

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

Data analysis

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](#)

Cross-linking data has been deposited in XlinkDB and is publicly available (xlinkdb.gs.washington.edu, network table name = Caudal_iqPIR_TACsham_Bruce). The mass spectrometry proteomics data have been deposited to the ProteomeXchange Consortium via the PRIDE 12 partner repository with the dataset identifiers: PXD027757 and PXD035622. The following publicly available files were included: PDB 5Z62, PDB 3DLX, PDB 3OXO, PDB 1OKC, PDB 6GCI, PDB 2LCK, and Uniprot P48962.

Human research participants

Policy information about [studies involving human research participants and Sex and Gender in Research](#).

Reporting on sex and gender	<input type="text" value="No human research participants were used in this study."/>
Population characteristics	<input type="text" value="No human research participants were used in this study."/>
Recruitment	<input type="text" value="No human research participants were used in this study."/>
Ethics oversight	<input type="text" value="No human research participants were used in this study."/>

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	<input type="text" value="Combined mortality (acute and chronic) was less than 25% and all mice surviving surgery were included in the analysis. Sample size was determined by power analysis based on our surgical previous experiments."/>
Data exclusions	<input type="text" value="No data was excluded from the analysis."/>
Replication	<input type="text" value="All animal experiments were successfully run in technical triplicate unless otherwise specified."/>
Randomization	<input type="text" value="Mice were randomly assigned to TAC and Sham procedures."/>
Blinding	<input type="text" value="The researcher was blind to TAC/Sham operation of each animal until after echocardiogram analysis was performed. During data collection, blinding was not possible because crosslinking was conducted in TAC/Sham pairs."/>

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	Involvement in the study
<input type="checkbox"/>	<input checked="" type="checkbox"/> Antibodies
<input checked="" type="checkbox"/>	<input type="checkbox"/> Eukaryotic cell lines
<input checked="" type="checkbox"/>	<input type="checkbox"/> Palaeontology and archaeology
<input type="checkbox"/>	<input checked="" type="checkbox"/> Animals and other organisms
<input checked="" type="checkbox"/>	<input type="checkbox"/> Clinical data
<input checked="" type="checkbox"/>	<input type="checkbox"/> Dual use research of concern

Methods

n/a	Involvement 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

Antibodies

Antibodies used	<input type="text" value="Anti-NDUA4/NDUFA4 (Cat#ab129752, Lot#GR254771-36), Rabbit IgG HRP-conjugated antibody (Cat#HAF008, Lot#FIN1819101)"/>
Validation	<input type="text" value="Manufacturer states reactivity of Anti-NDUA4/NDUFA4 (ab129752) with mouse and human, suitable for ELISA, ICC/IF, and WB."/>

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	This study utilized 24 wild-type mice, strain C67BL6/NCrI (IMSR_CRL:27). Adult (>10 weeks old, weighing 24-26g) male mice were chosen randomly into experimental groups. Mice were housed at a constant room temperature of 25°C under a 12-hour light/12-hour dark cycle with free access to food and drinking water
Wild animals	The study did not involve wild animals.
Reporting on sex	Female and male mice have different responses to pressure overload. TAC surgery causes a mild and variable phenotype in females. Thus, only male mice were used in this study.
Field-collected samples	The study did not involve field-collected samples.
Ethics oversight	All protocols concerning animal use were approved by the Institutional Animal Care and Use Committee at the University of Washington.

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