nature portfolio

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Reporting Summary

Nature Portfolio 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 Portfolio 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	There's no software was used.
Data analysis	There's no software was used.

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 Portfolio 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 description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

Publicly available data sets (GSE11469158, GSE2590659 and GSE1058860) were analyzed in this study and the data are available via https://www.ncbi.nlm.nih.gov/geo/.

Research involving human participants, their data, or biological material

Policy information about studies with human participants or human data. See also policy information about sex, gender (identity/presentation), and sexual orientation and race, ethnicity and racism.

Reporting on sex and gender	This information has not been collected.
Reporting on race, ethnicity, or other socially relevant groupings	It is inapplicable.
Population characteristics	It is inapplicable.
Recruitment	All of them had undergone elective or emergency cesarean deliveries during Jan.2021 to Aug.2022 at the Department of Gynecology and Obstetrics, the First Affiliated Hospital of Jinan University (Guangzhou, China). The PE diagnosis was based on the criteria issued by the international society for the study of hypertension in pregnancy (ISSHP) in 2018.
Ethics oversight	All processes involving human tissues in this study were approved by the Ethics Committee of the First Affiliated Hospital of Jinan University (approval number: KY-2021-092).

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

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	The choice of sample size is based on a combination of the minimum value required for statistics and the maximum value that can be collected in a realistic situation
Data exclusions	There's no data were excluded from the analyses.
Replication	All attempts at replication were successful.
Randomization	After the rats were numbered, they were randomly grouped according to a random number table.
Blinding	It is inapplicable.

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
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

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

Antibodies

Antibodies used	ZO-1, Caveolin 1, EGFR, pEGFR (Tyr1068), GPX4, ACSL4, SLC7A11, AKT, pAKT, ERK, pERK, β-actin (all the details were listed in the supplementary materials)
Validation	Validation was performed through histological analysis and Western blot.

Eukaryotic cell lines

Policy information about cell lines and Sex and Gender in Research

Cell line source(s)	human umbilical vein endothelial cell (HUVEC) (CRL-1730)
Authentication	STR profile
Mycoplasma contamination	No mycoplasma contamination.
Commonly misidentified lines (See ICLAC register)	No commonly misidentified lines.

Animals and other research organisms

Policy information about studies involving animals; ARRIVE guidelines recommended for reporting animal research, and Sex and Gender in Research

Laboratory animals	Sprague-Dawley rats (6-8 weeks, 180-230g)
Wild animals	The study did not include wild animals.
Reporting on sex	Preeclampsia is a pregnancy-specific complication, so we only analyzed female rats.
Field-collected samples	The study did not involve samples collected from the field.
Ethics oversight	We have complied with all relevant ethical regulations for animal use. And all animal experiments adhered to the Ethical Committee for Animal Experimentation, Jinan University (approval number: IACUC-20221104-01).

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

Plants

Seed stocks	It is inapplicable.
Novel plant genotypes	It is inapplicable.
Authentication	It is inapplicable.