

## 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 HiSeq 2000 System, Neon Transfection System, Viento nano, FUSION FX7, Zeiss LSM 900, ViiA7, Nikon Ti2-E, iXonEM+

Data analysis Decipher Bar Code Deconvoluter, GraphPad Prism 6.0, ZEN Blue software, ImageJ, NIS-Elements BR

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](#)

All data generated and analyzed during this study are included in the published article and its supplementary information files or are available from the corresponding authors upon reasonable request..Source data are provided with this paper.

## 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

n/a

Reporting on race, ethnicity, or other socially relevant groupings

n/a

Population characteristics

n/a

Recruitment

n/a

Ethics oversight

n/a

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](https://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

Sample size was determined according to our experience and literature reporting similar experiments.

Data exclusions

No sample was excluded.

Replication

All attempts at replication were successful.

Randomization

Microscopic images of the cells were randomly selected from sample cultures.

Blinding

Researchers were not blinded during experiments and data analysis, as the same person typically performed both tasks.

## 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 type="checkbox"/>	<input checked="" type="checkbox"/> Antibodies
<input type="checkbox"/>	<input checked="" 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
<input checked="" type="checkbox"/>	<input type="checkbox"/> Plants

### 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

## Antibodies

Antibodies used

Anti-KIF11 (HPA010568), anti-β-actin (AC-15), anti-FLAG (F3165), anti-FLAG (F-7425), anti-HA (H9658), anti-NOD2 (HFA054494) were purchased from Sigma-Aldrich.  
Anti-human caspase-1 (sc-514) and anti-KIF11 (sc-374212) were purchased from Santa Cruz Biotechnology.  
Anti- mouse Caspase-1 (ab179515) was purchased from Abcam.

Anti-mouse ASC (AL-177) was purchased from AdipoGen.  
 Anti-mouse IL-1 $\beta$  (BAF401) and anti-human IL-1 $\beta$  (MAB201) were purchased from R&D systems.  
 Anti-HA antibody (MBL-561) and anti- $\beta$ -Tubulin (M175-3) were purchased from MBL.  
 Anti-GM130 (610822) was purchased from BD biosciences.  
 Anti-NLRP4 (NBP1-78979) was purchased from Novus Biologicals. anti-calreticulin (MA5-15382), anti-NLRP3 (PA5-79740), anti-NAIP (PA5-20063), Alexa Fluor 568 goat anti-mouse IgG1 (A-11004), Alexa Fluor 488 goat anti-rabbit IgG (A-11034) were purchased from Thermo Fisher Scientific.

## Validation

All antibodies were validated by manufacturer as indicated on their website.

## Eukaryotic cell lines

Policy information about [cell lines and Sex and Gender in Research](#)

Cell line source(s)	NOMO-1 cells (the Health Science Research Resources Bank, Osaka, Japan), L929 cells (the Cell Resource Center for Biomedical Research, Institute of Development, Aging and Cancer, Tohoku University), 293FT cells (Invitrogen)
Authentication	No authentication procedures were used.
Mycoplasma contamination	All the cell lines are negative for mycoplasma contamination.
Commonly misidentified lines (See <a href="#">ICLAC</a> register)	These cell lines are not on the list of 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	Wild-type C57BL/6 mice were purchased from Japan SLC. Mice were bred and maintained in pathogen-free animal facilities at Kanazawa University.
Wild animals	No wild animals were used in the study.
Reporting on sex	Sex information was not relevant in this study
Field-collected samples	No field-collected samples were used in the study.
Ethics oversight	All animal experiments were approved by the Animal Care and Use Committee of Kanazawa University (AP-143305, AP-173853, AP-184013), and conducted in accordance with the Kanazawa University Animal Experimentation Regulations and the International Guiding Principles for Biomedical Research Involving Animals by the Council for International Organization of Medical Sciences and the international council for Laboratory animal science (December 2012).

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

## Plants

## Seed stocks

n/a

## Novel plant genotypes

n/a

## Authentication

n/a