**Credit authorship contribution statement**

14 Contributor Roles and its definition:

**Conceptualization** – Ideas; formulation or evolution of overarching research goals and aims.

**Data curation** – Management activities to annotate (produce metadata), scrub data and maintain research data (including software code, where it is necessary for interpreting the data itself) for initial use and later re-use.

**Formal analysis** – Application of statistical, mathematical, computational, or other formal techniques to analyze or synthesize study data.

**Funding acquisition** - Acquisition of the financial support for the project leading to this publication.

**Investigation** – Conducting a research and investigation process, specifically performing the experiments, or data/evidence collection.

**Methodology** – Development or design of methodology; creation of models.

**Project administration** – Management and coordination responsibility for the research activity planning and execution.

**Resources** – Provision of study materials, reagents, materials, patients, laboratory samples, animals, instrumentation, computing resources, or other analysis tools.

**Software** – Programming, software development; designing computer programs; implementation of the computer code and supporting algorithms; testing of existing code components.

**Supervision** – Oversight and leadership responsibility for the research activity planning and execution, including mentorship external to the core team.

**Validation** – Verification, whether as a part of the activity or separate, of the overall

replication/reproducibility of results/experiments and other research outputs.

**Visualization** – Preparation, creation and/or presentation of the published work, specifically

visualization/data presentation.

**Writing** – original draft – Preparation, creation and/or presentation of the published work, specifically writing the initial draft (including substantive translation).

**Writing** – review & editing – Preparation, creation and/or presentation of the published work by those from the original research group, specifically critical review, commentary or revision – including pre- or post-publication stages.

## Sample CRediT author statement

**Emily Chen**: Conceptualization; Project Administration; Methodology. **Liam Patel**: Data Curation; Formal Analysis; Writing – Original Draft Preparation. **Sofia Rodriguez**: Visualization; Software Development. **Noah Williams**: Supervision; Funding Acquisition. **Arjun Mehta**: Validation; Investigation. **Hannah Kim**: Writing – Review & Editing ;

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