# 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 <u>Editorial Policies</u> and the <u>Editorial Policy Checklist</u>.

#### **Statistics**

For	all st	atistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.			
n/a	'a Confirmed				
$\boxtimes$		The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement			
$\boxtimes$		A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly			
$\boxtimes$		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.			
$\boxtimes$		A description of all covariates tested			
$\boxtimes$		A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons			
$\boxtimes$		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)			
$\boxtimes$		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.			
$\boxtimes$		For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings			
$\boxtimes$		For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes			
$\boxtimes$		Estimates of effect sizes (e.g. Cohen's d, Pearson's r), indicating how they were calculated			
		Our web collection on <u>statistics for biologists</u> contains articles on many of the points above.			

#### Software and code

Policy information	about <u>availability of computer code</u>
Data collection	For data acqusition spikeglx is used (https://billkarsh.github.io/SpikeGLX/).
Data analysis	To filter raw data CatGT is used (https://billkarsh.github.io/SpikeGLX/#catgt).
	To sort filtered data Kilosort2 is used (https://github.com/MouseLand/Kilosort).
	To extract spike features from filtered data neuropixels-evaluluation-tools toolbox is used (https://github.com/jenniferColonell/
	Neuropixels evaluation tools).
	To combine steps as explained above, and automatize this process, modified version of ecephys spike sorting toolbox is used (https://
	github.com/ienniferColonell/ecephys spike sorting).
	To extract unit yield, to process longitudinal data, and to generate figure panels custom written toolbox is used (https://github.com/nerf-
	common/chronic-neuropixels-protocol).

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 <u>availability of data</u>

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

Meta data and the code can be found in https://github.com/nerf-common/chronic-neuropixels-protocol

### 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 <u>nature.com/documents/nr-reporting-summary-flat.pdf</u>

## Life sciences study design

All studies must dis	close on these points even when the disclosure is negative.
Sample size	No sample-size calculation was performed. The number of animals was based on providing a clear demonstration of the protocol, but no statistical tests were performed.
Data exclusions	No data was excluded from the analyses.
Replication	The protocol was tested in multiple rats and mice with success. Failures to replicate were generally caused by physical or electrical damage to the Neuropixels probes, as described in the protocol.
Randomization	Randomization was not relevant for the study, because no experimental groups were tested.
Blinding	Blinding was not relevant for the study, because no experimental conditions were tested.

### 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.

Ma	terials & experimental systems
n/a	Involved in the study

Palaeontology and archaeology
 Animals and other organisms

Human research participants

Dual use research of concern

Antibodies

Clinical data

Eukaryotic cell lines

 $\boxtimes$ 

 $\mathbf{X}$ 

 $\boxtimes$ 

 $\boxtimes$ 

 $\boxtimes$ 

 $\boxtimes$ 

Me	thods

n/a	Involved in the study
$\boxtimes$	ChIP-seq
$\boxtimes$	Flow cytometry
$\boxtimes$	MRI-based neuroimaging

### Animals and other organisms

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

 Laboratory animals
 The study involved male Long-Evans rats (12-16 weeks old) and male C57BL/6J mice (16-20 weeks old)

 Wild animals
 The study did not involve wild animals.

 Field-collected samples
 The study did not involve samples collected from the field.

 Ethics oversight
 Animal experiment protocols were approved by the KU Leuven Animal Ethics Committee.

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