

Life Sciences Reporting Summary

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▶ Experimental design

1. Sample size

Describe how sample size was determined.

Recordings were made from cortex preparations until the main features of our results failed to behave in an unpredictable manner. For example, a single preparation yielded MEA extracellular data from hundreds of neurons and this type of experiment was repeated until spike-induced fields were characterized, understood, tested, blocked, and until further experiments yielded no new knowledge. To reach this point, the number of experiments varied between ca. 5 and ca. 30, depending on the features tested and the difficulty of the experiment.

2. Data exclusions

Describe any data exclusions.

Every MEA recording yielded a large number of sorted units (many hundreds to ca. 1500). This number depended on the separation criteria used, which were chosen according to the hypothesis tested. If that hypothesis depended on certain single unit isolation, those criteria were stringent; if the test was not critically dependent on single unit isolation, the criteria were relaxed. The conditions and criteria are indicated in our methods.

3. Replication

Describe whether the experimental findings were reliably reproduced.

Our experimental results were reliably reproduced.

4. Randomization

Describe how samples/organisms/participants were allocated into experimental groups.

Our experiments and results do not depend on randomization or group allocation. All animals were wild-type, and treated identically. The only selection criteria were ones of health and age (weight and size).

5. Blinding

Describe whether the investigators were blinded to group allocation during data collection and/or analysis.

No blind experiments were carried out, as per 4 above.

Note: all studies involving animals and/or human research participants must disclose whether blinding and randomization were used.

6. Statistical parameters

For all figures and tables that use statistical methods, confirm that the following items are present in relevant figure legends (or in the Methods section if additional space is needed).

n/a Confirmed

- The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement (animals, litters, cultures, etc.)
- A description of how samples were collected, noting whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
- A statement indicating how many times each experiment was replicated
- The statistical test(s) used and whether they are one- or two-sided (note: only common tests should be described solely by name; more complex techniques should be described in the Methods section)
- A description of any assumptions or corrections, such as an adjustment for multiple comparisons
- The test results (e.g. P values) given as exact values whenever possible and with confidence intervals noted
- A clear description of statistics including central tendency (e.g. median, mean) and variation (e.g. standard deviation, interquartile range)
- Clearly defined error bars

See the web collection on [statistics for biologists](#) for further resources and guidance.

► Software

Policy information about [availability of computer code](#)

7. Software

Describe the software used to analyze the data in this study.

All our code is deposited as indicated in the paper

For manuscripts utilizing custom algorithms or software that are central to the paper but not yet described in the published literature, software must be made available to editors and reviewers upon request. We strongly encourage code deposition in a community repository (e.g. GitHub). [Nature Methods guidance for providing algorithms and software for publication](#) provides further information on this topic.

► Materials and reagents

Policy information about [availability of materials](#)

8. Materials availability

Indicate whether there are restrictions on availability of unique materials or if these materials are only available for distribution by a for-profit company.

NA

9. Antibodies

Describe the antibodies used and how they were validated for use in the system under study (i.e. assay and species).

monoclonal mouse Anti-NeuN antibody, clone A60, MAB377 (Merck Millipore), validated against nissl stains

10. Eukaryotic cell lines

a. State the source of each eukaryotic cell line used.

NA

b. Describe the method of cell line authentication used.

NA

c. Report whether the cell lines were tested for mycoplasma contamination.

NA

d. If any of the cell lines used are listed in the database of commonly misidentified cell lines maintained by [ICLAC](#), provide a scientific rationale for their use.

NA

► Animals and human research participants

Policy information about [studies involving animals](#); when reporting animal research, follow the [ARRIVE guidelines](#)

11. Description of research animals

Provide details on animals and/or animal-derived materials used in the study.

Our experiments were carried out with isolated brains and cortices of turtles (*Trachemys scripta* or *Chrysemys picta*) and mice (C57BL/6J) housed in our state of the art animal facility and with housing and animal permit from the German and Hessian authorities, as indicated in methods.

Policy information about [studies involving human research participants](#)

12. Description of human research participants

Describe the covariate-relevant population characteristics of the human research participants.

NA