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

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**Sample-size estimation**

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

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The number of cases, sample sizes, replication numbers used in this study were according to the common standards in the field and were described in "Materials and Methods". No explicit power analysis was used.

**Replicates**

* You should report how often each experiment was performed
* You should include a definition of biological versus technical replication
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All repeats were described in "Materials and Methods". Animals constituted biological replications. Stimulus repetitions and recording sessions constituted technical replications. This information and the numbers of these repeats were described in "Materials and Methods" and "Results". Criteria for neurons exclusion/inclusion and outliers were stated in "Materials and Methods" and FigureS1.

**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)
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Statistical analysis methods were described in “Materials and Methods” and “Results” in details. Raw data were presented in figures whenever appropriate. Information about statistical tests, N, p-value, error bar was clearly described.

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* 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
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Data and codes necessary to recreate all figures are available in Mendeley dataset as indicated in the data availability statement.