**Supplementary File 5. Strain list.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Strain Name** | **Mutant background** | **Array name** | **DNA on array** | **Reference** | **Footnote** |
| OH9382 | *flp-21(ok889)* |  |  | (Consortium 2012) |  |
| LH23 | *lad-2(hd31)* |  |  | (Wang *et al.* 2008) |  |
| VC40759 | *ncam-1(gk798240)* |  |  | (Consortium 2012) |  |
| VC228 | *nlg-1(ok259)* |  |  | (Consortium 2012) |  |
| OH12406 | *ntr-1(tm2765)* |  |  |  |  |
| OH12367 | *ntr-2(tm2243)* |  |  |  |  |
| VC40861 | *rig-1(gk852686)* |  |  | (Consortium 2012) |  |
| RB1364 | *rig-1(ok1540)* |  |  | (Consortium 2012) |  |
| RB1712 | *rig-3(ok2156)* |  |  | (Consortium 2012) |  |
| VH823 | *rig-5(hd48)* |  |  | (Schwarz *et al.* 2009) |  |
| VC884 | *rig-6(gk376)* |  |  | (Consortium 2012) |  |
| VC30212 | *rig-6(gk438569)* |  |  | (Consortium 2012) |  |
| VC40404 | *rig-6(gk621278)* |  |  | (Consortium 2012) |  |
| VC1125 | *rig-6(ok1589)* |  |  | (Consortium 2012) |  |
| CB151 | *unc-3(e151)* |  |  | (Brenner 1974) |  |
| OH13990 | *unc-3(ot839[unc-3::gfp])* |  |  |  |  |
| CB271 | *unc-40(e271)* |  |  | (Brenner 1974) |  |
| CB270 | *unc-42(e270)* |  |  | (Brenner 1974) |  |
| CB419 | *unc-42(e419)* |  |  | (Brenner 1974) |  |
| OH14566 | *unc-42(ot868[unc-42::tagrfp::3Xflag])* |  |  | this work | 9 |
| OH16111 | *unc-42(ot986[unc-42::gfp])* |  |  | this work | 10 |
| NW434 | *unc-6(ev400)* |  |  | (Wadsworth *et al.* 1996) |  |
| CB644 | *unc-62(e644)* |  |  | (Brenner 1974) |  |
| OH13430 | *ceh-20(ok541)* | *muEx261; otIs353* | *muEx261[ceh-20::GFP at C terminus + odr-1::RFP]; otIs353[ric-4fosmid::sl2::nls::yfp::h2b; pha-1(+)]* | (Consortium 2012) |  |
| CB5 | *unc-7(e5)* |  |  | (Brenner 1974) |  |
| CX6161 | *inx-19(ky634)* |  |  | (Chuang *et al.* 2007) |  |
| RB1896 | *inx-18(ok2454)* |  |  | (Voelker *et al.* 2019) |  |
| OH13525 | *inx-6(ot804[inx-6::SL2::NLS::yfp::H2B])* |  |  | (Bhattacharya *et al.* 2019) |  |
| OH16617 |  | *otIs779* | *unc-7fosmid::sl2::nls::yfp::h2b; pha-1(+); myo-2::bfp* | this work |  |
| OH15225 | *pha-1(e2123)* | *otEx7075* | *inx-18afosmid::sl2::nls::yfp::h2b; pha-1(+); myo-2::bfp* | (Bhattacharya *et al.* 2019) |  |
| OH16524 |  | *otIs769* | *inx-19fosmid::sl2::nls::yfp::h2b; pha-1(+); myo-2::bfp* | this work |  |
| CX15758 |  | *kyIs631* | *inx-1p::HisCl1::sl2::gfp* | * (Jin *et al.* 2016) |  |
| NC782 |  | *wdEx290* | *acr-15prom::gfp; unc-119(+)* |  |  |
| OH12318 |  | *otIs491* | *acr-16prom::gfp; rol-6(su1006)* |  |  |
| CZ631 |  | *juIs14* | *acr-2prom::gfp; lin-15(+)* | (Hallam *et al.* 2000) |  |
| OH8908 |  | *otIs251* | *cat-2prom::gfp; rgef-1prom::dsred* |  |  |
| LE311 |  | *lqIs4* | *ceh-10prom::gfp, lin-15(+)* |  |  |
| PD4595 |  | *ccIs4595* | *ceh-24prom::gfp; rol-6(su1006)* |  |  |
| OH16206 | *pha-1(e2123)* | *otEx7442* | *cfi-1prom::gfp; des-2prom::tagrfp +pha-1(+)* | this work | 4 |
| OH16205 | *pha-1(e2123)* | *otEx7441* | *cfi-1prom::gfp; des-2prom::tagrfp; pha-1(+)* | this work | 4 |
| OH16207 | *pha-1(e2123)* | *otEx7443* | *cfi-1prom::gfp; des-2prom::tagrfp; pha-1(+)* | this work | 4 |
| OH12655 |  | *otIs544* | *cho-1fosmid::sl2::nls::mchopti::h2b; pha-1(+)* | (Pereira *et al.* 2015) |  |
| OH10688 |  | *otIs354* | *cho-1fosmid::sl2::nls::yfp::h2b; pha-1(+)* | (Pereira *et al.* 2015) |  |
| OH12496 |  | *otIs518* | *eat-4fosmid ::sl2::nls::mchopti::h2b; pha-1(+)* | (Serrano-Saiz *et al.* 2013) |  |
| OH11124 |  | *otIs388* | *eat-4fosmid::sl2::nls::yfp::h2b; pha-1(+)* | (Serrano-Saiz *et al.* 2013) |  |
| NY2082 |  | *ynIs82* | *flp-12prom::gfp* |  |  |
| OH15621 |  | *otIs704* | *flp-18prom::tagrfp* | this work | 5 |
| OH15622 |  | *otIs705* | *flp-18prom::tagrfp* | this work | 5 |
| NY2054 | *him-5(e1490)* | *ynIs54* | *flp-20prom::gfp* |  |  |
| NY2066 | *him-5(e1490)* | *ynIs66* | *flp-7prom::gfp* | (Kim and Li 2004) |  |
| OH15322 |  | *otIs675* | *flp-7prom::rab-3::gfp::unc-10\_3'utr; unc-122prom::gfp* | this work | 2 |
| OH15324 |  | *otIs676* | *flp-7prom::rab-3::gfp::unc-10\_3'utr; unc-122prom::gfp* | this work | 2 |
| OH15325 |  | *otIs677* | *flp-7prom::rab-3::gfp::unc-10\_3'utr; unc-122prom::gfp* | this work | 2 |
| OH15328 |  | *otIs679* | *flp-7prom::rab-3::gfp::unc-10\_3'utr; unc-122prom::gfp* | this work | 2 |
| NC1750 |  | *hdIs32; gvEx173* | *glr-1prom::dsred2; opt-3::gfp + rol-6(su1006)* |  |  |
| OH12052 |  | *otIs476* | *glr-4prom::tagrfp; pha-1(+)* | (Stefanakis *et al.* 2015) |  |
| OH13615 | *pha-1(e2123)* | *otEx6320* | *glr-5fosmid::sl2::nls::yfp::h2b; pha-1(+)* |  |  |
| UL1692 | *unc-119(ed3)* | *leEx1692* | *hlh-34prom::gfp; unc-119(+)* |  | 1 |
| PT2660 |  | *myIs13* | *klp-6prom::gfp* | (Schroeder *et al.* 2013) |  |
| LH247 | *lad-2(tm3056)* | *otEx331* | *lad-2p::GFP + pha-1(+)* | (Wang *et al.* 2008) |  |
| QW84 |  | *zfIs4* | *lgc-55prom::mcherry* | (Pirri *et al.* 2009) |  |
| VH1226 | *pha-1(e2123)* | *hdEx335* | *ncam-1prom::yfp; pha-1(+)* | (Schwarz *et al.* 2009) |  |
| OH15495 |  | *otIs696* | *NeuroPAL* | (Yemini et al., submitted) |  |
| OJ1031 |  | *vjIs47* | *nlg-1prom::gfp* |  |  |
| HA299 | *lin-15B&lin-15A(n765)* | *rtEx222* | *nlp-6prom::gfp; lin-15(+)* |  |  |
| OH15214 |  | *otEx7064* | *nmr-1prom::unc-42::gfp; ttx-3prom::mcherry* | this work | 7 |
| OH15216 |  | *otEx7066* | *nmr-1prom::unc-42::gfp; ttx-3prom::mcherry* | this work | 7 |
| OH15218 |  | *otEx7068* | *nmr-1prom::unc-42::gfp; ttx-3prom::mcherry* | this work | 7 |
| OH15219 |  | *otEx7069* | *nmr-1prom::unc-6::sl2::nls::yfp::h2b; ttx-3prom::mcherry* | this work | 8 |
| OH15220 |  | *otEx7070* | *nmr-1prom::unc-6::sl2::nls::yfp::h2b; ttx-3prom::mcherry* | this work | 8 |
| OH15221 |  | *otEx7071* | *nmr-1prom::unc-6::sl2::nls::yfp::h2b; ttx-3prom::mcherry* | this work | 8 |
| AQ2087 |  |  | *npr-2prom::rfp* |  |  |
| AX1792 |  | *dbEx721* | *npr-4prom::mcherry; unc-122prom::gfp* | (Cohen *et al.* 2009) |  |
| OH15369 |  | *otIs680* | *npr-9prom::rab-3::gfp::unc-10\_3'utr; unc-122prom::gfp* | this work | 2 |
| OH15370 |  | *otIs681* | *npr-9prom::rab-3::gfp::unc-10\_3'utr; unc-122prom::gfp* | this work | 2 |
| OH12467 |  | *otEx5646* | *ntc-1fosmid::sl2::nls::mchopti::h2b; rol-6(su1006)* |  |  |
| OH12750 |  | *otIs547* | *ntr-1prom::gfp; elt-2prom::mcherry* |  |  |
| OH12486 |  | *otEx5659* | *ntr-2fosmid::sl2::nls::yfp::h2b; rol-6(su1006)* |  |  |
| LX990 | *lin-15B&lin-15A(n765)* | *vsEx494* | *ocr-2prom::gfp::ocr-2\_3'utr; lin-15(+)* |  |  |
| CX3260 |  | *kyIs37* | *odr-10prom::gfp, lin-15(+)* | (Sengupta *et al.* 1996) |  |
| OH11809 |  | *otIs450* | *oig-1fosmid::sl2::gfp; rol-6(su1006)* | (Howell *et al.* 2015) |  |
| HA0003 |  | *nuIs11* | *osm-10prom::gfp; lin-15(+)* | (Hart *et al.* 1999) |  |
| PY6100 |  | *oyIs59* | *osm-6prom::osm-6::gfp* |  |  |
| OH14456 | *ot845[bnc-1::mneongreen::3xflag::aid])* | *otEx6773* | *pdf-1prom::nls::mchopti::h2b; myo-2prom::mcherry* |  |  |
| LSC87 |  | *lstEx6* | *pdf-2prom::gfp; myo-3prom::mcherry* | (Janssen *et al.* 2009) |  |
| PT2351 | *him-5(e1490)* | *myEx741* | *pdfr-1prom::nls::rfp; unc-122prom::gfp* | (Barrios *et al.* 2012) |  |
| GD387 |  | *ivIs26* | *phat-1prom::wcherry; glr-2prom::gfp; rol-6(su1006)* |  |  |
| OH10689 |  | *otIs355* | *rab-3prom::nls::tagrfp* | (Stefanakis *et al.* 2015) |  |
| VH1432 |  |  | *rig-1prom::yfp* | (Schwarz *et al.* 2009) |  |
| OH4326 | *pha-1(e2123)* | *otEx239* | *rig-3prom::GFP; pha-1(+)* | (Aurelio *et al.* 2002) |  |
| OH12831 | *pha-1(e2123)* | *otEx5883* | *rig-5prom::rig-5::sl2::gfp; pha-1(+)* | (Vidal *et al.* 2015) |  |
| VH1223 | *pha-1(e2123)* | *hdEx332* | *rig-5prom::yfp; pha-1(+)* | (Schwarz *et al.* 2009) |  |
| VH1224 | *pha-1(e2123)* | *hdEx333* | *rig-6prom::yfp; pha-1(+)* | (Schwarz *et al.* 2009) |  |
| OH1422 |  | *otIs138* | *ser-2prom::gfp; rol-6(su1006)* |  |  |
| OH15625 |  | *otIs708* | *sra-11prom::wrmscarlet; inx-6prom::tagrfp* | this work | 6 |
| FG802 |  |  | *srd-10prom::gfp* |  |  |
| OH15173 |  | *otIs663* | *srd-10prom::gfp* | this work | 11 |
| OH15385 |  | *otIs684* | *srd-10prom::rab-3::gfp::unc-10\_3'utr; unc-122prom::gfp* | this work | 2 |
| BC15959 | *dpy-5(e907)* | *sEx15959* | *srh-15prom::gfp; dpy-5(+)* | (McKay and Johnsen 2004) |  |
| CX3553 |  | *kyIs104* | *str-1prom::mcherry* | (Troemel *et al.* 1997) |  |
| CX3596 |  | *kyIs128* | *str-3prom::gfp* |  |  |
| OH14522 |  | *zfIs10* | *tdc-1prom::mcherry* | this work |  |
| OH13083 |  | *otIs576* | *unc-17fosmid::gfp; lin-44prom::yfp* | (Pereira *et al.* 2015) |  |
| OP173 |  | *wgIs173* | *unc-42* *WRM0636dG10fosmid::gfp* |  |  |
| OH14431 |  | *otIs638* | *unc-6fosmid::nls::yfp::h2b; pha-1(+); ttx-3prom::mcherry* | (Weinberg *et al.* 2018) |  |
| AQ3955 |  | *ljEx1067* | *WRM0616cB05 npr-11fosmid::sl2::gfp* |  |  |
| AX7054 |  | *dbEx1027* | *WRM0634bG04 frpr-8fosmid::SL2::GFP; unc-122prom::tagrfp* |  |  |
| OH15672 | *unc-42(e419)* | *otEx7280* | *WRM0636dG10 (unc-42 fosmid); unc-122prom::gfp* | this work | 3 |
| OH15764 | *unc-42(e419)* | *otEx7324* | *WRM0636dG10 (unc-42 fosmid); unc-122prom::gfp* | this work | 3 |
| OH15767 | *unc-42(e419)* | *otEx7325* | *WRM0636dG10 (unc-42 fosmid); unc-122prom::gfp* | this work | 3 |
| OH16894 | *hlh-34(syb2697); otIs696* | *otIs696* | *NeuroPAL* | This work | 12 |
| OH16894 | *hlh-34(syb2697);* lstEx6[pdf-2::GFP] | lstEx6 | *pdf-2prom::GFP* | This work | 12 |

Footnotes:

1: As per cell identification with NeuroPAL, this reporter is expressed in AVH and was previously misidentified to be expressed in AVJ (Cunningham et al., 2012).

2: To generate the *rab-3* transgenic strains *otIs684, otIs681, otIs680, otIs676, otIs677, otIs679,* and *otIs675*, the 1.2kb *srd-10prom* (*otIs684*) or the 1.7kb *nrp-9prom* (*otIs681, otIs680*) or the 234bp *flp-7prom* (*otIs676, otIs677, otIs679, otIs675*) was cloned to replace the *unc-30prom* in a plasmid kindly provided by John Kerk containing the *unc-30prom*, *gfp*, the *rab-3* cDNA, and the *unc-10 3’utr*. These plasmids were injected at 50ng/ul along with 50ng/ul of the *unc-122prom::gfp* injection marker. The extrachromosomal arrays derived from these injections were then gamma irradiated for integration.

3: To create these strains, the WRM0636dG10 fosmid was linearized with Not-I and injected into *unc-42(e419)* at a concentration of 15ng/ul, along with the *unc-122prom::gfp* injection marker at a concentration of 5ng/ul and 100ng/ul of PvuII-digested bacterial genomic DNA.

4: To create these strains, the 2.2kb *cfi-1prom* was cloned by deletion of the pSH405 plasmid (Shaham and Bargmann 2002) to keep only part of the 2nd intron. For the 448bp *des-2prom*, the unc-86 binding site was removed and cloned into pPD95.75 containing *tagrfp*. These plasmids were injected into *pha-1(e2123)* along with a *pha-1(+)* rescuing array. The *cfi-1prom* plasmid was injected at 35ng/ul, the *des-2prom* plasmid was injected at 25ng/ul, and the *pha-1(+)* rescuing array was injected at 50ng/ul.

5: To create these strains, the 3.1kb *flp-18prom* was cloned from MVC12 (Park *et al.* 2011) into pPD95.75 containing *tagrfp*. This plasmid was injected at 50ng/ul. The extrachromosomal arrays derived from these injections were then gamma irradiated for integration.

6: To create this strain, the 2.7kb *sra-11prom* was cloned into pPD95.75 containing *wrmscarlet*. This plasmid was injected at 50ng/ul along with 4ng/ul of the inx-6prom::tagFRP coinjection marker (Bhattacharya and Hobert 2019). The extrachromosomal arrays derived from these injections were then gamma irradiated for integration.

7: To create these *unc-42* rescuing strains, pFG263 (a plasmid containing a 1.2kb *nmr-1prom*, *gfp*, and the *unc-42* cDNA in pPD49.26 (from the Fire vector kit)) was injected at 50ng/ul along with 50ng/ul of the *ttx-3prom::mcherry* injection marker.

8: To create these strains, the 1.2kb *nmr-1prom* was cloned to replace the *inx-18prom* in pPW3 (a plasmid kindly provided by Peter Weinberg containing an *inx-18prom*, the *unc-6* cDNA, and *nls::yfp::h2b* in pPD95.75 (from the Fire vector kit)). This plasmid was then injected at a concentration of 50ng/ul along with 50ng/ul of the *ttx-3prom::mcherry* injection marker.

9: *ot868 [unc-42::tagrfp::3Xflag]* was engineered using the procedure described in (Dickinson *et al.* 2015). The fluorescent tag was added to the C-terminus of UNC-42 separated by a short linker. The plasmid serving as a template for homologous recombination was cloned using Gibson and included 700 bp homology arms. Recombinants were verified by DNA sequencing.

10: *ot986 [unc-42::gfp]* was engineered using the procedure described in (Dokshin *et al.* 2018). The fluorescent tag was added to the C-terminus of UNC-42 separated by a short linker. The asymmetric dsDNA sequence serving as a template for homologous recombination was made by PCR and included 120bp homology arms. Recombinants were verified by DNA sequencing.

11: *otIs663 [srd-10prom::gfp]* was made by integration of *Ex [srd-10prom::GFP]* generated in the Ferkey lab, by gamma irradiation.

12: *hlh-34(syb2697)* is a 410bp deletion in the *hlh-34* locus created byCRISPR/Cas9 genome editing.

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