

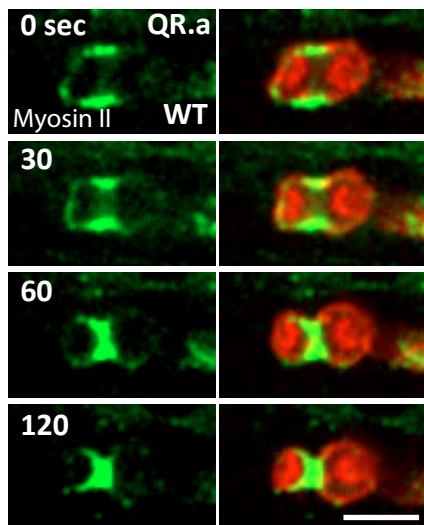
Fig. S1. *ham-1*, *egl-44*, *egl-46* and *egl-13* cloning. (A) Snip-SNP markers (top) and number of recombinants (bottom) of each gene are shown. (B) Extra neuron phenotypes in the canonical alleles. (C) Rescue of extra neuron phenotypes using GFP- or mCherry-tagged HAM-1, EGL-44, EGL-46 and EGL-13. (D) Rescue of daughter cell size asymmetry in *ham-1* mutants by *Pham-1::ham-1::gfp*. In WT animals, Q.aa is half the size of Q.ap. In *ham-1* mutants, Q.aa was 1.1-fold larger than Q.ap, and *Pham-1::ham-1::gfp* reduced the Q.aa/Q.ap ratio to 0.9.

A

Homologues of HAM-1, EGL-44, EGL-46 and EGL-13

<i>C. elegans</i>	<i>D. melanogaster</i>		<i>M. musculus</i>		<i>H. sapiens</i>	
	Protein Name		Protein Name		Protein Name	
	ID	E Value	ID	E Value	ID	E Value
HAM-1	ko-PA		Storkhead-box protein 1		Storkhead-box protein 1	
	CG10573	6.5e-21	TR:B2RQL2	1.9e-24	ENSP00000382118	3.8e-26
EGL-44	sd-PK		Transcriptional enhancer factor TEF-1		Transcriptional enhancer factor TEF-5	
	CG8544	7.7e-69	SW:P30051	5e-68	ENSP00000345772	2.7e-71
EGL-46	nerfin-2-PA		Insulinoma-associated protein 1		Insulinoma-associated protein 2	
	CG12809	9.6e-34	SW:Q63ZV0	4.8e-25	ENSP00000306523	1.7e-22
EGL-13	Sox102F-PB		Transcription factor SOX-13		Transcription factor SOX-5	
	CG11153	6e-51	SW:Q04891	2.7e-47	ENSP00000370788	3.9e-51

B



C

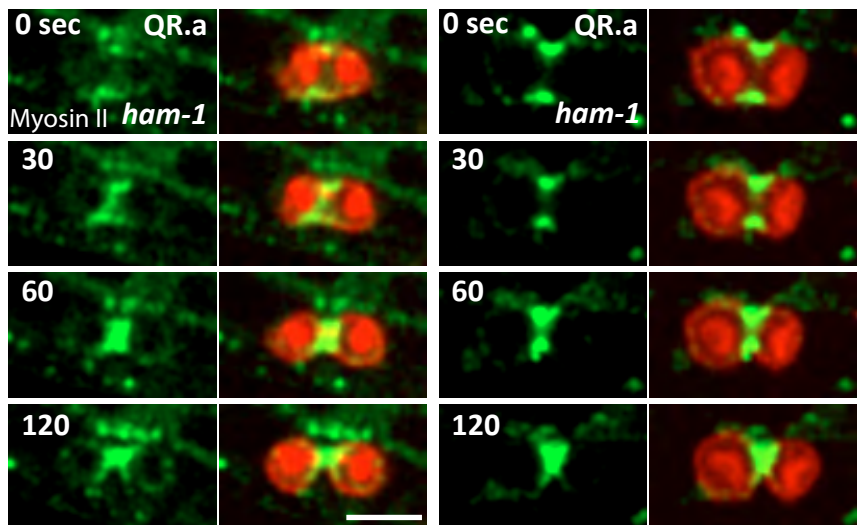


Fig. S2. *ham-1*, *egl-44*, *egl-46* and *egl-13* homologs and myosin II asymmetry in the QR.a cell of WT and *ham-1* mutants. (A) *ham-1*, *egl-44*, *egl-46* and *egl-13* gene homologs across species. Protein names, protein ID and BLAST E-value are shown. (B,C) Still images show the distribution of GFP-tagged non-muscle Myosin II (NMY-2) during QR.a cytokinesis in WT (asymmetry, B) and *ham-1* mutants (symmetry, two examples in C). Plasma membrane and chromosomes (red) were labeled by mCherry fused with a myristoylation signal and histone (HIS-24). Time in seconds is on the top left. Scale bars: 5 μ m.

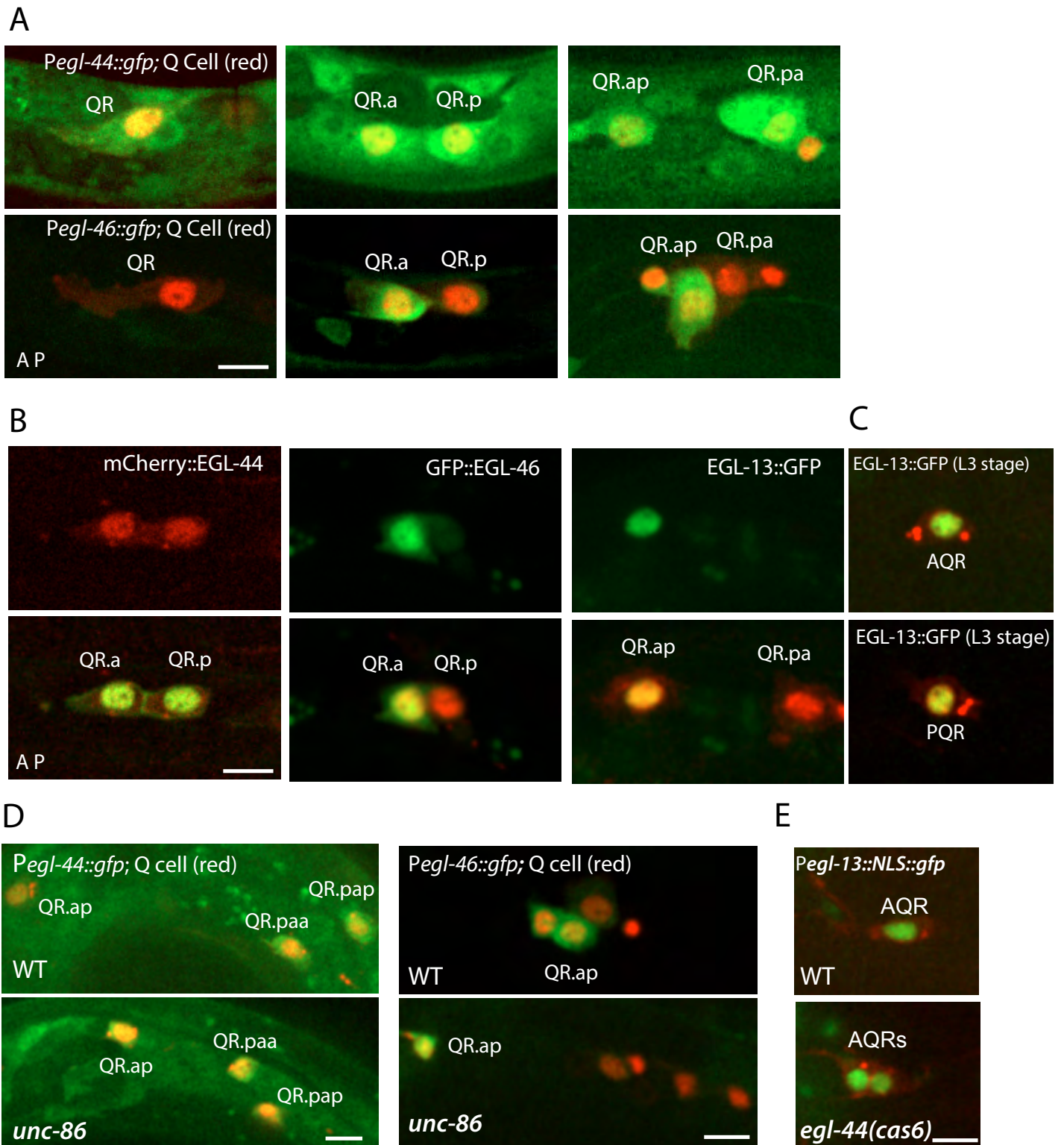


Fig. S3. Expression and localization of EGL-44, EGL-46 and EGL-13 in WT and mutants. (A) Still images of *Pegl-44::gfp* and *Pegl-46::gfp* expression patterns at different developmental stages of the Q neuroblast lineage. (B) Still images show the nuclear localization of EGL-44, EGL-46 and EGL-13 at the L1 larval stage. Either GFP (EGL-46 and EGL-13) or mCherry (EGL-44) was fused with the coding sequence of these TFs. Q cells were labeled with GFP (left) or mCherry (middle and right). Merged images are in the bottom row. (C) Expression of *egl-13* in AQR (top) and PQR (bottom) in the L3 larval stage. A/PQR was marked with mCherry. (D) Expression of *egl-44* (left) and *egl-46* (right) in WT (top) and *unc-86* mutants (bottom). (E) Expression of *egl-13* in AQR of WT (top) and *egl-44* mutants (bottom). Scale bars: 5 μ m.

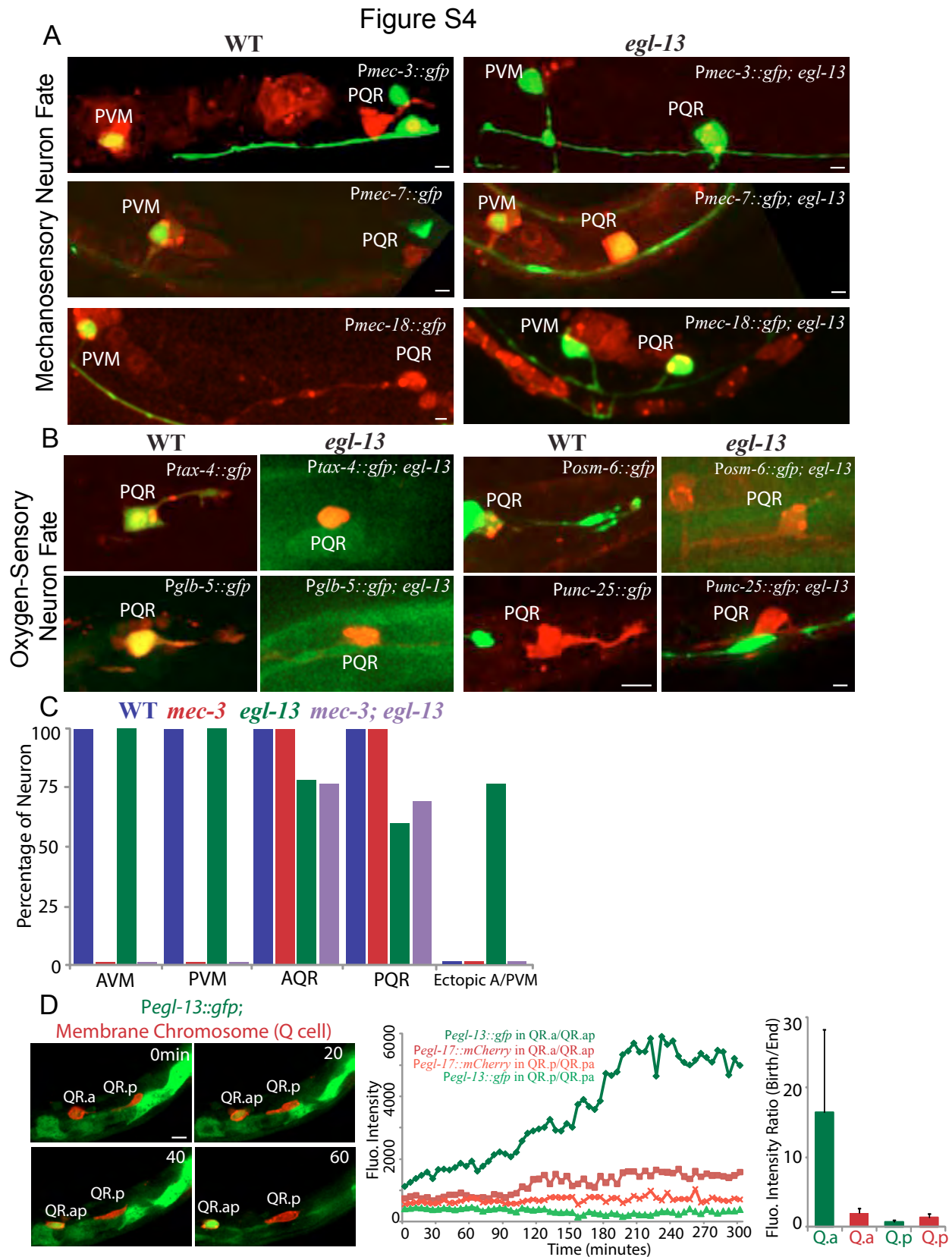


Fig. S4. The neuronal fate in WT and *egl-13* mutants. (A) The fate of mechanosensory neurons in WT and *egl-13* mutants. Q cell plasma membrane and chromosomes (red) were labeled by mCherry. (B) The fate of oxygen sensory neurons in WT and *egl-13* mutants. Q cells were marked by cytosolic GFP or labeled as in A with mCherry. The *unc-25* gene (bottom right) was used as a control to show that not every neuronal fate was changed in *egl-13* mutants. (C) Percentage of AVM, PVM, AQR, PQR or ectopic A/PVM in WT (blue bars), *mec-3* (red), *egl-13* (green) and *mec-3; egl-13* double mutants (purple). $n=62-103$. (D) Still images (left) show *egl-13* gene expression. (Middle) Quantification from the frames on the left and Movie 4. (Right) The fluorescence intensity ratio of *Pegl-13::gfp* markers in Q.a and Q.p cells at birth and at the end of their development ($n=11$ each measurement). mCherry fluorescence in Q cells was used as an internal control. Scale bars: 5 μ m.

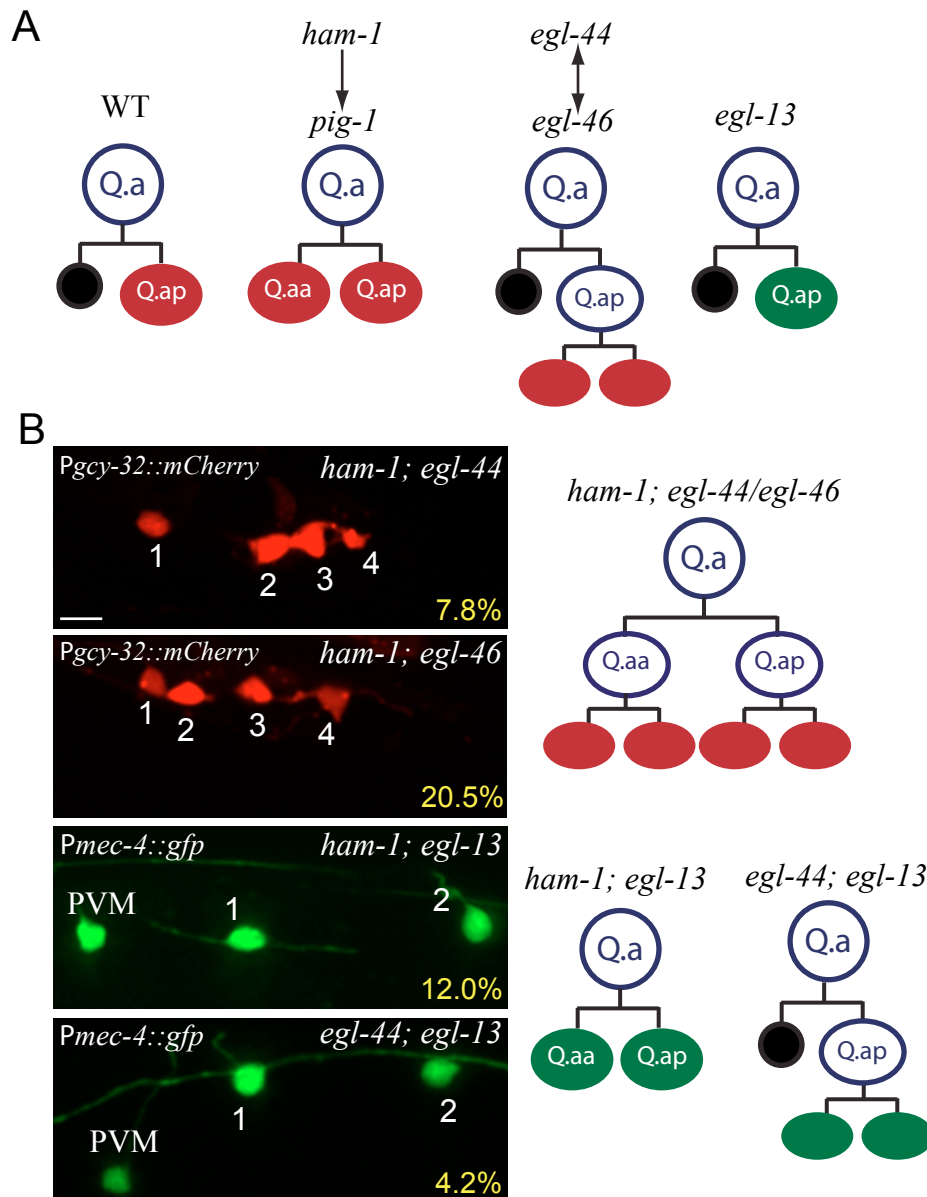


Fig. S5. Sequential actions of TFs in Q cell lineage progression. (A) Summary of Q.a cell phenotype in *ham-1*, *pig-1*, *egl-44*, *egl-46* and *egl-13*. Single-headed arrow shows that HAM-1 promotes *pig-1* expression. Double-headed arrow shows that EGL-44 and EGL-46 bind to each other. (B) Double-mutant phenotypes (left) and summary (right). In *ham-1; egl-44* or *ham-1; egl-46* double mutants, four cells (1-4) express *Pgcy-32::mCherry*. In *ham-1; egl-13* or *egl-44; egl-13* double mutants, two extra cells (1 and 2) express *Pmec-4::gfp*.



Movie 1. HAM-1::GFP dynamics in Q.a and Q.p asymmetric cell division. Transgenic *C. elegans* strain (GOU418) expressing GFP-tagged HAM-1 protein (green) and mCherry labeling of Q cell membrane and histone in Q cells (red). Frames were taken every 30 seconds for 40 minutes. The display rate is seven frames per second.



Movie 2. An extra round of division of QR.ap in the *egl-44* mutant. *C. elegans* strain (GOU247) expressing mCherry labels the Q cell membrane and histone in Q cells (red) in the *egl-44* mutant. Frames were taken every minute for 247 minutes. The display rate is seven frames per second.



Movie 3. An extra round of division of QR.ap in the *egl-46* mutant. *C. elegans* strain (GOU463) expressing mCherry labels the Q cell membrane and histone in Q cells (red) in the *egl-46* mutant. Frames were taken every 30 seconds for 250 minutes. The display rate is seven frames per second.



Movie 4. The expression of GFP under the control of the *egl-13* promoter. Transgenic *C. elegans* strain (GOU774) expressing *Pegl-13::gfp* (green) and mCherry labeling of the Q cell membrane and histone in Q cells (red). Frames were taken every minute for 131 minutes. The display rate is seven frames per second.

Table S1. *C. elegans* strains used in this study

Strain	Genotype	Method	Resource
CB1338	<i>mec-3(e1338)</i>		CGC
MH1157	<i>him-5(e1490); egl-13(ku194)</i>		CGC
MT1078	<i>egl-13(n483)</i>		CGC
MT2247	<i>egl-44(n1080)</i>		CGC
MT2316	<i>egl-46(n1127)</i>		CGC
NG4531	<i>zdis5[Pmec-4::gfp; lin-15(+)]; ham-1(gm279)</i>		Gian Garriga's Lab
RV83	<i>zuls45[Pnmy-2::nmy-2::gfp; unc-119(+)]; rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>		CGC
SK4005	<i>zdis5[Pmec-4::gfp; lin-15(+)]</i>		CGC
GOU127	<i>him-5(e1490); zdis5[Pmec-4::gfp; lin-15(+)]</i>	Cross <i>e1490</i> with <i>zdis5</i>	This study
GOU139	<i>egl-44(cas6); zdis5[Pmec-4::gfp; lin-15(+)]</i>	EMS mutagenesis and outcross and cross with GOU173	This study
GOU143	<i>egl-13(cas10); zdis5[Pmec-4::gfp; lin-15(+)]</i>	EMS mutagenesis and outcross	This study
GOU148	<i>par-4(it47); rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross <i>it47</i> with <i>rdvls1</i>	This study
GOU173	<i>casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection and integration	This study
GOU174	<i>zdis5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross <i>zdis5</i> with <i>casls35</i>	This study
GOU175	<i>casls36[Pgcy-32::gfp; unc-76(+)]</i>	Microinjection and integration	This study
GOU194	<i>par-4(it47); zdis5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross with <i>it47; zdis5;</i>	This study

		<i>casIs35</i>	
GOU196	<i>par-4(it57); zdlS5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross with <i>it57; zdlS5; casIs35</i>	This study
GOU202	<i>egl-46(cas16); casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU210	<i>egl-46(cas18); casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU211	<i>egl-44(cas19); casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU217	<i>zdlS5[Pmec-4::gfp; lin-15(+)]; egl-13(cas11); casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU220	<i>zdlS5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]; egl-13(cas22)</i>	EMS mutagenesis and outcross	This study
GOU222	<i>egl-46(cas24); zdlS5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU246	<i>him-5(e1490); zdlS5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	cross <i>casIs35</i> with GOU174	This study
GOU247	<i>egl-44(cas6); casIs22[Pegl-17::gfp-TEV-S::cmd-1, Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	cross <i>cas6</i> with <i>casIs22</i>	This study
GOU254	<i>egl-44(cas6); zdlS5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross <i>cas6</i> with <i>casIs35</i>	This study
GOU256	<i>egl-44(cas3); zdlS5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross and cross with GOU173	This study

GOU257	<i>egl-44(n1080); lin-15(+); unc-76(+)</i> ; <i>zdl5[Pmec-4::gfp]; casIs35[Pgcy-32::mCherry;</i>	Cross <i>n1080</i> with GOU246	This study
GOU275	<i>rrf-3(pk1426); lin-15(+); unc-76(+)</i> ; <i>zdl5[Pmec-4::gfp]; casIs35[Pgcy-32::mCherry;</i>	Cross <i>pk1426;zdl5; casIs35</i>	This study
GOU302	<i>egl-13(cas11); unc-76(+); casIs22[Pegl-17::Myri-mcherry; Pegl-17::gfp::TEV-S::CMD-1; Pegl-17::mcherry::TEV-S::his-24; pRF4(+)]</i>	cross <i>cas11</i> with <i>casIs22</i>	This study
GOU354	<i>ayIs9[Pegl-17::gfp; casIs35[Pgcy-32::mCherry; unc-76(+)]</i> ; <i>dpy-20(+)</i> ;	cross <i>casIs35</i> with <i>ayIs9</i>	This study
GOU370	<i>egl-13(cas8); zdl5[Pmec-4::gfp; lin-15(+); casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU371	<i>rdvIs1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i> ; <i>kulS29[Pegl-13::NLS::GFP; unc-119(+)]</i>	cross <i>rdvIs1</i> with <i>kulS29</i>	This study
GOU375	<i>zdl5[Pmec-4::gfp; lin-15(+); rdvIs1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross <i>zdl5</i> with <i>rdvIs1</i>	This study
GOU376	<i>ham-1(cas46); lin-15(+); unc-76(+)</i> ; <i>zdl5[Pmec-4::gfp]; casIs35[Pgcy-32::mCherry,</i>	EMS mutagenesis and outcross	This study
GOU378	<i>ham-1(cas46); casIs22[Pegl-17::gfp-TEV-S::cmd-1, Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross <i>cas46</i> with <i>casIs22</i>	This study
GOU381	<i>egl-13(cas11); casEx1505[Pegl-13::egl-13::gfp; Pegl-17::myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i> ;	Microinjection	This study
GOU388	<i>ham-1(cas46); wglS102[Pham-1::ham-1::TY1::EGFP::3Xflag; unc-119(+)]</i> ; <i>casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross <i>cas46; wglS102; casIs35</i>	This study
GOU392	<i>egl-13(cas11); casEx553[Pglb-5::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU393	<i>egl-13(cas11); casEx551[Pgcy-36::gfp; Pegl-17::Myri-mCherry;</i>	Microinjection	This study

	<i>Pegl-17::mCherry-TEV-S::his-24;</i> <i>unc-76(+)</i> ;		
GOU394	<i>egl-13(cas11); casEx554[Ptax-4::gfp;</i> <i>Pegl-17::Myri-mCherry;</i> <i>Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU396	<i>zdIs5[Pmec-4::gfp; lin-15(+)];</i> <i>casIs35[Pgcy-32::mCherry; unc-76(+)];</i> <i>egl-13(cas12)</i>	EMS mutagenesis and outcross	This study
GOU397	<i>muls32[Pmec-7::gfp; lin-15(+)];</i> <i>rdvIs1[Pegl-17::Myri-mCherry;</i> <i>Pegl-17::mig-10::yfp;</i> <i>Pegl-17::mCherry-TEV-S::his-24; pRF4]</i>	cross <i>rdvIs1</i> with <i>muls32</i>	This study
GOU398	<i>rdvIs1[Pegl-17::Myri-mCherry;</i> <i>Pegl-17::mig-10::yfp;</i> <i>Pegl-17::mCherry-TEV-S::his-24; pRF4(+)];</i> <i>mnIs17[Posm-6::osm-6::gfp; unc-36(+)]</i>	cross <i>rdvIs1</i> with <i>mnIs17</i>	This study
GOU406	<i>zdIs5[Pmec-4::gfp; lin-15(+)];</i> <i>mec-3(e1338)IV;</i> <i>casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	cross <i>zdIs5;</i> <i>casIs35</i> with <i>e1338</i>	This study
GOU407	<i>zdIs5[Pmec-4::gfp; lin-15(+)];</i> <i>mec-3(e1338)IV; egl-13(cas11);</i> <i>casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	cross <i>e1338</i> with <i>egl-13(cas11);</i> <i>zdIs5; casIs35</i>	This study
GOU424	<i>egl-13(cas11);</i> <i>rdvIs1[Pegl-17::Myri-mCherry;</i> <i>Pegl-17::mig-10::yfp;</i> <i>Pegl-17::mCherry-TEV-S::his-24; pRF4(+)];</i> <i>muls32[Pmec-7::gfp; lin-15(+)]</i>	cross <i>rdvIs1</i> with <i>muls32</i>	This study
GOU429	<i>casEx1506[Pmec-3::gfp;</i> <i>Pegl-17::Myri-mCherry;</i> <i>Pegl-17::mCherry-TEV-S::his-24;</i> <i>unc-76(+)];</i> <i>rdvIs1[Pegl-17::Myri-mCherry;</i> <i>Pegl-17::mig-10::yfp;</i> <i>Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Microinjection	This study
GOU430	<i>egl-13(cas11); egl-44(cas6);</i> <i>zdIs5[Pmec-4::gfp; lin-15(+)];</i> <i>casIs35[Pgcy-32::mCherry; unc-76(+)];</i>	Cross <i>cas11</i> with <i>cas6</i>	This study
GOU431	<i>egl-13(cas11);</i> <i>rdvIs1[Pegl-17::Myri-mCherry;</i> <i>Pegl-17::mig-10::yfp;</i> <i>Pegl-17::mCherry-TEV-S::his-24; pRF4(+)];</i> <i>casEx1506[Pmec-3::gfp;</i> <i>Pegl-17::Myri-mCherry;</i>	Microinjection	This study

	<i>Pegl-17::mCherry-TEV-S::his-24; unc-76(+)</i>		
GOU438	<i>egl-13(cas11); rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]; mnl17[Posm-6::osm-6::gfp; unc-36(+)]</i>	cross <i>rdvls1</i> with <i>mnl17</i>	This study
GOU444	<i>egl-13(cas11); zdl5[Pmec-4::gfp; lin-15(+)]; rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	cross <i>cas11</i> with <i>rdvls1</i>	This study
GOU454	<i>egl-13(cas11); ham-1(cas46); zdl5[Pmec-4::gfp; lin-15(+)]; cas135[Pgcy-32::mCherry; unc-76(+)]</i>	cross <i>cas11</i> with <i>cas46</i>	This study
GOU463	<i>egl-46(cas36); rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	cross <i>cas36</i> with <i>rdvls1</i>	This study
GOU464	<i>rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]; juls76[Punc-25::GFP; lin-15(+)]</i>	cross <i>rdvls1</i> with <i>juls76</i>	This study
GOU465	<i>egl-13(cas11); rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]; juls76[Punc-25GFP; lin-15(+)]</i>	cross <i>rdvls1</i> with <i>juls76</i>	This study
GOU473	<i>egl-46(cas36); ham-1(cas46); cas132[Pegl-17::gfp-TEV-S::cmd-1, Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross with <i>cas36; cas46;</i> <i>cas132</i>	This study
GOU477	<i>egl-44(cas6); ham-1(cas46); cas132[Pegl-17::gfp-TEV-S::cmd-1, Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross with <i>cas6; cas46;</i> <i>cas132</i>	This study
GOU489	<i>zuls20[Ppar-3::par-3::ZF1::GFP; unc-119(+)]; rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross <i>zuls20</i> with <i>rdvls1</i>	This study
GOU498	<i>ham-1(gm279); zdl5[Pmec-4::gfp; lin-15(+)]; cas135[Pgcy-32::mCherry; unc-76(+)]</i>	Cross <i>gm279</i> with GOU246	This study

GOU517	<i>ham-1(cas46); zuls45[Pnmy-2::nmy-2::gfp; unc-119(+)]; rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross with <i>cas46; zuls45; rdvls1</i>	This study
GOU518	<i>egl-13(cas11); casEx588[Pmec-18::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU519	<i>egl-13(cas11); ham-1(gm279); zdls5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross <i>cas11</i> with <i>casls35</i>	This study
GOU60	<i>casls22[Pegl-17::gfp-TEV-S::cmd-1, Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Microinjection and integration	This study
GOU619	<i>egl-13(cas11); ayls9[Pegl-17::gfp; dpy-20(+); casls35[Pgcy-32::mCherry; unc-76(+)]</i>	cross <i>cas11</i> with <i>ayls9</i>	This study
GOU631	<i>casEx609[Pegl-17::Sox5::gfp; Pegl-17::Myri-mCherry; Pegl-17 mCherry-TEV-S::his-24; unc-76(+)]; egl-13(cas11); zdls5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study
GOU663	<i>casEx609[Pegl-17::Sox5::gfp; Pegl-17::Myri-mCherry; Pegl-17 mCherry-TEV-S::his-24; unc-76(+)]; zdls5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study
GOU670	<i>casEx1513[Pegl-17::egl-13::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]; zdls5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study
GOU672	<i>egl-13(cas11); casEx1513[Pegl-17::egl-13::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]; zdls5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study
GOU673	<i>casEx1515[Pmec-7::egl-13::gfp; Pegl-17::Myri-mCherry; Pegl-17 mCherry-TEV-S::his-24; unc-76(+)]; zdls5[Pmec-4::gfp; lin-15(+)]; casls35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study

GOU734	<i>par-2(or640); casIs22[Pegl-17::gfp-TEV-S::cmd-1; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Cross <i>or640</i> with <i>casIs22</i>	This study
GOU735	<i>par-2(or640); zdl5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross with <i>or640; zdl5; casIs35</i>	This study
GOU739	<i>ham-1(cas27); zdl5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU740	<i>ham-1(cas137); zdl5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU764	<i>egl-46(cas25); zdl5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU765	<i>egl-46(cas36); zdl5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU766	<i>egl-44(cas58); zdl5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU767	<i>egl-46(cas133); casIs36[Pgcy-32::gfp; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU768	<i>egl-44(cas140); casIs36[Pgcy-32::gfp; unc-76(+)]</i>	EMS mutagenesis and outcross	This study
GOU769	<i>unc-76(e911); casEX1115[Pegl-46::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU770	<i>unc-76(e911); casEX1116[Pegl-44::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU771	<i>unc-76(e911); casEX1118[Pegl-46::gfp-TEV-S::egl-46; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU772	<i>unc-76(e911); casEX1122[Pegl-17::mCherry-TEV-S::egl-44 b; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study

GOU773	<i>egl-44(cas6); casEX1125[Pegl-17::TEAD3::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]</i>	Microinjection	This study
GOU774	<i>unc-76(e911); casEx1501[Pegl-13::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU775	<i>unc-76(e911); casEx1505[Pegl-13::egl-13::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU776	<i>unc-76(e911); casEx1513[Pegl-17::egl-13::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU777	<i>unc-76(e911); casEx1515[Pmec-7::egl-13::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU778	<i>unc-76(e911); casEx551[Pgcy-36::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU779	<i>unc-76(e911); casEx553[Pglb-5::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU780	<i>unc-76(e911); casEx554[Ptax-4::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU781	<i>unc-76(e911); casEx588[Pmec-18::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU782	<i>unc-76(e911); casEx609[Pegl-17::Sox5::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Microinjection	This study
GOU853	<i>egl-44(cas6); rdvls1[Pegl-17::Myri-mCherry; Pegl-17::mig-10::yfp; Pegl-17::mCherry-TEV-S::his-24; pRF4(+)]; kuls29[Pegl-13::NLS::GFP; unc-119(+)]</i>	cross <i>cas6</i> with <i>rdvls1; kuls29</i>	This study
GOU863	<i>casEx849[pPD95.77-Ppig-1::pig-1a::GFP; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24];pig-1(gm3 44); zdls5[Pmec-4::gfp; lin-15(+)]</i>	Microinjection	This study

	<i>casIs35[Pgcy-32::mCherry; unc-76(+)]</i>		
GOU868	<i>ham-1(cas46);casEx843[Pgcy-32::pig-1a::GFP; Pegl-17::Myri-GFP; Pegl-17::GFP-TEV-S::his-24]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study
GOU878	<i>unc-86(e1416); casEX1115[Pegl-46::gfp; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	cross <i>e1416</i> with <i>casEx1115</i>	This study
GOU886	<i>unc-86(e1416); casEX1116[Pegl-44::gfp; Pegl-17::Myri-mCherry, Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	cross <i>e1416</i> with <i>casEx1116</i>	This study
GOU923	<i>ham-1(cas46);casEx831[mec-7::pig-1a::GFP; Pegl-17::Myri-GFP; Pegl-17::GFP-TEV-S::his-24]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study
GOU924	<i>ham-1(cas46);casEx840[Pegl-17::pig-1a::GFP; Pegl-17::Myri-GFP; Pegl-17::GFP-TEV-S::his-24]; zdIs5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Microinjection	This study
GOU937	<i>egl-46(n1127); zdIs5[Pmec-4::gfp; lin-15(+)]; casIs35[Pgcy-32::mCherry; unc-76(+)]</i>	Cross <i>n1127</i> with GOU246	This study
GOU938	<i>egl-46(cas36); casIs223[Pegl-46::gfp-TEVS::egl-46; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Cross <i>cas36</i> with <i>casIs223</i>	This study
GOU939	<i>egl-44(cas6); casIs224[Pegl-17::mCherry-TEV-S::egl-44bt ; Pegl-17::Myri-mCherry; Pegl-17::mCherry-TEV-S::his-24; unc-76(+)]</i>	Cross <i>cas6</i> with <i>casIs224</i>	This study

Table S2. PCR products for *C. elegans* transgenesis

PCR product	Primer 5'	Primer 3'	Template
<i>egl-13</i> promoter	TCACCTGCCCCGACATTA	GGTACCAAGCTTGGGTCTTCG TCTACGGCTCATGCTGG	N2 genomic DNA
<i>gcy-36</i> promoter	CCTGCTTCGAAAAATCAA ACTTCACAT	CATGGTACCAAGCTTGGGTCT CTAAAATAAAAAAATTACAT GATTTC	N2 genomic DNA
<i>tax-4</i> promoter	GATTTTGATATGAATCAG AAATCTTGA	CATGGTACCAAGCTTGGGTCT TCTTGAAACATAATTAATTTT GAGAA	N2 genomic DNA
<i>glb-5</i> promoter	TTCCTCGCCCACGATCAC ATTTATCA	CATGGTACCAAGCTTGGGTCT TCCGTTTCCTTAATTGCAATA ATTT	N2 genomic DNA
<i>mec-3</i> promoter	TTGATCTAAAGTTCATAC TAATCTG	CATGGTACCAAGCTTGGGTCT GCCAATCCAACAGGAGTCTCT AGAC	N2 genomic DNA
<i>mec-18</i> promoter	GCACGCGGTAAGACCCC CCTGGATC	CATGGTACCAAGCTTGGGTCT GCTCACAACCTTCTTGAAGG CGAG	N2 genomic DNA
<i>gfp::unc-54</i> 3' UTR	AGACCCAAGCTTGGTAC CATGAGTAAAGGAGAAG AACTTTTCAC	AAGGGCCCGTACGGCCGACT AGTAGG	Plasmid
<i>egl-44</i> promoter	AAACAAATACTCTTATCT CCGTTAGC	CATGGTACCAAGCTTGGGTCT AATCTTTGAAATAAGAAGTGG GTACG	Fosmid RM0612bC06
<i>egl-44</i> gene_short	ACATGGACAGCGGAGGT GGAGGTAATATGTCGGA AGACGTAGCAGTC	AATATCGCAGCTCCGCCTTTC	Fosmid WRM0612bC06

<i>Pegl-44::gfp</i>	AAACAAATACTCTTATCT CCGTTAGC	GGAAACAGTTATGTTTGGTAT ATTGGG	PCR product <i>egl-44</i> promoter and <i>gfp::unc-54</i> 3' UTR
<i>Pegl-17::Myri-mCherry-TEV-S::egl-44b</i>	CTTCCGTTCTATGGAACA CTC	GACATTCTATGGAAAGTGATT GAG	PCR product <i>Pegl-17::mcherry-tev</i> -s and <i>egl-44</i> gene_short
<i>egl-46</i> promoter	TTCCAGATGTTTTCTTC CG	CATGGTACCAAGCTTGGGTCT GGCCTTCTGAAATCAAACGA	N2 genomic DNA
<i>egl-46</i> gene	ACATGGACAGCGGAGGT GGAGGTACTATGGTGCC TATGAATGACTTTTGG	GAAGACATTATCGCATCAGTT ATCC	N2 genomic DNA
<i>Pegl-46::gfp</i>	TTCCAGATGTTTTCTTC CG	GGAAACAGTTATGTTTGGTAT ATTGGG	PCR product <i>egl-46</i> promoter and <i>gfp::unc-54</i> 3' UTR
<i>Pegl-46::gfp-TEVS::egl-46</i>	TTCCAGATGTTTTCTTC CG	GAAGACATTATCGCATCAGTT ATCC	PCR product <i>egl-46</i> promoter, <i>gfp-TEV-S</i> and <i>egl-46</i> gene

Table S3. Plasmids constructed for *C. elegans* transgenesis

Plasmid	Primer 5'	Primer 3'	Notes
pOG233- <i>Pegl-17::TEAD3::gfp</i>	AGCTCACATTTTCGGGC ACCTGAA; CCCGAAATGTGAGCT ATGGCGTCCAACAGCT GGAAC	ATGAGTAAAGGAG AAGAACTTTTCAC; TTCTCCTTTACTCAT GTCTTTGACGAGCT TGTAGAC	<i>TEAD3</i> coding sequence was amplified from human cDNA and inserted into <i>Pegl-17::gfp</i> plasmid via In-Fusion Advantage PCR cloning kit
pOG234- <i>Pegl-17::Sox5::gfp</i>	CCCGAAATGTGAGCT ATGCTTACTGACCCTGA TTTA	TTCTCCTTTACTCAT GTTGGCTTGCCTG CAATATG	<i>Sox5</i> coding sequence was amplified from cDNA and inserted into <i>Pegl-17::gfp</i> plasmid via In-Fusion Advantage PCR cloning kit
pOG238-pGEX-6p-1- <i>egl-44</i>	GGATCCCAGGGGCCCC TGGAA; GGGCCCTGGGATCCA TGAACTCAATGTTTTGT TCA	GAATCCCAGGGTTCG ACTCGAG; TCGACCCGGAATT CTCATTATCAGAAT CGCCTCC	<i>egl-44</i> coding sequence was amplified from cDNA and inserted into pGEX-6p-1 plasmid via In-Fusion Advantage PCR cloning kit
pOG241-pGADT7- <i>egl-44</i>	AGCGTAATCTGGTACG TCGTA; GTACCAGATTACGCTA TGAACTCAATGTTTTGT TCA	GCAGATGAATCGTA GATACTGA; CTACGATTATCTGC TCATTATCAGAATC GCCTCC	<i>egl-44</i> coding sequence was amplified from cDNA and inserted into pGADT7 plasmid via In-Fusion Advantage PCR cloning kit
pOG242-pGBKT7- <i>egl-44</i>	CAGGTCCTCTCTGAG ATCAG; TCAGAGGAGGACCTGA TGAACTCAATGTTTTGT TCA	GCGGCCGCATAACT AGCATAA; TAGTTATGCGGCCG CTCATTATCAGAAT CGCCTCC	<i>egl-44</i> coding sequence was amplified from cDNA and inserted into pGBKT7 plasmid via In-Fusion Advantage PCR cloning kit
pOG243-	AGCGTAATCTGGTACG	GCAGATGAATCGTA	<i>egl-46</i> coding sequence was

pGADT7- <i>egl-46</i>	TCGTA; GTACCAGATTACGCTA TGGTGCCTATGAATGA CTTT	GATACTGA; CTACGATTCATCTGC TTACATTGTTGGAAT AACTCT	amplified from cDNA and inserted into pGADT7 plasmid via In-Fusion Advantage PCR cloning kit
pOG244- pGBKT7- <i>egl-46</i>	CAGGTCCTCCTCTGAG ATCAG; TCAGAGGAGGACCTGA TGGTGCCTATGAATGA CTTT	GCGGCCGCATAACT AGCATAA; TAGTTATGCGGCCG CTTACATTGTTGGA ATAACTCT	<i>egl-46</i> coding sequence was amplified from cDNA and inserted into pGBKT7 plasmid via In-Fusion Advantage PCR cloning kit
pOG251- pGADT7- <i>egl-44(1-170aa)</i>	AGCGTAATCTGGTACG TCGTA; GTACCAGATTACGCTA TGAACTCAATGTTTTGT TCA	GCAGATGAATCGTA GATACTGA; CTACGATTCATCTGC CTTCTTTTTTGCTTG TTCGTC	<i>egl-44 (1-170aa)</i> coding sequence was amplified from pOG238 and inserted into pGADT7 plasmid via In-Fusion Advantage PCR cloning kit
pOG252-pGADT7- <i>egl-44(171-486aa)</i>	AGCGTAATCTGGTACG TCGTA; GTACCAGATTACGCTA TGGGTGATATTCCCAG TCTTCTT	GCAGATGAATCGTA GATACTGA; CTACGATTCATCTGC TCATTCATCAGAATC GCCTCC	<i>egl-44 (171-486aa)</i> coding sequence was amplified from pOG238 and inserted into pGADT7 plasmid via In-Fusion Advantage PCR cloning kit
pOG253- pGBKT7- <i>egl-46(1-108aa)</i>	CAGGTCCTCCTCTGAG ATCAG; TCAGAGGAGGACCTGA TGGTGCCTATGAATGA CTTT	GCGGCCGCATAACT AGCATAA; TAGTTATGCGGCCG CTTACGGTAGAGGA CGTTTTCGAGA	<i>egl-46 (1-108aa)</i> coding sequence was amplified from human cDNA and inserted into pOG239 plasmid via In-Fusion Advantage PCR cloning kit
pOG254- pGBKT7- <i>egl-46(109-286aa)</i>	CAGGTCCTCCTCTGAG ATCAG; GTACCAGATTACGCTA	GCGGCCGCATAACT AGCATAA; CTACGATTCATCTGC	<i>egl-46 (109-286aa)</i> coding sequence was amplified from pOG242 and inserted into pGBKT7 plasmid via

	TGAACTCAATGTTTTGT TCA	CTAACCAGACAAGT CGGAAAGGGA	In-Fusion Advantage PCR cloning kit
pOG255- pGADT7- <i>TEAD3</i>	AGCGTAATCTGGTACG TCGTA; GTACCAGATTAGCTAT GGCGTCCAACAGCTGG AAC	GCAGATGAATCGTA GATACTGA; CTACGATTCATCTGC GTCTTTGACGAGCT TGTAGAC	<i>TEAD3</i> coding sequence was amplified from human cDNA and inserted into pGADT7 plasmid via In-Fusion Advantage PCR cloning kit
pOG279-pET-28a- <i>egl-46</i>	TCGAGTGCGGCCGCAA GCTTG; TGCGGCCGCACTCGAA TGGTGCCTATGAATGA CTTT	GCACCACCACCACC ACCACTGA; TGGTGGTGGTGGTG CCCCATTGTTGGAA TAACTCTGA	<i>egl-46</i> coding sequence was amplified from cDNA and inserted into pET-28a(+) plasmid via In-Fusion Advantage PCR cloning kit
pOG821-pPD95.77- <i>pig-1a::gfp</i>	GTACCGGTAGAAAAA TGAGCAAGTATGAAGT GCTCC	TTCTCCTTTACTCAT TTCGATTTTCGCCAT TTGAAG	<i>pig-1a</i> cDNA was amplified from cDNA and inserted into pPD95.77 via In-Fusion Advantage PCR cloning kit
pOG836-pPD95.77- <i>Pegl-17::pig-1a::gfp</i>	GTACCGGTAGAAAAAC AGATGGATGTTTACTG CCAACCTGG	TTCATACTTGCTCAT AGCTCACATTTCCGG GCACCTGAA	<i>Pegl-17</i> was amplified from N2 genomic DNA and inserted into pOG821-pPD95.77- <i>pig-1a::gfp</i> plasmid via In-Fusion Advantage PCR cloning kit
pOG837-pPD95.77- <i>Pmec-7::pig-1a::gfp</i>	GTACCGGTAGAAAAAG CAACATGTATGACCATT TTACACG	TTCATACTTGCTCAT GTTGCTTGAAATTT GGACCC	<i>Pmec-7</i> was amplified from N2 genomic DNA and inserted into pOG821-pPD95.77- <i>pig-1a::gfp</i> plasmid via In-Fusion Advantage PCR cloning kit
pOG838-pPD95.77- <i>Pgcy-32::pig-1a::gfp</i>	GTACCGGTAGAAAAAC ACATTATATACGATCG	TTCATACTTGCTCAT TCTATAATACAATCG	<i>Pgcy-32</i> was amplified from N2 genomic DNA and

<i>p</i>	AGGC	TGATCTTCGC	inserted into pOG821-pPD95.77- <i>pig-1a::gfp</i> plasmid via In-Fusion Advantage PCR cloning kit
pOG839-pPD95.77- <i>Ppig-1::pig-1a::gfp</i>	GTACCGGTAGAAAAA GCAGCTGTGTACCGAT T	TTCATACTTGCTCAT GCTG	<i>Ppig-1</i> was amplified from N2 genomic DNA and inserted into pOG821-pPD95.77- <i>pig-1a::gfp</i> plasmid via In-Fusion Advantage PCR cloning kit
pOG851-pPD95.77- <i>Ppig-1(deham-1 binding)::pig-1a::gfp</i> <i>p</i>	TGAAAAATCTGGAAAG TTCATGAAACTTCGTTT	TTCCAGATTTTCA TGAAAA	pOG821-pPD95.77- <i>pig-1a::gfp</i> was amplified using primers listed to delete the ham-1 binding site via In-Fusion Advantage PCR cloning kit
pOG859-pPD95.77- <i>Ppig-1(de_control)::pig-1a::gfp</i>	TGGCCTAGTTCGGCAA ACTC	TGCCGAAGCTAGGCC ATTCATTCGCGTCC TGACAC	pOG821-pPD95.77- <i>pig-1a::gfp</i> was amplified using primers listed to delete the control site via In-Fusion Advantage PCR cloning kit
pOG1105- <i>Pegl-13::egl-13::gfp</i>	AGTGACCTGTTTCGTTTC ACCTGCCCCGACATTA; AGACCCAAGCTTGTA CCATGAGTAAAGGAGA AGA ACTTTTCAC	GGTACCAAGCTTGG GTCTTTCAGCTGTTT GTAGGAG; AGGTCACTAATACC AAAGGGCCCGTACG GCCGA	<i>Pegl-13::egl-13</i> and <i>gfp::unc-54 3'UTR</i> were amplified from N2 genomic DNA and plasmid respectively and inserted into pDONAR via In-Fusion Advantage PCR cloning kit
pWL30- <i>Pmec-7::egl-13::gfp</i>	AGTGACCTGTTTCGTT GCAACATGTATGACCA TTTTACACG	TCGTCTACGGCTCAT GTTGCTTGAAATTT GGACCCGAC	<i>mec-7</i> promoter was amplified from N2 genomic DNA and inserted into

			pOG1105 via In-Fusion Advantage PCR cloning kit
<i>pWL32-Pegl-17::egl-13::gfp</i>	AGTGACCTGTTTCGTT CTTCCGTTCTATGGAAC ACTCATC	TCGTCTACGGCTCAT AGCTCACATTTTCGG GCACCTGAA	<i>egl-17</i> promoter was amplified from N2 genomic DNA and inserted into pOG1105 via In-Fusion Advantage PCR cloning kit