

Supplementary file 1. *C. elegans* strain list.

Strain	Genotype	Name and Figures
Calcium imaging: wild-type GCaMP strains		
CX10536	<i>kyEx2595 [str-2::GCaMP2.2b, unc-122::gfp]</i>	"AWC ^{ON} " in Figures 1,5 and Figure 1–figure supplement 1, Figure 5–figure supplements 1-4. "WT" in Figure 3A and Figure 4–figure supplement 1A-C. Also used for all conditions in Figure 2A.
PS6253	<i>pha-1(e2123) III; syEx1238 [srsx-3::GCaMP3, pha-1::pha-1]</i>	"AWC ^{OFF} " in Figure 1, Figure 1–figure supplement 1. "WT" in Figure 3–figure supplement 1A
IV388	<i>ueEx7 [gcy-7::GCaMP3, unc-122::gfp]</i>	"ASEL" in Figures 1,5 and Figure 1–figure supplement 1, Figure 5–figure supplements 1-4. "WT" in Figures 3C, 4A-D and 6B,F and Figure 3–figure supplement 1C, Figure 5–figure supplement 5A,E and Figure 6–figure supplement 1A-C. Also used for all conditions in Figure 2C and Figure 5–figure supplement 5C,G.
IV28	<i>ueEx10 [gcy-5::GCaMP3, unc-122::gfp]</i>	"ASER" in Figure 1, Figure 1–figure supplement 1. "WT" in Figure 3–figure supplement 1B
PY6554	<i>oyEx [gpa-4::GCaMP2.2b, unc-122::dsRed]</i>	"AWA" in Figures 1 and 5 and Figure 1–figure supplement 1, Figure 5–figure supplements 1,3. "WT" in Figure 3B and Figure 4–figure supplement 1E,F. "ASI" in Figure 1 and Figure 1–figure supplement 1. Also used for all conditions in Figure 2B.
PY7336	<i>oyEx [str-1::GCaMP3, unc-122::dsRed]</i>	"AWB" in Figures 1 and 5 and Figure 1–figure supplement 1, Figure 5–figure supplements 1-4. "WT" in Figures 3D,4E,4F,7B,7E and Figure 3–figure supplement 1D, Figure 4–figure supplement 1D, Figure 5–figure supplement 5B,F and Figure 7–figure supplement 1A-C. Also used for all conditions in Figure 2D and Figure 5–figure supplement 5D,H.

IV346	<i>kyEx2865 [sra-6::GCaMP3, unc-122::gfp]</i>	"ASH" in Figure 1, Figure 1–figure supplement 1, Figure 5–figure supplement 3
CX10981	<i>kyEx2866 [sra-9::GCaMP2.2b, unc-122::gfp]</i>	"ASK" in Figure 1, Figure 1–figure supplement 1
IV413	<i>ueEx254 [srh-142::GCaMP3, unc-122::gfp]</i>	"ADF" in Figure 1, Figure 1–figure supplement 1
CX12022	<i>kyEx3290 [sre-1::GCaMP3, unc-122::dsRed]</i>	"ADL" in Figure 1, Figure 1–figure supplement 1
IV69	<i>oyEx [gcy-8::GCaMP3, unc-122::rfp]</i>	"AFD" in Figure 1, Figure 1–figure supplement 1
OF977	<i>ixEx196 [ops-1::GCaMP3, lin-44::rfp]</i>	"ASG" in Figure 1, Figure 1–figure supplement 1
ZD1184	<i>qdEx103 [trx-1::GCaMP5, unc-122::gfp]</i>	"ASJ" in Figure 1, Figure 1–figure supplement 1
Calcium imaging: mutant, rescue and overexpression GCaMP strains		
IV15	<i>unc-13(e51) I; kyEx2595 [str-2::GCaMP2.2b, unc-122::gfp]</i>	" <i>unc-13</i> " in Figure 3A
IV23	<i>unc-31(e928) IV; kyEx2595 [str-2::GCaMP2.2b, unc-122::gfp]</i>	" <i>unc-31</i> " in Figure 3A
IV141	<i>unc-13(e51) I; pha-1 (e2123) III; syEx1238 [srsx-3::GCaMP3, pha-1::pha-1]</i>	" <i>unc-13</i> " in Figure 3–figure supplement 1A
IV44	<i>unc-31(e928) IV; pha-1 (e2123) III; syEx1238 [srsx-3::GCaMP3, pha-1::pha-1]</i>	" <i>unc-31</i> " in Figure 3–figure supplement 1A
IV244	<i>unc-13(e51) I; oyEx [gpa-4::GCaMP2.2b, unc-122::dsRed]</i>	" <i>unc-13</i> " in Figure 3B
IV234	<i>unc-31(e928) IV; oyEx [gpa-4::GCaMP2.2b, unc-122::dsRed]</i>	" <i>unc-31</i> " in Figure 3B
IV104	<i>unc-13(e51) I; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]</i>	" <i>unc-13</i> " in Figure 3–figure supplement 1C
IV22	<i>unc-31(e928) IV; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]</i>	" <i>unc-31</i> " in Figure 3C
IV54	<i>unc-31(e928) IV; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; kyEx875 [odr-3::unc-31, elt-2::gfp]</i>	" <i>unc-31</i> ; <i>AWC::unc-31</i> " in Figure 3C
IV68	<i>unc-13(e51) I; ueEx10 [gcy-5::GCaMP3, unc-122::gfp]</i>	" <i>unc-13</i> " in Figure 3–figure supplement 1B
IV32	<i>unc-31(e928) IV; ueEx10 [gcy-5::GCaMP3, unc-122::gfp]</i>	" <i>unc-31</i> " in Figure 3–figure supplement 1B
IV383	<i>unc-13(e51) I; oyEx [str-1::GCaMP3, unc-122::dsRed]</i>	" <i>unc-13</i> " in Figure 3D
IV381	<i>unc-31(e928) IV; oyEx [str-1::GCaMP3, unc-122::dsRed]</i>	" <i>unc-31</i> " in Figure 3–figure supplement 1D
IV193	<i>ins-1(nr2091) IV; ueEx7 [gcy-7::GCaMP3,</i>	" <i>ins-1</i> " in Figure 4A

	<i>unc-122::gfp</i>	
IV245	<i>ins-1(nr2091) IV; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx152 [odr-3::ins-1::sl2mCherry, unc-122::rfp]</i>	" <i>ins-1; AWC::ins-1</i> " in Figure 4A
IV634	<i>ins-1(nr2091) IV; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx428 [gpa-4deletion::ins-1::sl2mCherry, unc-122::rfp]</i>	" <i>ins-1; AWA::ins-1</i> " in Figure 4A
IV655	<i>ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx448 [odr-3::ins-1 sense::sl2mCherry, odr-3::ins-1 antisense::sl2mCherry, unc-122::rfp]</i>	" <i>AWC::ins-1 RNAi</i> " in Figure 4B,G
CX10926	<i>ins-1(nr2091) IV; kyEx2595 [str-2::GCaMP2.2b, unc-122::gfp]</i>	" <i>ins-1</i> " in Figure 4–figure supplement 1A
IV172	<i>daf-2(e1370) III; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]</i>	" <i>daf-2</i> " in Figure 4C
IV224	<i>daf-2(e1370) III; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx139 [gcy-7::daf-2::sl2mCherry, unc-122::rfp]</i>	" <i>daf-2; ASEL::daf-2</i> " in Figure 4C
IV175	<i>daf-2(e1370) III; kyEx2595 [str-2::GCaMP2.2b, unc-122::gfp]</i>	" <i>daf-2</i> " in Figure 4–figure supplement 1B
IV96	<i>age-1(hx546) II; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]</i>	" <i>age-1</i> " in Figure 4D
IV114	<i>age-1(hx546) II; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx54 [gcy-7::age-1::sl2mCherry, unc-122::rfp]</i>	" <i>age-1; ASEL::age-1</i> " in Figure 4D
IV98	<i>age-1(hx546) II; kyEx2595 [str-2::GCaMP2.2b, unc-122::gfp]</i>	" <i>age-1</i> " in Figure 4–figure supplement 1C
IV401	<i>unc-17(e245) IV; oyEx [str-1::GCaMP3, unc-122::dsRed]</i>	" <i>unc-17</i> " in Figure 4E, Figure 4–figure supplement 1F
IV487	<i>unc-17(e245) IV; oyEx [str-1::GCaMP3, unc-122::dsRed]; ueEx305 [gpa-4deletion::unc-17::sl2mCherry, unc-122::gfp]</i>	" <i>unc-17; AWA::unc-17</i> " in Figure 4E
IV539	<i>unc-17(e245) IV; oyEx [gpa-4::GCaMP2.2b, unc-122::dsRed]</i>	" <i>unc-17</i> " in Figure 4–figure supplement 1D
IV416	<i>oyEx [str-1::GCaMP3, unc-122::dsRed]; ueEx257 [gpa-4deletion::TeTX::sl2mCherry, unc-122::gfp]</i>	" <i>AWA::TeTX</i> " in Figure 3D
IV392	<i>oyEx [str-1::GCaMP3, unc-122::dsRed]; ueEx131 [odr-3::TeTX::sl2mCherry, elt-2::gfp]</i>	" <i>AWC::TeTX</i> " in Figure 3D
IV216	<i>ueEx131 [odr-3::TeTX::sl2mCherry, elt-2::gfp]</i>	" <i>AWC::TeTX</i> " in Figure 8–figure supplement 2B
IV640	<i>oyEx [str-1::GCaMP3, unc-122::dsRed]; ueEx434 [gpa-4deletion::cho-1</i>	" <i>AWA::cho-1 RNAi</i> " in Figure 4F

	<i>sense:sl2mCherry, gpa-4deletion::cho-1 antisense:sl2mCherry, unc-122::gfp]</i>	
IV644	<i>oyEx [str-1::GCaMP3, unc-122::dsRed]; ueEx438[gpa-4deletion::cha-1 sense:sl2mCherry, gpa-4deletion::cha-1 antisense:sl2mCherry, unc-122::gfp]</i>	"AWA::cha-1 RNAi" in Figure 4F,H
IV654	<i>oyEx [gpa-4::GCaMP2.2b, unc-122::dsRed]; ueEx438[gpa-4deletion::cha-1 sense:sl2mCherry, gpa-4deletion::cha-1 antisense:sl2mCherry, unc-122::gfp]</i>	"AWA::cha-1 RNAi" in Figure 4-figure supplement 1E
IV469	<i>glp-1(e2141ts) III; ueEx7 [gcy-7::GCaMP3, unc-122::gfp]</i>	"glp-1" in Figure 5-figure supplement 5A,E
IV461	<i>glp-1(e2141ts) III; oyEx [str-1::GCaMP3, unc-122::dsRed]</i>	"glp-1" in Figure 5-figure supplement 5B,F
IV532	<i>ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; uthIs202 [aak-2::aak-2(aa1-aa321 gf):Tomato, rol-6]</i>	"aak-2(gf)" in Figure 5-figure supplement 5C,G
IV537	<i>oyEx [str-1::GCaMP3, unc-122::dsRed]; uthIs202 [aak-2::aak-2(aa1-aa321 gf):Tomato, rol-6]</i>	"aak-2(gf)" in Figure 5-figure supplement 5D,H
IV404	<i>ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx247 [ceh-36deletion::tom-1 sense:sl2mCherry, ceh-36deletion::tom-1 antisense:sl2mCherry, unc-122::rfp]</i>	"AWC::tom-1 RNAi" in Figures 6,8E and Figure 6-figure supplement 1
IV467	<i>ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx292 [odr-3::ins-1(OE):sl2mCherry, unc-122::rfp]</i>	"AWC::ins-1(OE)" in Figures 6,8E and Figure 6-figure supplement 1
IV511	<i>ueEx7 [gcy-7::GCaMP3, unc-122::gfp]; ueEx321 [gcy-7::daf-2(OE):sl2mCherry, unc-122::rfp]</i>	"ASEL::daf-2(OE)" in Figure 6 and Figure 6-figure supplement 1
IV497	<i>oyEx [str-1::GCaMP3, unc-122::dsRed]; ueEx310 [gpa-4deletion::unc-17(OE):sl2mCherry, unc-122::gfp]</i>	"AWA::unc-17(OE)" in Figures 7,8D and Figure 7-figure supplement 1
IV596	<i>che-1(p672) I; ueEx247 [ceh-36deletion::tom-1 sense:sl2mCherry, ceh-36deletion::tom-1 antisense:sl2mCherry, unc-122::rfp]</i>	"ASE(-); AWC::tom-1 RNAi" in Figure 6G
IV598	<i>peIs1715 [str-1::mCasp-1, unc-122::mCherry]; ueEx310 [gpa-4deletion::unc-17(OE):sl2mCherry, unc-122::gfp]</i>	"AWB(-); AWA::unc-17(OE)" in Figure 7F
Additional strains for behavior		
N2	Bristol strain	"WT" in all behavior and lifespan figures
PY7502	<i>oyIs [ceh-36del::caspase-3(p12)::nz, ceh-36del::cz::caspase-3(p17), srtx-1::gfp,</i>	"AWC(-)" in Figures 1E,5J

	<i>unc-122::dsRed</i>	
IV658	<i>ueEx257 [gpa-4deletion::TeTX:sl2mCherry, unc-122::gfp]</i>	" <i>AWA::TeTX</i> " in Figures 1E and 5J and Figure 8–figure supplement 2B
PR672	<i>che-1(p672) I</i>	"ASE(-)" in Figures 1E,5J,6G
JN1715	<i>peIs1715 [str-1::mCasp-1, unc-122::mCherry]</i>	"AWB(-)" in Figure 1E,5J,7F
JN1713	<i>peIs1713 [sra-6::mCasp-1, unc-122::mCherry]</i>	"ASH(-)" in Figures 1E,5J
CF1903	<i>glp-1(e2141ts) III</i>	" <i>glp-1</i> " in Figure 5–figure supplement 5I