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☐ Initial submission ☐ Revised version ☒ Final submission

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.

No sample size was pre-determined. Sample size and number of independent experiments are always clearly stated in the figure legend or in the Methods section.Three to more independent results were used to perform statistical analyses. If less, no statistics were performed from these samples. All raw data required for statistical tests are indicated in supplementary Table 3 (Statistics data source).

2. Data exclusions

Describe any data exclusions.

No data were excluded from analysis.

3. Replication

Describe whether the experimental findings were reliably reproduced.

Experiments in the article were reliably reproduced, replication were described in the figure legends.

4. Randomization

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

No formal randomization techniques was used. No animals and/or human research participants were involved.

5. Blinding

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

Investigators were not blinded to group allocation during data collection and/or analysis.

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.	Microsoft excel 2016 was used to calculate mean, standard deviation and P value. TotalLab 2.0 was used to quantify signal of gel shift assay. The custom Perl and R scripts used in this study are available on request to the corresponding authors.

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.	No unique materials used in the study.

9. Antibodies

Describe the antibodies used and how they were validated for use in the system under study (i.e. assay and species).	Mouse anti-m6A antibody, Supplier: Synaptic Systems, Cat.: #202003, RRID: AB_2279214. Mouse anti-FLAG M2 antibody, Supplier: Sigma-Aldrich, Cat.: F3165, Clone: M2, Lot: SLBN8915V, RRID: AB_259529. Rabbit anti-IGF2BP1 antibody, Supplier: Cell Signaling Technology, Cat.: #8482, Clone: clone D33A2, Lot: 1. Rabbit anti-IGF2BP2 antibody, Supplier: Cell Signaling Technology, Cat.: #14672, Clone: clone D4R2F, Lot: 1. Rabbit anti-MYC antibody, Supplier: Cell Signaling Technology, Cat.: #13987, Clone: clone D3N8F, Lot: 1. Rabbit anti-HuR antibody, Supplier: Cell Signaling Technology, Cat.: #12582, Clone: clone D9W7E, Lot: 1. Rabbit anti-IGF2BP3 antibody, Supplier: Bethyl Laboratories, Cat.: A303-426A, RRID: AB_10951696. Rabbit anti-MATRIN3 antibody, Supplier: Bethyl Laboratories, Cat.: A300-591A-T, RRID: AB_495514. Rabbit anti-DCP1A antibody, Supplier: Bethyl Laboratories, Cat.: A303.590A-T, RRID: AB_11125540. Mouse anti-GAPDH antibody, Supplier: Santa Cruz Biotechnology, Cat.: sc-47724, Clone: 411, RRID: AB_627678. rabbit IgG, Supplier: Millipore, Cat.: #NI01, Lot: D00168753. HRP-conjugated anti-rabbit IgG secondary antibody, Supplier: Santa Cruz Biotechnology, Cat.: sc-2357, Lot: A1817. HRP-conjugated anti-mouse IgG secondary antibody, Supplier: Santa Cruz Biotechnology, Cat.: sc-2055, Lot: E1116. Alexa Fluor 488 anti-rabbit IgG, Supplier: Cell Signaling Technology, Cat.: #4412, Lot: 11. Alexa Fluor 594 anti-mouse IgG, Supplier: Cell Signaling Technology, Cat.: #8890, Lot: 2. Antibodies were validated by the use of negative control and/or positive control (such as knockdown or overexpression) for IGF2BP1, IGF2BP2, IGF2BP3, MYC, HuR and FLAG antibodies. Antibodies were used at 1:1000 dilution for western blot or at 1:200 for immuno staining, while 1 microgram or 10 microgram antibody was used for each co-IP/RIP or CLIP assay.

10. Eukaryotic cell lines

a. State the source of each eukaryotic cell line used.	All cell lines were purchased from the American Type Culture Collection (ATCC).
b. Describe the method of cell line authentication used.	Cell lines were not authenticated by ourselves.
c. Report whether the cell lines were tested for mycoplasma contamination.	All cell lines were tested to be mycoplasma negative.
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 used in this study were found in the database of commonly misidentified cell lines that is maintained by ICLAC and NCBI Biosample.

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.	No animals were used.

Policy information about studies involving human research participants

12. Description of human research participants

Describe the covariate-relevant population characteristics of the human research participants.	The study did not involve human research participants.