***eLife’s* transparent reporting form**

We encourage authors to provide detailed information *within their submission* to facilitate the interpretation and replication of experiments. Authors can upload supporting documentation to indicate the use of appropriate reporting guidelines for health-related research (see [EQUATOR Network](http://www.equator-network.org/%20)), life science research (see the [BioSharing Information Resource](https://biosharing.org/%22%20%5Ct%20%22_blank)), or the [ARRIVE guidelines](http://www.plosbiology.org/article/info%3Adoi/10.1371/journal.pbio.1000412) for reporting work involving animal research. Where applicable, authors should refer to any relevant reporting standards documents in this form.

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**Sample-size estimation**

* You should state whether an appropriate sample size was computed when the study was being designed
* You should state the statistical method of sample size computation and any required assumptions
* If no explicit power analysis was used, you should describe how you decided what sample (replicate) size (number) to use

Please outline where this information can be found within the submission (e.g., sections or figure legends), or explain why this information doesn’t apply to your submission:

No explicit power analysis was used, but sample sizes were chosen based on our group’s prior expertise with similar experimental design and analysis. We utilized a similar methodology in the following publications: (Jeyifous et al., 2009 ([https://dx.doi.org/10.1038%2Fnn.2362](https://dx.doi.org/10.1038/nn.2362)); Lin et al., 2013 (<https://doi.org/10.1523/JNEUROSCI.0816-13.2013>); Zheng et al., 2015 (<https://doi.org/10.7554/eLife.06878>); Jeyifous et al., 2016 (<https://doi.org/10.1073/pnas.1612963113>)).

**Replicates**

* You should report how often each experiment was performed
* You should include a definition of biological versus technical replication
* The data obtained should be provided and sufficient information should be provided to indicate the number of independent biological and/or technical replicates
* If you encountered any outliers, you should describe how these were handled
* Criteria for exclusion/inclusion of data should be clearly stated
* High-throughput sequence data should be uploaded before submission, with a private link for reviewers provided (these are available from both GEO and ArrayExpress)

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Details on the number of experimental replicates are included in the “Image analysis” section of the Methods. Briefly, for each quantitative experiment, a series of pilot studies were executed to optimize experimental conditions and assess the variability in the measured outcomes. The data analysed and presented in the present study constitute a minimum of 2 subsequent independent preparations/experiments following the pilot studies. The number of cells or image fields for each reported experimental group is stated in the associated figure legend, as well as in the source data files (Dryad submission). No outliers were excluded from any experiment.

**Statistical reporting**

* Statistical analysis methods should be described and justified
* Raw data should be presented in figures whenever informative to do so (typically when N per group is less than 10)
* For each experiment, you should identify the statistical tests used, exact values of N, definitions of center, methods of multiple test correction, and dispersion and precision measures (e.g., mean, median, SD, SEM, confidence intervals; and, for the major substantive results, a measure of effect size (e.g., Pearson's r, Cohen's d)
* Report exact p-values wherever possible alongside the summary statistics and 95% confidence intervals. These should be reported for all key questions and not only when the p-value is less than 0.05.

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All raw data values and statistical summaries containing statistical tests, exact p-values, 95% confidence intervals, etc are located in the source data files (Dryad submission).

(For large datasets, or papers with a very large number of statistical tests, you may upload a single table file with tests, Ns, etc., with reference to sections in the manuscript.)

**Group allocation**

* Indicate how samples were allocated into experimental groups (in the case of clinical studies, please specify allocation to treatment method); if randomization was used, please also state if restricted randomization was applied
* Indicate if masking was used during group allocation, data collection and/or data analysis

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Not applicable. Masking was not used during group allocation, data collection and/or data analysis.

**Additional data files (“source data”)**

* We encourage you to upload relevant additional data files, such as numerical data that are represented as a graph in a figure, or as a summary table
* Where provided, these should be in the most useful format, and they can be uploaded as “Source data” files linked to a main figure or table
* Include model definition files including the full list of parameters used
* Include code used for data analysis (e.g., R, MatLab)
* Avoid stating that data files are “available upon request”

Please indicate the figures or tables for which source data files have been provided:

Source data files for figures 1, 2, 5, 6, 7, 8, and supplemental figures, figure 1-figure supplement 2, figure 2-figure supplement 2, figure 4-figure supplements 1 and 2, and figure 7-figure supplement 2 are provided in the file, “Govind Jeyifous et al eLife manuscript source data files”.