all studies using custom code or mathematical algorithm that is deemed central to the conclusions, the manuscript must include a statement under the heading "Code availability" describing how readers can access the code, including any access restrictions. Code availability statements should be provided as a separate section after the data availability statement but before the References.

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For all data presented in a plot, chart or other visual representation confirm that:

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Does not apply

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- ☒ ☐ Macromolecular structural data
- ☒ ☐ Unique biological materials
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- ☒ ☐ Human embryos, gametes and/or stem cells
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- ☒ ☐ Clinical data
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Typed signature Yue Shen

Date Apr 6, 2025

