

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 [Authors & Referees](#) 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

No software was used.

Data analysis

All analyses were performed using Graphpad Prism 6 statistical software.

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/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

All data generated or analyzed during this study are included in this published article and its supplementary information files. The source data underlying Figs. 1a-e, 2a-f, 3a-e, 3g-i, 4a-c, 5b-e, and Supplementary Figures 1b, 2a-b, 3a-f, 4a-c and 5 are provided as a Source Data file.

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

Life sciences study design

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

| | |
|-----------------|--|
| Sample size | No statistical method were used to pre-determine the sample size. Samples sizes were selected based on previous experience to obtain statistical significance and reproducibility. |
| Data exclusions | The mosquitoes that died before measurement were excluded from the analysis. The criteria was pre-established. |
| Replication | Experimental findings were reliably reproduced in multiple independent experiments as indicated throughout the manuscript. |
| Randomization | All animals in our experiments were randomly allocated into different groups. |
| Blinding | The investigators were not blinded to the allocation during the experiments or to the outcome assessment. The data presented did not require the use of blinding. |

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 |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Antibodies |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> Eukaryotic cell lines |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Palaeontology |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> Animals and other organisms |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> Human research participants |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Clinical data |

Methods

| n/a | Involved in the study |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | <input type="checkbox"/> ChIP-seq |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Flow cytometry |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> MRI-based neuroimaging |

Eukaryotic cell lines

Policy information about [cell lines](#)

| | |
|--|---|
| Cell line source(s) | The Vero cell line was purchased from ATCC |
| Authentication | The Vero cell line has been authenticated using STR by ATCC. |
| Mycoplasma contamination | The Vero cell line was negative for mycoplasma contamination. |
| Commonly misidentified lines (See ICLAC register) | No commonly misidentified cell line was used. |

Animals and other organisms

Policy information about [studies involving animals](#); [ARRIVE guidelines](#) recommended for reporting animal research

| | |
|-------------------------|---|
| Laboratory animals | The AG6 mice (donated from the institute Pasteur of Shanghai, Chiaese Academy of Sciences), 6-8 weeks of age, were used for mouse study. The <i>A.aegypti</i> Rockefeller strain, the <i>A.aegypti</i> Brazil Paraiba strain, the <i>A. albopictus</i> Jiangsu strain and the <i>C.quinquefasciatus</i> Hainan strain were used for mosquito experiments. Both male and female animals were used. |
| Wild animals | The study did not involved wild animals. |
| Field-collected samples | The sewage samples were collected from different cesspit locations and the parameters were shown in supplementary table 2. |
| Ethics oversight | The study protocol was approved by the Institutional Animal care and Use Committee of Tsinghua University. |

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

Human research participants

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

| | |
|----------------------------|--|
| Population characteristics | For human research participants, the detailed information including age, gender, the pH value of urine etc. was listed in Supplementary table 4. |
| Recruitment | Human urine was collected from healthy donors randomly who provided written informed consent by Tsinghua University hospital. |
| Ethics oversight | The protocol was approved by the local ethics committee of Tsinghua University. |

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