

**Table S1. Strains used in this manuscript:**

Strain	Genotype
N2	wild type
CZ27358	<i>jph-1(ju1683) I</i>
CZ27360	<i>jph-1(ju1684) I</i>
CZ28073	<i>jph-1(ju1683) I; juEx3390[jph-1 fosmid WRM0622aB02]</i>
CZ28260	<i>jph-1(ju1683) I; juEx3392[jph-1 fosmid WRM0623aF07]</i>
CZ27162	<i>juEx8014[Pjph-1-GFP]</i>
CZ27161	<i>juEx8013[Pjph-1-GFP]</i>
CZ28024	<i>jph-1(ju1683) I; juEx7999[Pjph-1-GFP::JPH-1A]</i>
CZ27777	<i>jph-1(ju1683) I; juSi387[Pjph-1-GFP::JPH-1A] IV</i>
CZ27603	<i>jph-1(ju1683) I; juEx8037[Pjph-1-GFP::JPH-1B]</i>
CZ27606	<i>jph-1(ju1683) I; juEx8038[Pjph-1-GFP::JPH-1B]</i>
CZ27364	<i>juSi387[Pjph-1-GFP::JPH-1A] IV</i>
CZ28264	<i>nuTi144 [Pmyo-3 GFP 1-10 G418] I; unc-68(nu664) V; juEx8103[Pjph-1-mKate2::JPH-1A]</i>
CZ28263	<i>nuTi144 [Pmyo-3 GFP 1-10 G418] I; egl-19(nu674) IV; juEx8103[Pjph-1-mKate2::JPH-1A]</i>
CZ27404	<i>juSi387[Pjph-1-GFP::JPH-1A] IV; juls540[Pmec-4-mKate2::ESYT-2] X</i>
CZ27569	<i>juEx8038[Pjph-1-GFP::JPH-1B]</i>
CZ24806	<i>eat-4(ky5)</i>
CZ27782	<i>jph-1(ju1683) I; juEx8041[Pmyo-2-GFP::JPH-1A]</i>
CZ28120	<i>jph-1(ju1683) I; juEx8022[Pmyo-3-GFP::JPH-1A]</i>
CZ28121	<i>jph-1(ju1683) I; juEx8023[Pmyo-3-GFP::JPH-1A]</i>
CZ28051	<i>jph-1(ju1683) I; juSi389(Prab-3-GFP::JPH-1A) IV</i>
CZ13170	<i>jph-1(ok2823) I</i>
CZ13990	<i>jph-1(ok2823) I; juEx3390[jph-1 fosmid WRM0622aB02]</i>

CZ27483	<i>jph-1(ok2823) I; juEx3392[jph-1 fosmid WRM0623aF07]</i>
CZ10969	<i>muls32(Pmec-7-GFP) II</i>
CZ26391	<i>jph-1(ok2823) I; muls32[Pmec-7-GFP] II</i>
CZ27359	<i>jph-1(ju1683) I; muls32[Pmec-7-GFP] II</i>
CZ27778	<i>jph-1(ju1683) I; muls32[Pmec-7-GFP] II; juSi387[Pjph-1-GFP::JPH-1A]IV</i>
CZ27783	<i>jph-1(ju1683) I; muls32[Pmec-7-GFP] II; juEx8041[Pmyo-2-GFP::JPH-1A]</i>
CZ27910	<i>jph-1(ju1683) I; muls32[Pmec-7-GFP] II; juSi388[Pmec-4-GFP::JPH-1A]IV</i>
OD2984	<i>ltSi953[Pmec-18-Degron-SL2-mKate2; cb-unc-119(+)]II; unc-119(ed3)III</i>
CZ27842	<i>jph-1(ju1683) I; ltSi953[Pmec-18-Degron-SL2-mKate2; cb-unc-119(+)] II; juSi387[Pjph-1-GFP::JPH-1A] IV; unc-119(ed3)?III</i>
CZ27361	<i>jph-1(ju1684) I; muls32[Pmec-7-GFP] II</i>
CZ27536	<i>juEx8035[Pjph-1-GFP::JPH-1(ok2823)]</i>
CZ28262	<i>nuls321[Punc-17-mCherry]; juEx7999[Pjph-1-GFP::JPH-1A]</i>
CZ27875	<i>juSi388[Pmec-4-GFP::JPH-1A] IV</i>
CZ28377	<i>unc-17(ot907) IV; juEx8026[Prab-3-GFP::JPH-1A]</i>
CZ28392	<i>unc-17(ot907) IV; juEx8113[Prgef-1-GFP::ESYT-2]</i>
CZ26322	<i>esyt-2(ju1409) III</i>
CZ28238	<i>esyt-2(ju1409) III; juEx7581 [esyt-2 gDNA]</i>
CZ28390	<i>juEx8112[Prgef-1-GFP::ESYT-2]</i>
CZ28391	<i>esyt-2(ju1409) III; juEx8112[Prgef-1-GFP::ESYT-2]</i>
CZ28070	<i>jph-1(ju1683) I; esyt-2(ju1409) III</i>
CZ26389	<i>esyt-2(ju1408) III</i>
CZ28241	<i>jph-1(ju1684) I; esyt-2(ju1408) III</i>
CZ28282	<i>jph-1(ju1683) I; esyt-2(ju1409) III; juEx7581 [esyt-2 gDNA]</i>
CB540	<i>unc-68(e540) V</i>
CZ28026	<i>jph-1(ju1683) I; unc-68(e540)V; juEx7999[Pjph-1-GFP::JPH-1A]</i>

CZ26691	<i>egl-19(ad1006lf) IV</i>
DA695	<i>egl-19(ad695gf) IV</i>
CZ27905	<i>jph-1(ju1683) I; egl-19(ad695gf) IV</i>
CB55	<i>unc-2(e55) X</i>
CZ28054	<i>jph-1(ju1683) I; unc-2(e55) X; juEx7999[Pjph-1-GFP::JPH-1A]</i>
QW47	<i>unc-2(zf35gf) X</i>
CZ27903	<i>jph-1(ju1683) I; unc-2(zf35gf) X</i>
CZ28025	<i>unc-68(e540) V; juEx7999[Pjph-1-GFP::JPH-1A]</i>
CZ28053	<i>unc-2(e55) X; juEx7999[Pjph-1-GFP::JPH-1A]</i>
CZ28055	<i>esy-2(ju1409) III; juSi387[Pjph-1-GFP::JPH-1A] IV</i>
KP10704	<i>egl-19(nu674) IV; unc-68(nu628) V; nuTi456[Ppat-10-mCherry1-10::SL2::GFP1-10] III</i>
KP10705	<i>egl-19(nu674) IV; unc-68(nu628) V; nuTi456[Ppat-10-mCherry1-10::SL2::GFP1-10] III; jph-1(ju1683); juEx8041[Pmyo-2-GFP::JPH-1A]</i>

**Table S2. Plasmid used in this manuscript:**

<b>Plasmid name</b>	<b>Description</b>
pCZGY3516	<i>Pjph-1</i> -GFP:: <i>JPH-1A</i>
pCZGY3519	<i>Pjph-1</i> -GFP:: <i>JPH-1A</i> with homology arms for CRISPR/Cas9 knock-in
pCZGY3525	<i>Pjph-1</i> -GFP:: <i>JPH-1B</i>
pCZGY3344	<i>Pmec-4</i> -mKate2:: <i>ESYT-2</i>
pCZGY3518	<i>Pjph-1</i> -GFP
pCZGY3523	<i>Pmyo-2</i> -GFP:: <i>JPH-1A</i>
pCZGY3522	<i>Prab-3</i> -GFP:: <i>JPH-1A</i> with homology arms for CRISPR/Cas9 knock-in
pCZGY3535	<i>Pmyo-3</i> -GFP:: <i>JPH-1A</i>
pCZGY3520	<i>Pmec-4</i> -GFP:: <i>JPH-1A</i> with homology arms for CRISPR/Cas9 knock-in
pCZGY2750	<i>Peft-3</i> :Cas9 + cxTi10882 sgRNA
pCFJ90	<i>Pmyo-2</i> -mCherry (Frøkjær-Jensen et al. 2008)
pCFJ104	<i>Pmyo-3</i> -mCherry (Frøkjær-Jensen et al. 2008)
pCZGY3529	<i>Pjph-1</i> -GFP:: <i>JPH-1(ok2823)</i>
WRM0622aB02	Fosmid containing entire genomic DNA of <i>jph-1</i>
WRM0623aF07	Fosmid containing entire genomic DNA of <i>jph-1</i>
pKP3315	<i>Pmyo-3</i> split-GFP(1-10) miniMOS G418
pKP4522	<i>Ppat-10</i> split-mCherry(1-10)::SL2::split-GFP(1-10) miniMOS G418
pKP3318	<i>egl-19</i> exon 1, gRNA 5'-TTACCTGACATGATGGACAC-3'
pKP3319	<i>egl-19</i> exon 1, 7x split-GFP(FP11) with homology arms for CRISPR/Cas9 knock-in
pKP3320	<i>unc-68A</i> exon 31 gRNA 5'-GATGCTGCAGCCACGGGCGG-3'
pKP3321	<i>unc-68A</i> exon 31, 7x split-GFP(FP11) with 1kb homology arms for CRISPR/Cas9 knock-in
pKP4523	<i>unc-68a</i> exon 31, 4x split-mCherry(FP11) with 1kb homology arms for CRISPR/Cas9 knock-in

pGW28	<i>unc-58</i> gRNA co-CRISPR 5'-ATCCACGCACATGGTCACTA-3' (Arribere et al. 2014)
pDD162	<i>Peft-3</i> -CAS9 (Dickinson et al. 2013)

**Table S3. Transgenes used in this manuscript:**

Transgene name and brief description	Injected DNA	Injected conc. (ng/ $\mu$ l)	Co-injection marker and conc.	Source
<i>juEx3390[jph-1 fosmid WRM0622aB02]</i>	fosmid WRM0622aB02	10	<i>Pttx-3</i> -RFP (30 ng/ $\mu$ l)	This manuscript
<i>juEx3392[jph-1 fosmid WRM0623aF07]</i>	fosmid WRM0623aF07	10	<i>Pttx-3</i> -RFP (30 ng/ $\mu$ l)	This manuscript
<i>juEx8014[Pjph-1-GFP]</i>	pCZGY3518	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juEx8013[Pjph-1-GFP]</i>	pCZGY3518	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juEx7999[Pjph-1-GFP::JPH-1A]</i>	pCZGY3516	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juSi387[Pjph-1-GFP::JPH-1A]</i>	pCZGY3519	2.5		This manuscript
<i>juEx8037[Pjph-1-GFP::JPH-1B]</i>	pCZGY3525	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juEx8038[Pjph-1-GFP::JPH-1B]</i>	pCZGY3525	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juls540[Pmec-4-mKate2::ESYT-2]</i>				Kim <i>et al.</i> , 2018
<i>juEx8041[Pmyo-2-GFP::JPH-1A]</i>	pCZGY3523	0.125	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juEx8022[Pmyo-3-GFP::JPH-1A]</i>	pCZGY3535	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juEx8023[Pmyo-3-GFP::JPH-1A]</i>	pCZGY3535	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript
<i>juSi389[Prab-3-GFP::JPH-1A]</i>	pCZGY3522	10		This manuscript
<i>juSi388[Pmec-4-GFP::JPH-1A]</i>	pCZGY3520	2.5		This manuscript
<i>ItSi953[pOD2087/pSW408]</i>				Wang <i>et al.</i> , 2017
<i>juEx8035[Pjph-1-GFP::JPH-1(ok2823)]</i>	pCZGY3529	2.5	<i>Punc-122</i> -RFP (50 ng/ $\mu$ l)	This manuscript

<i>nuTi144[Pmyo-3-GFP1-10]</i>	pKP3315	10		This manuscript
<i>nuTi456[Ppat-10-mCherry1-10::SL2::GFP1-10]</i>	pKP4522	10		This manuscript

**Table S4. Primers used in this manuscript:**

<b>a. Primers for cloning</b>		
<b>Name</b>	<b>Sequence (5' to 3')</b>	<b>Purpose</b>
YJ12558	gacgtaggtgtgtcagcag	5' flanking primer to amplify <i>jph-1</i> cDNA
YJ12559	cctgaggagaagtgtgtctg	3' flanking primer to amplify <i>jph-1</i> cDNA
YJ12560	atgaatggaggcagatttgac	Forward primer to amplify <i>jph-1</i> from start codon
YJ12561	ctacgaagaagacttcttcttcttc	Reverse primer to amplify <i>jph-1</i> isoform A to stop codon
YJ12562	ctaatatgtgagggtgtgtaccg	Reverse primer to amplify <i>jph-1</i> isoform B to stop codon
YJ12563	tgttctgccattaccagcccg	Forward primer to amplify 4.5 kb <i>jph-1</i> promoter
YJ12564	ttccatttgccgtactgctg	Reverse primer to amplify 4.5 kb <i>jph-1</i> promoter
AF-JA-76	atTTTgtgtataaaatagccgagttaggaacaaa TTTTctttcaggtttctcagtagtgaccatgtgcgtg gatcttgcgtccacacatctcaaggcgtactt	<i>unc-58(gf)</i> co-CRISPR repair oligo (Arribere et al. 2014)

<b>b. Genotyping primer sets</b>			
<b>Name</b>	<b>Sequence</b>	<b>Purpose</b>	<b>Product size</b>
YJ12565	gacgacggcggaacctatg	Genotyping <i>jph-1(ju1683)</i> and <i>jph-1(ju1684)</i>	WT 154 bp, <i>ju1683</i> 250 bp, <i>ju1683</i> 294 bp, cDNA no product
YJ12566	tcaggtacgttctagtcggt		
YJ12567	gtcttgctggtaacgtcgt		
YJ10503	ggaacaaaggagttcagatcctgtg	Genotyping single copy insertion ( <i>juSi</i> ) on Chromosome IV	WT 562 bp, <i>juSi</i> 744 bp
YJ10504	ggaagacccttagttcacaacaagtg		
YJ10686	TTTTcagaaatatatgccgaggatgttc		



YJ12568	gtctacgatcaagtggttca	Genotyping <i>jph-1(ok2823)</i>	WT 273 bp, <i>ok2823</i> 390 bp, cDNA 870 bp
YJ12569	gaacaatagacaccgatgga		
YJ12570	atcaacctggcacgataatt		
YJ12571	ggattccacgaactggtgatg	PCR amplification to genotype <i>unc-68(e540)</i> by Sanger sequencing	453 bp
YJ12572	cttttcagcagcattcacc		
YJ12573	gtacttcgaactgatgcaatgtc	PCR amplification to genotype <i>egl-19(ad695gf)</i> by Sanger sequencing	370 bp
YJ12574	gtgaaatcatcgcacatctccg		
YJ12575	gaatgatccaccacgggttg	PCR amplification to genotype <i>unc-2(zf35gf)</i> by Sanger sequencing	478 bp
YJ12576	catcagaatgagcgtggtgagc		
YJ12052	taaagtaacagccgcgcca	Genotyping <i>esyt-2(ju1408)</i> and <i>esyt-2(ju1409)</i>	WT 324 bp, <i>ju1408</i> 733 bp, <i>ju1409</i> 733 bp
YJ12577	aatatgtgctagcaagtatttga		
YJ12578	ctttgccactgtgtccattg		
YJ12582	cgcgccccagtcgccacatggtgtgacg	Genotyping <i>nuTi144</i>	WT 612 bp, <i>nuTi144</i> no product
YJ12583	gggtacggtattgcaagctggc		
YJ12582	cgcgccccagtcgccacatggtgtgacg	Genotyping <i>nuTi144</i>	WT no product, <i>nuTi144</i> 500bp
YJ12584	agctagcgacggcaaatact		
nuz2308	gttcggtcggacatgggtcagacttgggagcaaccg	Genotyping <i>nuTi456</i>	WT 1004 bp, <i>nuTi456</i> no product
nuz2309	gcacatgtatcatatcacatggtgtagtatcagg		
nuz2308	gttcggtcggacatgggtcagacttgggagcaaccg	Genotyping <i>nuTi456</i>	WT no product, <i>nuTi456</i> 500bp
YJ12584	agctagcgacggcaaatact		
YJ12585	gatctactgtctttgtgctaaagctgtctgg	Genotyping <i>egl-19(nu674)</i>	WT 2297 bp, <i>nu674</i> 2723 bp
YJ12586	ccaaagtaaaggacctaaccgtcaaaatatcc		

YJ12585	gatctactgtcttttgctaaagctgtctgg	Genotyping <i>egl-19(nu674)</i>	WT no product, <i>nu674</i> 1185 bp
YJ12587	cgtactcgtgaagaaccatgtgatcacg		
YJ12588	cgtgaagagctgaactatgtg	Genotyping <i>unc-68(nu664)</i> and <i>unc-68(nu628)</i>	WT 549 bp, <i>nu664</i> 975 bp, <i>nu628</i> 825 bp
YJ12589	cccaactggtagtaatctcttc		

c. crRNAs		
Name	Sequence	Purpose
YJ12590	5'-rCrCrGrUrCrCrGrGrUrArArCrArCrCrUrArUrCrA-3'	Target <i>jph-1</i> exon 1
YJ12591	5'-rArCrGrArCrGrUrUrGrArCrCrArGrCrArArGrArC-3'	Target <i>jph-1</i> exon 9