nature research

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Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Research policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☒	☐	A description of all covariates tested
☒	☐	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☒	☐	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☒	☐	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	Electrical signals were acquired with Multiclamp 700B amplifiers (Molecular Devices), low-pass filtered at 6–10 kHz, and digitized at 20 kHz with a Cambridge Electronic Design 1401 AD/DA converter (CED).
Data analysis	Analysis software is available via github (Stimfit version 0.15.8; https://github.com/neurodroid/stimfit). Further code for analysis of miniature EPSCs will be provided from the corresponding author upon reasonable request.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Research guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A list of figures that have associated raw data
- A description of any restrictions on data availability

Original data are available via the primary research article (doi: 10.1016/j.neuron.2020.05.013). Further original data are stored in the scientific repository of the Institute of Science and Technology Austria and will be provided by the corresponding author upon reasonable request.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences ☐ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size	No attempt was made to predetermine sample size. Sample size was set according to the highest numbers in previous publications.
Data exclusions	Postsynaptic recordings with resting potentials more positive than −50 mV were immediately discarded. Postsynaptic recordings with series resistance of > 10 MΩ were also rejected. Both exclusion criteria were defined at an early stage of the study.
Replication	Methods reported in this Protocol are based on ~500 paired recordings between mossy fiber terminals and CA3 pyramidal neurons. The reported methods are highly reproducible.
Randomization	Experimental procedures were not randomized. As the experiments were performed on a homogenous population of rats or mice, randomization was not necessary.
Blinding	Experiments and data analysis were not blinded. As the experiments required visually targeted patch-clamp recording, blinding was not possible.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☐	☒ Animals and other organisms
☒	☐ Human research participants
☒	☐ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Animals and other organisms

Policy information about studies involving animals; ARRIVE guidelines recommended for reporting animal research

Laboratory animals	Rats (Wistar or Sprague-Dawley) or mice (C57BL/6). Animals of either sex can be used. We recommend an age range between 19 and 23 days.
Wild animals	N/A
Field-collected samples	N/A
Ethics oversight	All animal experiments are to be performed in accordance with relevant authorities' guidelines and regulations. The experiments presented in this Protocol were carried out in strict accordance with institutional, national, and European guidelines for animal experimentation, and approved by the Bundesministerium für Wissenschaft, Forschung und Wirtschaft of Austria (A. Haslinger).

Note that full information on the approval of the study protocol must also be provided in the manuscript.