

Life Sciences Reporting Summary

Nature Research wishes to improve the reproducibility of the work that we publish. This form is intended for publication with all accepted life science papers and provides structure for consistency and transparency in reporting. Every life science submission will use this form; some list items might not apply to an individual manuscript, but all fields must be completed for clarity.

For further information on the points included in this form, see [Reporting Life Sciences Research](#). For further information on Nature Research policies, including our [data availability policy](#), see [Authors & Referees](#) and the [Editorial Policy Checklist](#).

▶ Experimental design

1. Sample size

Describe how sample size was determined.

The high reproducibility of events in *C. elegans* does not require a particularly high number of individual embryos to be analyzed. For each experiment presented in this study, the sample size is equal or higher to sample size observed in most published studies. Since worms are treated individually and a different worm is used to obtain each embryo, each embryo is be considered as an individual experiment.

2. Data exclusions

Describe any data exclusions.

No data were excluded.

3. Replication

Describe whether the experimental findings were reliably reproduced.

For each experiment involving *C. elegans* embryos or adult worms, at least 6 (and up to 20) individual embryos were analyzed, isolated from the same number of individual adult hermaphrodites; and all experiments for temperature calibration of the FLIRT system were done in replicates of 4 (thermochromatic dye) or 7 (mCherry fluorescence) to ensure reliability and reproducibility. All attempts at replication were successful.

4. Randomization

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

Experimental groups were allocated based upon genotype. In experiments with multiple experimental conditions per genotype, embryos were randomly selected for each experimental condition. Both control and ts mutant genotypes were used within a given day of FLIRT experimentation.

5. Blinding

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

The investigators were not blinded to allocation during experiments and outcome assessment due to the nature of the microscopy experiments and the necessity to keep track of the genotype, time of temperature upshift, and the time of IR laser irradiation for each individual time lapse image series, as is consistent within the field.

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.

ImageJ (FIJI), Graphpad Prism, and Microsoft Excel were used for all data analysis.

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.

After publication, all worm strains used in this study will be made available to researchers upon request.

9. Antibodies

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

No antibodies were used in this study.

10. Eukaryotic cell lines

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

No cell lines were used in this study.

b. Describe the method of cell line authentication used.

No cell lines were used in this study.

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

No cell lines were used in this study.

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.

No cell lines were used in this study.

► 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.

This study involved the use of the invertebrate *C. elegans*. No vertebrate animals were used in this study.

12. Description of human research participants

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

No human subjects were used in this study.