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| **Key Resources Table** |
| **Reagent type (species) or resource** | **Designation** | **Source or reference** | **Identifiers** | **Additional information** |
| genetic reagent (D. melanogaster) | *ry506* | Bloomington Drosophila Stock Center(BDSC) | RRID:BDSC\_4405 |  |
| genetic reagent (*D. melanogaster*) | *Oregon-R* | BDSC | BDSC:25211; RRID:BDSC\_25211 |  |
| genetic reagent (*D. melanogaster*) | *N55e11* | BDSC | RRID:BDSC\_28813 |  |
| genetic reagent (D. melanogaster) | *NRE-GFP* | BDSC | RRID:BDSC\_30727 |  |
| genetic reagent (D. melanogaster) | *UAS-NICD* | BDSC | RRID:BDSC\_52008 |  |
| genetic reagent (D. melanogaster) | *10Xstat-GFP* | BDSC | RRID:BDSC\_26198 |  |
| genetic reagent (D. melanogaster) | *tsh-lacZ* | BDSC | RRID:BDSC\_11370 |  |
| genetic reagent (D. melanogaster) | *Alp4-lacZ* | BDSC | RRID:BDSC\_12285 |  |
| genetic reagent (D. melanogaster) | *Diap1-lacZ* | BDSC | RRID:BDSC\_12093 |  |
| genetic reagent (D. melanogaster) | *ex-lacZ* | BDSC | RRID:BDSC\_44248 |  |
| genetic reagent (D. melanogaster) | *UAS-myrRFP* | BDSC | RRID:BDSC\_32222 |  |
| genetic reagent (D. melanogaster) | *UAS-ct* | BDSC | RRID:BDSC\_36496 |  |
| genetic reagent (D. melanogaster) | *ct-RNAi* | BDSC | RRID:BDSC\_29625 |  |
| genetic reagent (D. melanogaster) | *UAS-rpr,hid* | (Zhou et al., 1997) |  |  |
| genetic reagent (D. melanogaster) | *N-RNAi* | BDSC | RRID:BDSC\_35640 |  |
| genetic reagent (D. melanogaster) | *UAS-Rac1.N17* | BDSC | RRID:BDSC\_6292 |  |
| genetic reagent (D. melanogaster) | *FRT19A* | BDSC | RRID:BDSC\_1709 |  |
| genetic reagent (D. melanogaster) | *FRT42D* | BDSC | RRID:BDSC\_1802 |  |
| genetic reagent (D. melanogaster) | *Act5C>stop>lacZ* | BDSC | RRID:BDSC\_6355 |  |
| genetic reagent (D. melanogaster) | *UAS-FLP* | BDSC | RRID:BDSC\_4539 |  |
| genetic reagent (D. melanogaster) | *PucE69-Gal4* | BDSC | RRID:BDSC\_6762 |  |
| genetic reagent (D. melanogaster) | *c507-Gal4* | BDSC | RRID:BDSC\_30840 |  |
| genetic reagent (D. melanogaster) | *Uro-Gal4* | BDSC | RRID:BDSC\_44416 |  |
| genetic reagent (D. melanogaster) | *tsh-Gal4* | BDSC | RRID:BDSC\_3040 |  |
| genetic reagent (D. melanogaster) | *esg-Gal4* | (Micchelli and Perrimon, 2006) |  |  |
| genetic reagent (D. melanogaster) | *cad-Gal4* | BDSC | RRID:BDSC\_3042 |  |
| genetic reagent (D. melanogaster) | *tub-Gal80ts* | BDSC | RRID:BDSC\_7018 |  |
| genetic reagent (D. melanogaster) | *tub-Gal80ts* | BDSC | RRID:BDSC\_7019 |  |
| genetic reagent (D. melanogaster) | *Df31-GFP* | (Buszczak et al., 2007) |  |  |
| genetic reagent (D. melanogaster) | *Pvr-GFP* | Vienna Drosophila Resource Center(VDRC) | RRID:VDRC\_318162 |  |
| genetic reagent (D. melanogaster) | *UAS-upd1* | J. Urban (X. Chen lab, JHU) |  |  |
| genetic reagent (D. melanogaster) | *UAS-rCD2.RFP,UAS-GFPi, FRT40A* | BDSC | RRID:BDSC\_56184 |  |
| genetic reagent (D. melanogaster) | *UAS-rCD8.GFP,UAS-rCD2i,FRT40A* | BDSC | RRID:BDSC\_56185 |  |
| genetic reagent (D. melanogaster) | *42D-MARCM* | (Fox and Spradling, 2009) |  | UAS-cd8GFP hsFlp; FRT*42D tub-Gal80; tub-Gal4/TM6B, Tb* |
| antibody | anti-Cut (mouse monoclonal) | Developemental Studies Hybridoma Bank (DSHB) | Cat#2B10; RRID: [AB\_528186](http://antibodyregistry.org/AB_528186) | IF(1:20) |
| antibody | anti-Dl (mouse monoclonal) | DSHB | Cat#C594.9B; RRID: [AB\_528194](http://antibodyregistry.org/AB_528186) | IF(1:10) |
| antibody | anti-NECD (mouse monoclonal) | DSHB | Cat#C458.2H; RRID: [AB\_528408](http://antibodyregistry.org/AB_528186) | IF(1:10) |
| antibody | anti-β-Gal (mouse monoclonal) | Promega | Cat#Z3781; AB\_430877 | IF(1:1000) |
| antibody | anti-β-Gal (rabbit polyclonal) | Cappel | Cat#55976; AB\_2313707 | IF(1:2000) |
| antibody | anti-GFP (rabbit polyclonal) | ThermoFisherScientific | Cat# A-11122; RRID: AB\_221569 | IF(1:2000) |
| antibody | anti-PH3 (mouse polyclonal) | Cell Signaling Technology | Cat# 9706, RRID:AB\_331748 | IF(1:500) |
| antibody | anti-RFP (rabit polyclonal) | Rockland | Cat# 600401379, RRID: AB\_2209751 | IF(1:2000) |
| antibody | anti-dpErK (mouse polyclonal) | Sigma-Aldrich | Cat# M9692, RRID:AB\_260729 | IF(1:500) |
| antibody | Alexa 488 goat anti-Mouse | ThermoFisherScientific | Cat#: A11001; RRID: AB\_2534069 | IF(1:300) |
| antibody | Alexa 568 goat anti-Mouse | ThermoFisherScientific | Cat#: A11004; RRID: AB\_2534072 | IF(1:300) |
| antibody | Alexa 488 goat anti-Rabbit | ThermoFisherScientific | Cat#: A11034; RRID: AB\_2576271 | IF(1:300) |
| antibody | Alexa 568 goat anti-Rabbit | ThermoFisherScientific | Cat#: A11041; RRID: AB\_2534098 | IF(1:300) |
| commercial assay or kit | Click-iT™ EdU Cell Proliferation Kit for Imaging, Alexa Fluor™ 488 dye | ThermoFisher | Cat#C10337 |   |
| commercial assay or kit | TruSeq RNA Library Prep Kit v2 | illumina | RS-122-2001 |   |
| chemical compound, drug | Allopurinol | Sigma Aldrich | Cat#A8003 |   |
| software, algorithm | IMARIS v9.2.1 | Bitplane | RRID:SCR\_007370 |   |
| software, algorithm | Fiji | NIH | RRID:SCR\_002285 |   |
| software, algorithm | DESeq2 | (Love et al., 2014) | RRID:SCR\_015687 |   |
| software, algorithm | HISAT2 v2.1.0 | (Pertea et al., 2016) | RRID:SCR\_015530 |   |
| software, algorithm | Seurat  | (Stuart et al., 2019) | RRID:SCR\_016341 |   |
| software, algorithm | Cell Ranger | 10X genomics | RRID:SCR\_017344 |   |