

REAGENT or RESOURCE SOURCE IDENTIFIER

Antibodies	source	IDENTIFIER
MSP monoclonal antibody (4A5)	DSHB	Cat#4A5; RRID:AB_760348
Goat anti-Rabbit IgG (H+L) CrossAdsorbed Secondary Antibody, Alexa Fluor 488	Invitrogen	Cat#A-11008; RRID: AB_143165
Goat anti-Mouse IgG (H+L) CrossAdsorbed Secondary Antibody, Alexa Fluor 546	Invitrogen	Cat#A-11003; RRID:AB_2206621
Goat anti-Mouse IgG (H+L) CrossAdsorbed Secondary Antibody, Alexa Fluor 555	Invitrogen	Cat#A-21422; RRID: AB_2535844

Bacterial and Virus Strains

Escherichia coli OP50	Caenorhabditis Genetics Center(CGG)	RRID:WB-STRAIN:OP50
-----------------------	-------------------------------------	---------------------

Chemicals, Peptides, and Recombinant Proteins

FM 1-43FX	Invitrogen	Cat#F35355
LysoTracker Red	Invitrogen	Cat#L7528
MitoTracker Red	Invitrogen	Cat#M7512
8% polyformaldehyde	EMS(Electron Microscopy Science)	Cat#157-8
Triton X-100	AMRESCO	Cat#BS084
BSA	LABLEAD	Cat#9048-46-8

Experimental Models: Organisms/Strains

<i>C. elegans</i> : Strain N2	CGC	RRID:WB-STRAIN:N2_(ancestral)
<i>C. elegans</i> : Strain <i>him-5</i> (e1490)	CGC	WB Strain: DR466
<i>C. elegans</i> : Strain <i>him-8</i> (e1489)	CGC	WB Strain: CB489
<i>C. elegans</i> : Strain <i>fem-1</i> (hc17)	Ronald E. Ellis	WB Strain: BA17
<i>C. elegans</i> : Strain <i>fem-3</i> (q96)	Ronald E. Ellis	WB Strain: JK1973
<i>C. elegans</i> : Strain <i>glp-4</i> (bn2)	Ronald E. Ellis	WB Strain: SS104
<i>C. elegans</i> : Strain <i>smnk-1</i> (ibp107); <i>him-5</i>	This paper	LMW 577
<i>C. elegans</i> : Strain <i>smnk-1</i> (ibp116); <i>him-5</i>	This paper	LMW 603
<i>C. elegans</i> : Strain <i>smnk-1</i> (ibp129); <i>him-5</i>	This paper	LMW 586
<i>C. elegans</i> : Strain <i>vha-18</i> (ibp148); <i>him-5</i>	This paper	LMW 567
<i>C. elegans</i> : Strain <i>vha-18</i> (ibp148); <i>him-8</i>	This paper	LMW 512
<i>C. elegans</i> : Strain <i>spe-8</i> (hc40); <i>dpy-4</i> (e1166); <i>him-5</i> (e1490)	CGC	WB Strain: AV125
<i>C. elegans</i> : Strain <i>swm-1</i> (ok1193); <i>him-5</i> (e1490)	CGC	WB Strain: RB1158
<i>C. elegans</i> : Strain <i>smnk-1::gfp</i> ; <i>him-5</i> (GFP knockin at C terminus of smnk-1)	This paper	LMW 681
<i>C. elegans</i> : Strain <i>smnk-1::gfp spe-18</i> (153); <i>him-5</i> (e1490)	This paper	LMW 617
<i>C. elegans</i> : Strain <i>smnk-1</i> (ibp107); <i>swm-1</i> (ok1193); <i>gfp::nkb-2</i> ; <i>him-5</i> (e1490)	This paper	LMW 682

<i>C. elegans</i> : Strain <i>spe-18::mCherry;him-5</i> (e1490)	This paper	LMW 622
<i>C. elegans</i> : Strain <i>spe-18::mCherry;smnk-1::gfp;him-5</i> (e1490)	This paper	LMW 618
<i>C. elegans</i> : Strain <i>smnk-1(ibp107);spe-18::mCherry;him-5</i> (e1490)	This paper	LMW 691
<i>C. elegans</i> : Strain <i>smnk-1(ibp129);spe-18::mCherry;him-5</i> (e1490)	This paper	LMW 716
<i>C. elegans</i> : Strain <i>smnk-1(ibp116);spe-18::mCherry;him-5</i> (e1490)	This paper	LMW 717
<i>C. elegans</i> : Strain <i>gfp::nkb-2;H2B::mCherry;him-5</i> (e1490)	(Wang et al.,2021)	LMW 645
<i>C. elegans</i> : Strain <i>smnk-1::gfp;vha-18(bp119);him-5</i> (e1490)	This paper	LMW616
<i>C. elegans</i> : Strain <i>smnk-1(ibp107);gfp::nkb-2;H2B::mCherry;him-5</i> (e1490)	This paper	LMW 510
<i>C. elegans</i> : Strain <i>vha-18::mCherry; him-5</i> (e1490) (mCherry knock in at C terminus of <i>vha-18</i>)	This paper	LMW609
<i>C. elegans</i> : Strain <i>vha-18::mCherry; gfp::nkb-2; him-5</i> (e1490)	This paper	LMW613
<i>C. elegans</i> : Strain <i>vha-18::mCherry; gfp::sac-1; him-5</i> (e1490)	This paper	LMW600

Oligonucleotides

Primer for RT-PCR: <i>smnk-1</i> forward: 5'-CGGGTGGCAAGCATTATT-3'	This paper	N/A
Primer for RT-PCR: <i>smnk-1</i> reverse: 5'-CGAAGAAGTGGGTTGACTTG-3'	This paper	N/A
Primer for RT-PCR: <i>act-1</i> forward: 5'-GCCATCCTTCTTGGGTATG-3'	This paper	N/A
Primer for RT-PCR: <i>act-1</i> reverse: 5'-GAGGGAAGCGAGGATAGAT-3'	This paper	N/A
<i>smnk-1</i> sgRNA target for <i>ibp107</i> mutation using CRISPR-Cas9: ATCGGTGTTTCTAGTGGAGA	This paper	N/A
<i>smnk-1</i> sgRNA target for <i>ibp116</i> mutation using CRISPR-Cas9: GGGTTGACTTGCCAGTCAAA	This paper	N/A
<i>smnk-1</i> sgRNA target for <i>ibp129</i> mutation using CRISPR-Cas9:CAACAGATGGACCATGCGGA	This paper	N/A
<i>smnk-1</i> sgRNA target for GFP knock-in using CRISPR-Cas9:CAACTCTATTGGATCTCCGC	This paper	N/A
Primer for <i>smnk-1</i> homology arms for GFP knock-in using CRISPR-Cas9 forward:5'-GCTTCTCGAATTGCTCCT-3'	This paper	N/A
Primer for <i>smnk-1</i> homology arms for GFP knock-in using CRISPR-Cas9 reverse:5'-AGGCCTGCATTCATGTTC-3'	This paper	N/A
<i>spe-18</i> sgRNA target for <i>ibp153</i> mutation using CRISPR-Cas9:CTTCTCGACTTTCTTCTGAT	This paper	N/A
<i>spe-18</i> sgRNA target for mCherry knock-in using CRISPR-Cas9: GAGGCCAAGTCATTGAGCAC	This paper	N/A
Primer for <i>spe-18</i> homology arms for mCherry knock-in using CRISPR-Cas9 forward:5'-TTGTGCACTCGGACTACTA-3'	This paper	N/A

Primer for <i>spe-18</i> homology arms for mCherry knock-in using CRISPR-Cas9 reverse:5'-GTGATTTGCCGGGATTGA-3'	This paper	N/A
<i>vha-18</i> sgRNA target for <i>ibp119</i> mutation using CRISPR-Cas9: (1) CCAATTGGGGACTTTTCACG; (2) TGAAAAATTACTACGTAATA; (3) AGAACGGAGCACAGTACTCT	This paper	N/A
Primer for <i>vha-18</i> homology arms for mCherry knock-in using CRISPR-Cas9 forward:5'-GGATACGCTTGAGATACATT-3'	This paper	N/A
Primer for <i>vha-18</i> homology arms for mCherry knock-in using CRISPR-Cas9 forward:5'-CACTAATATCATTCAGATCC-3'	This paper	N/A
<i>vha-18</i> sgRNA target for mCherry knock-in using CRISPR Cas9:TCAATAACTGGAAGGACCTC	This paper	N/A

Recombinant DNA

Plasmid pef3::Cas9 + Empty sgRNA	Guangshuo Ou	pDD162; Addgene plasmid # 47549
Plasmid contains rol-6(su1006)	Guangshuo Ou	pRF4
Plasmid Cas9 sgRNA construct for <i>smnk-1(ibp107)</i>	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>smnk-1(ibp116)</i>	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>smnk-1(ibp129)</i>	This paper	N/A
Plasmid contains <i>ibp116, ibp129</i> mutation homologous repair template	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>spe-18(ibp153)</i>	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>smnk-1::gfp</i> homologous repair template	This paper	N/A
Plasmid contains <i>smnk-1::gfp</i> homologous repair template	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>spe-6::mCherry</i> homologous repair template	This paper	N/A
Plasmid contains <i>spe-6::mCherry</i> homologous repair template	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>spe-18::mCherry</i> homologous repair template	This paper	N/A
Plasmid contains <i>spe-18::mCherry</i> homologous repair template	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>vha-18(ibp119)</i>	This paper	N/A
Plasmid contains <i>vha-18::mCherry</i> homologous repair template	This paper	N/A
Plasmid Cas9 sgRNA construct for <i>vha-18::mCherry</i> homologous repair template	This paper	N/A

Software and Algorithms

ImageJ	NIH	RRID:SCR_016137
Excel	Microsoft	RRID:SCR_016137
GraphPad Prism 5	GraphPad Software, Inc	RRID:SCR_002798

FLUOVIEW FV1200 Viewer	Olympus	RRID:SCR_018393
FLUOVIEW FV3000 Viewer	Olympus	RRID:SCR_022549
LSM 980	Zeiss	RRID:SCR_019220

Materials availability

All unique/stable materials generated in this study are available from the Lead Contact upon request.

Data and code availability

This study did not generate unique code or dataset.