Supplemental Materials

Molecular Biology of the Cell

Lee *et al*.

Supplemental Information

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Gene	Allele	Molecular lesion	Recessivity in suppressing ALM-PN	Strain name [with *mec-7(u278)*]
mec-7	*u1151*	C12Y	recessive	TU6475
	u1152	G13S	recessive	TU6476
	u1153	S25F	semi-dominant	TU6477
	u1154	E69K	dominant	TU6478
	u1155	G71E	recessive	TU6479
	u1040	G98E	recessive	TU5152
	u1156	R121K	recessive	TU6480
	u1157	G141E	recessive	TU6481
	u1169	G146E	recessive	TU6537
	u1158	T149I	recessive	TU6482
	u1159	Q191*	recessive	TU6483
	u1160	D203V	recessive	TU6484
	unk22	A254T	recessive	CGZ46
	u1161	A302V	recessive	TU6485
	u1170	P358S	semi-dominant	TU6538
	u1162	Q384*	recessive	TU6486
	u1171	R391H	recessive	TU6539
	u1164	G402R	recessive	TU6488
	u1163	80bp deletion	recessive	TU6487
mec-12	*u1172*	G13E	semi-dominant	TU6540
	u1173	Q133*	recessive	TU6541
	u1174	G134E	recessive	TU6542
	unk46	G246E	semi-dominant	TU5153
	u1175	T257K	semi-dominant	TU6543
	unk23	G350E	semi-dominant	CGZ47
	u1165	G354E	semi-dominant	TU6489
	u1176	E415K	recessive	TU6544
	u1177	G416E	recessive	TU6545
mec-15	*u1042*	R26*	recessive	TU5183
mbl-1	*u1178*	C86Y	recessive	TU6546

Table S1. A list of *mec-7*(*u278 neo*) suppressors isolated from the screen.

Gene	Allele	Molecular lesion	Recessivity in suppressing ALM-PN	Strain name [with *mec-17(ok2109)*]
mec-7	*u1123*	E3K	Recessive	TU6122
	u1111	Q8*	Recessive	TU6110
	u1118	S25F	Semi-dominant	TU6117
	u1120	S25F	Semi-dominant	TU6119
	u1124	G34S	Recessive	TU6123
	u1115	R86C	Recessive	TU6114
	u1122	S145F	Recessive	TU6121
	u1119	P171L	Dominant	TU6118
	u1114	G223E	Recessive	TU6113
	u1110	L225F	Semi-dominant	TU6109
	u1117	D249N	Dominant	TU6116
	u1121	Q280*	Recessive	TU6120
	u1125	Intron 4 splicing variant	Recessive	TU6124
	u1147	L311F	Recessive	TU6407
	u1116	P357S, Q424L	Recessive	TU6115
	u1113	G369E	Recessive	TU6112
mec-12	*u1130*	M1I; start loss	Recessive	TU6129
	u1129	A19V	Semi-dominant	TU6128
	u1131	P63S	Recessive	TU6130
	u1132	E71K	Semi-dominant	TU6131
	u1128	S178F	Dominant	TU6127
	u1126	S236N	Dominant	TU6125
	u1134	A240T	Recessive	TU6133
	u1127	S241F	Semi-dominant	TU6126
	u1135	G246E	Semi-dominant	TU6134
	u1133	R320C	Semi-dominant	TU6132

Table S2. *mec-7* and *mec-12* alleles isolated from the *mec-17(lf)* suppressor screen.

Allele	Mutation	CRISPR/Cas9 target	Repair template ssDNA
unk64	R121K	5'-GAGTAAGTTGAAATCCTTGA-3'	5'-AGCAGAACTTGTAGACAATGTTCTTGACGTTGTCAAGAAGGAGGCTGAGAGTACTGACTGTCTTCAAGGATTTCAACTTACTCACTCACTTGGAGG-3'
unk62	A254T	5'-CAATGCGGATCTACGAAAGT-3'	5'-ACTTGCCTCCGCTTCCCTGGTCAACTCAATGCGGACCTCCGCAAATTAACAGTGAACATGGTTCCATTCCCACGTCTTCACTTC-3'
unk60	A302V	5'-GCTGCATGCGATCCAAGACA-3'	5'-ACCCAACAATGTTTCGACGCAAAGAACATGATGGCCGTTTGCGACCCTAGGCATGGACGTTATCTCACCGCTGCTGCCATTTTCCG-3'
unk63	R391H	5'-GCCGCAAAGCTTTCCTTCAT-3'	5'-attttgactaatttcatatttttttccagCTATGTTTCGGCATAAGGCATTGCTGCATTGGTACACTGGCGAGGGAATGGACGAGATGGA-3'

Table S3. CRISPR/Cas9 target and repair template sequences used to recreate four missense mutations.

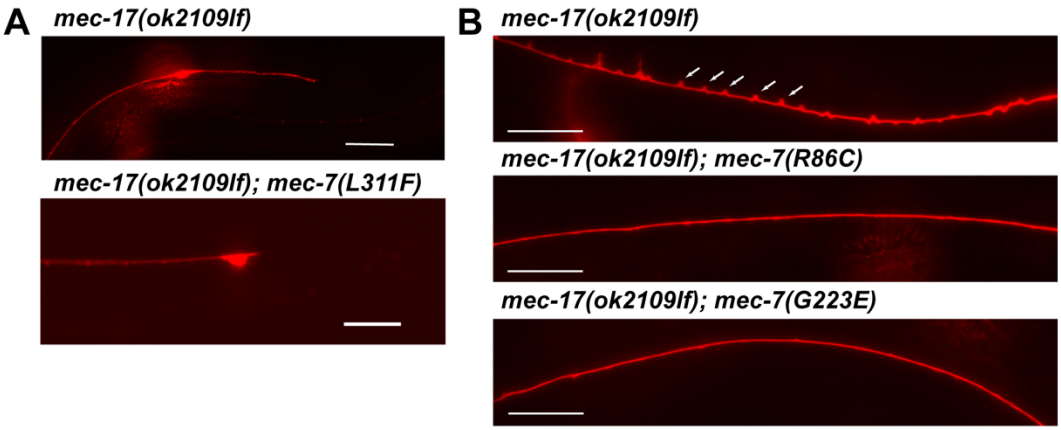

Figure S1. Suppression of *mec-17(-)* phenotypes by mutations in *mec-7*. (A) The ectopic ALM-PN in young adults of *mec-17(ok2109)* deletion allele was suppressed by *mec-7 partial lf* allele carrying L311F mutation. (B) The swelling and looping of ALM-AN in *mec-17(ok2109)* animals were suppressed by *mec-7* weak *neo* mutants.

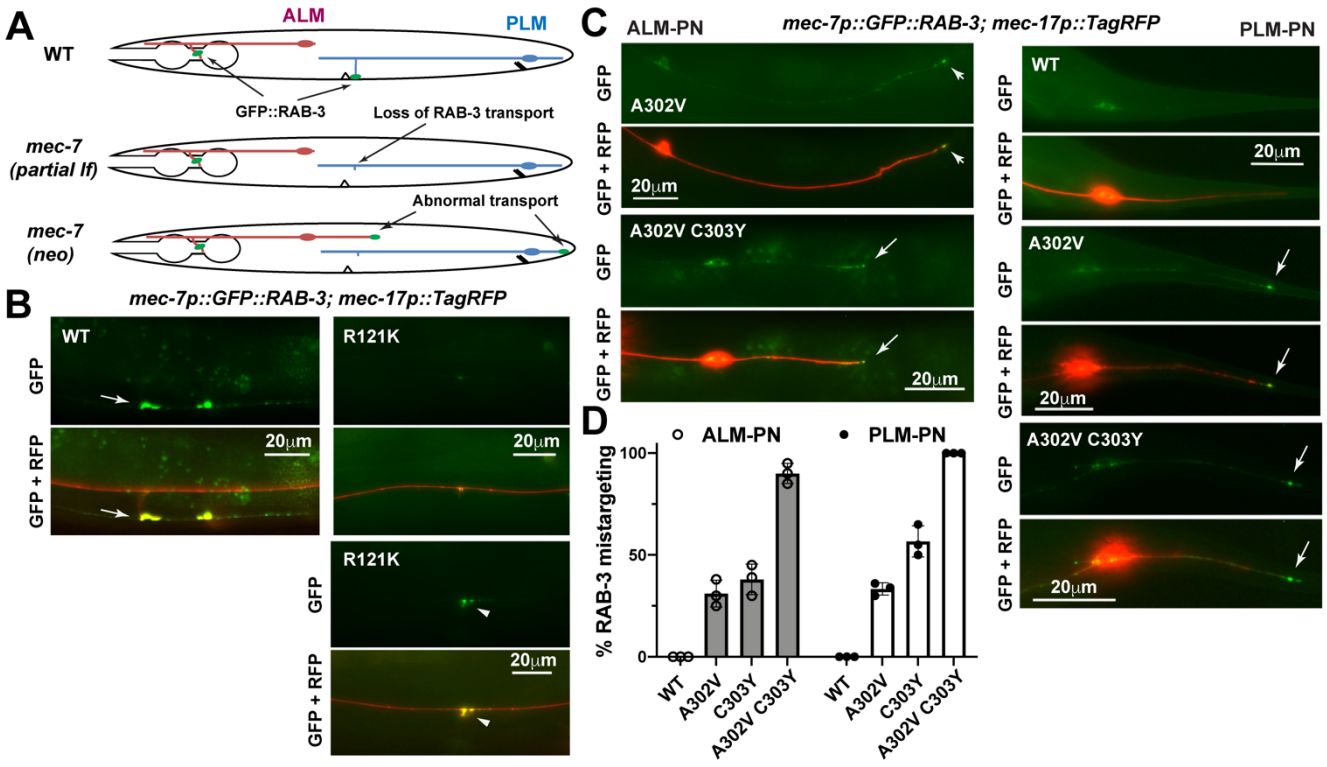

Figure S2. *mec-7* mutations disrupted the transport of synaptic vesicle proteins. (A) Schematic diagram for the localization of GFP-fused synaptic vesicle protein RAB-3 in the TRNs in wild-type and *mec-7* mutant animals. (B) In wild-type animals, GFP::RAB-3 in PLM neurons was located at the place where the synaptic branch of PLM-AN contacted the ventral nerve cord (arrows). In *mec-7*(R121K) partial *lf* mutants, the synaptic branch was not made and no GFP::RAB-3 signal was found on the PLM-AN. In some *mec-7*(R121K) animals, PLM-AN grew a very small branch, where weak GFP::RAB-3 signal was observed (arrow heads). (C) In *mec-7*(A302V *neo*) and *mec-7*(A302V C303Y) mutants, GFP::RAB-3 was mistargeted to the terminals (arrows) of the ALM-PN (left panel) and PLM-PN (right panel). (D) The percentages of ALM and PLM neurons that had the mistargeting of GFP::RAB-3 in *mec-7*(A302V *neo*), *mec-7*(C303Y *neo*), and *mec-7*(A302V C303Y) mutants.

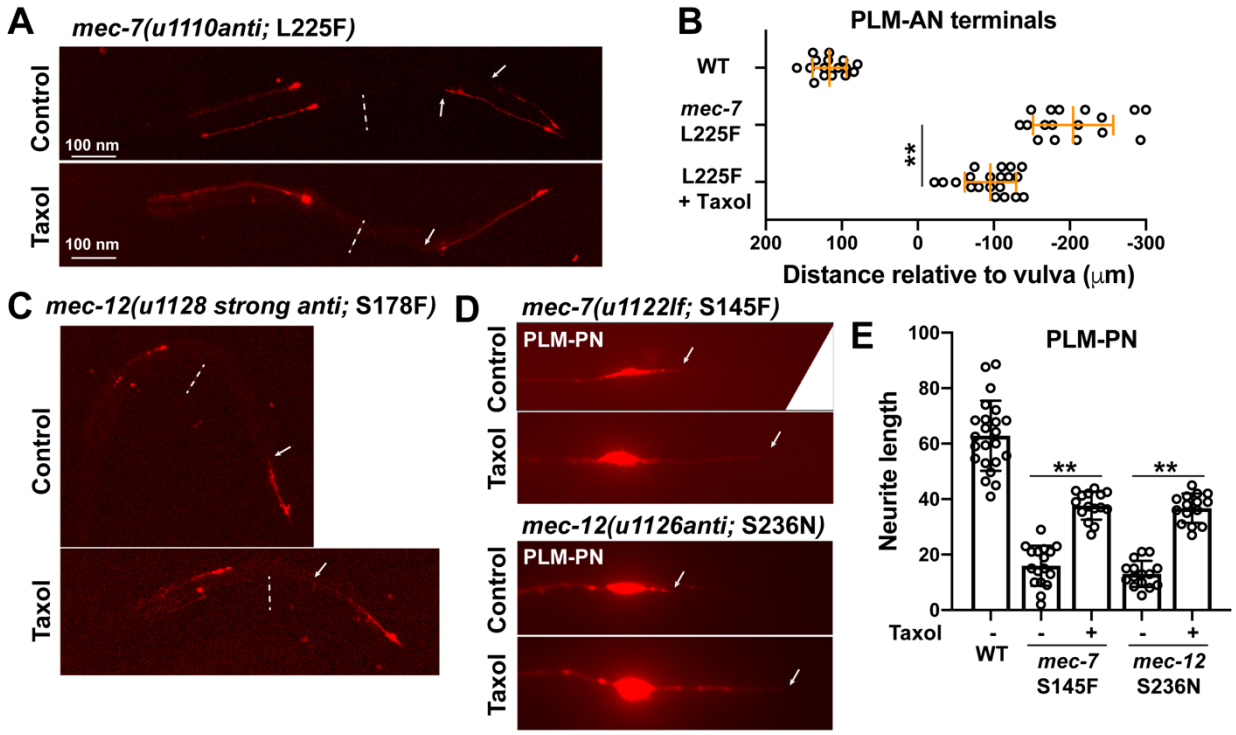

Figure S3. Taxol treatment partially rescued neurite growth defects in tubulin *lf* and *anti* mutants. (A) PLM-AN morphology in *mec-7(u1110anti)* mutants treated with 1 μM paclitaxel (taxol). Dashed line indicates the position of the vulva and the arrows indicate the PLM-AN terminals. (B) The distance between the vulva and the PLM-AN terminals in *mec-7(u1110anti)* mutants treated with taxol. (C) PLM-AN in *mec-12(u1128 strong anti)* mutants treated 1 μM taxol. (D) PLM-PN in *mec-7(u1122lf)* and *mec-12(u1126anti)* mutants treated with 1 μM Taxol. Arrows indicated where PLM-PN ends. (E) The length of PLM-PN in the treated *mec-7(u1122lf)* and *mec-12(u1126anti)* mutants. Double asterisks indicate statistically significance difference ($p < 0.01$).

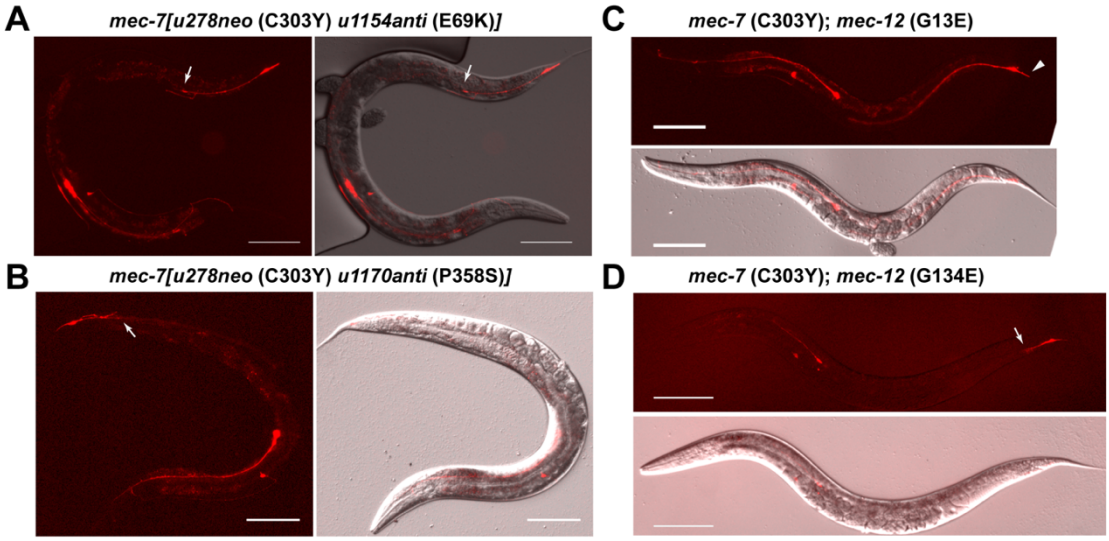

Figure S4. *mec-7* and *mec-12 anti* alleles are epistatic to *mec-7 neo* alleles. (A) *mec-7(neo)* and *mec-7(anti)* double mutants showed the shortening of PLM-AN similar to the *mec-7(anti)* single mutants. Arrows point to the premature termination of PLM-AN. (B) *mec-7(neo)* and *mec-12(anti)* showed similar phenotype as the *mec-12(anti)* alleles alone. In top panel, arrow head points to the shortening of PLM-PN seen before in *mec-12(anti)* alleles. In bottom panel, arrow points to the shortening of PLM-AN seen in the newly isolated strong *anti* alleles of *mec-12*. G13E and G134E are representative *anti* and strong *anti* alleles, respectively.