Table S1. Quantification of NMJ parameters for experiments in Figure 3B.

	Number of smaples	**Bouton number**	p value vs WT	**Muscle area (μm^2)X10^{-3}**	p value vs WT	**Bouton number /Muscle area (#/μm^2)X 10^3**	p value vs WT	**Satellite bouton number**	p value vs WT
w^{1118} (WT)	20	119.85±2.53		89.01±1.48		1.35±0.04		13.6±0.6	
revertant	18	117.72±4.45	1	89.17±0.96	1	1.32±0.04	0.999	12.3±0.7	0.994
spartin^1/spartin^1	20	167.5±3.76	<0.001	87.73±1.4	0.996	1.91±0.03	<0.001	25.2±1.3	<0.001
spartin^1/Df	20	171.7±3.46	<0.001	91.69±1.06	0.816	1.88±0.04	<0.001	25.6±1.3	<0.001
C155-GAL4/+; Df/UAS-HA-spartin,spartin^1	20	116.7±3.95	0.99	91±1.31	0.962	1.29±0.05	0.935	12.3±0.7	0.99
C155-GAL4/+; Df/UAS-HA-spartin ΔEps15,spartin^1	18	171.22±4.28	<0.001	91.42±0.99	0.899	1.87±0.04	<0.001	21.6±1.7	<0.001
C155-GAL4/+; Df/UAS-Myc-spartin-human,spartin^1	20	111.8±2.16	1	92.19±0.47	0.643	1.29±0.02	0.927	12.8±0.4	1
BG57-GAL4,Df/UAS-HA-spartin,spartin^1	17	169.94±4.37	<0.001	93.35±1.24	0.282	1.83±0.06	<0.001	22.5±1.5	<0.001
			p value vs *C155-GAL4/+*		p value vs *C155-*		p value vs *C155-GAL4/+*		p value vs *C155-GAL4/+*
C155-GAL4/+	17	124.59±4.37		91.59±1.85		1.36±0.05		13.2±0.9	
C155-GAL4/+; UAS-HA-spartin/+	16	107.38±5.44	<0.01	93.59±1.6	0.42	1.15±0.05	<0.01	8.2±0.6	<0.001

Table S2. Quantification of NMJ parameters for experiments in Figure S2D.

	Number of samples	**Bouton number**	p value vs WT	**Muscle area (μm^2)X10^{-3}**	p value vs WT	**Bouton number /Muscle area (#/μm^2)X 10^3**	p value vs WT	**Satellite bouton number**	p value vs WT
w^{1118} (WT)	15	125.67±4		91.03±0.93		1.38		13.1	
spartin^{1}/+	10	126.5±1.36	0.999	98.76±1.48	n.s	1.41	0.958	13.5	0.983
eps15^{e75}/+	10	126.4±3.82	0.999	88.45±2.48	n.s	1.43	0.861	12.7	0.99
eps15^{e75}/+, *spartin*^{1}/+	13	159.92±4.84	<0.001	91.38±1.15	n.s	1.75	<0.001	21.3	<0.001

Table S3. Quantification of NMJ parameters for experiments in Figure S3.

Figure S3B

	Number of samples	**Bouton number**	p value vs *C155-GAL4/+*	**Muscle area (μm^2)X10^{-3}**	p value vs *C155-GAL4/+*	**Bouton number /Muscle area (#/μm^2)X 10^3**	p value vs *C155-GAL4/+*	**Satellite bouton number**	p value vs *C155-GAL4/+*
C155-GAL4/+	18	121.28±3.6		90.44±1.6		1.35±0.04		12.4±0.8	
C155-GAL4/+; UAS-wit/+	18	145.17±4.67	<0.01	92.94±1.15	0.761	1.56±0.05	<0.05	14.9±1.6	0.693
C155-GAL4/+; UAS-tkv^{CA}/+	18	166.94±5.04	<0.001	97.11±1.65	0.053	1.72±0.04	<0.001	21±1.4	<0.01
C155-GAL4/+; UAS-wit,UAS-tkv^{CA}/+	17	207.71±6.21	<0.001	85.11±2.65	0.179	2.46±0.07	<0.001	32.5±2.4	<0.001
			p value vs *BG57-GAL4*		p value vs *BG57-GAL4*		p value vs *BG57-GAL4*		p value vs *BG57-GAL4*
BG57-GAL4/+	18	115.5±1.85		91.37±1.58		1.27±0.02		13.1±0.7	
BG57-GAL4/UAS-gbb	21	161.67±4.55	<0.001	88.2±1.5	0.154	1.84±0.05	<0.001	23.8±1.3	<0.001

Figure S3C

	Number of samples	**Bouton number**	p value vs WT	**Muscle area (μm^2)X10^{-3}**	p value vs WT	**Bouton number /Muscle area (#/μm^2)X 10^3**	p value vs WT	**Satellite bouton number**	p value vs WT
w^{1118} (WT)	18	119.33±3	0.905	89.24±1.35		1.34±0.04		12.7±0.6	
spartin^{1}/+	18	126.72±1.52	1	90.4±1.35	n.s	1.41±0.02	0.98	13±0.6	1
dap160$^{\Delta 1}$/+	18	119.06±5.71	1	86.39±2.65	n.s	1.38±0.06	0.998	13.9±0.6	0.987
endoA$^{\Delta 4}$/+	19	121.21±4	1	91.08±1.52	n.s	1.33±0.05	1	13.8±0.9	0.989
synj^{1}/+	20	120.5±3.94	1	90.52±1.63	n.s	1.33±0.04	1	13.6±0.4	0.998
dap160$^{\Delta 1}$/+; spartin^{1}/+	18	163.17±4.31	<0.001	88.54±2.37	n.s	1.86±0.05	<0.001	20.9±1	<0.001
spartin^{1},+/+,endoA$^{\Delta 4}$	18	173.83±4.16	<0.001	88.16±1.39	n.s	1.98±0.05	<0.001	22.9±1.4	<0.001
synj^{1}/+; spartin^{1}/+	16	166.69±4.65	<0.001	94.49±1.26	n.s	1.77±0.06	<0.001	23.6±1.1	<0.001

Table S4. Quantification of NMJ parameters for experiments in Figure 5B.

	Number of samples	**Bouton number**	p value vs WT	**Muscle area (μm^2)X10^{-3}**	p value vs WT	**Bouton number /Muscle area (#/μm^2)X 10^3**	p value vs WT	**Satellite bouton number**	p value vs WT
w^{1118} (WT)	15	119.33±1.93		91.71±1		1.3±0.02		13.8±3.9	
spartin ^{1} */Df*	16	172.19±5.65	<0.001	93.28±1.13	0.949	1.85±0.06	<0.001	25.6±1.5	<0.001
wit ^{A12} */wit* ^{B11}	18	66.39±3.01	<0.001	69.32±1.31	<0.001	0.96±0.04	<0.001	2.1±0.3	<0.001
wit ^{A12} *,spartin* ^{1} */wit* ^{B11} *,Df*	19	68.68±2.65	<0.001	65.69±1.49	<0.001	1.05±0.04	<0.001	3±0.4	<0.001
wit ^{A12} */+*	16	121.38±3.21	0.999	95.16±0.77	0.378	1.28±0.04	0.998	13.2±0.3	0.4
wit ^{A12} *,spartin* ^{1} */+,Df*	24	121.21±2.56	0.999	93.27±0.97	0.929	1.3±0.03	1	13.9±0.5	1

Table S5. Quantification of NMJ parameters for experiments in Figure S4I.

	Number of Samples	Bouton number	p value vs WT	Muscle area (μm^2)X10^{-3}	p value vs WT	Bouton number /Muscle area (#/μm^2)X 10^3	p value vs WT	Satellite bouton number	p value vs WT
w^{1118} (WT)	20	117.7±3.55		91.57±0.85		1.29±0.04		13.1±0.6	
spartin^{1}/Df	20	171.85±3.61	<0.001	91.3±1.21	1	1.88±0.04	<0.001	25.7±1.3	<0.001
futsch^{K68}/+	19	124.89±4.26	0.797	98.63±1.09	<0.01	1.27±0.05	1	11.2±0.5	0.554
futsch^{K68}/+; spartin^{1}/Df	19	134.37±5.29	<0.05	97.74±1.43	<0.05	1.39±0.06	0.653	10.9±0.9	0.406
futsch^{K68}/Y	18	93.5±3.02	<0.001	86.9±1	0.324	1.08±0.03	<0.05	7.3±0.5	<0.001
futsch^{K68}/Y; spartin^{1}/Df	18	99.39±4.07	<0.05	91.78±1.53	1	1.09±0.05	<0.05	7.1±0.6	<0.001
gbb^{1}/+	18	115.56±3.33	1	89.42±1.17	0.991	1.29±0.04	1	10.3±0.5	<0.05
wit^{A12}/+	18	118.89±2.34	1	91.62±1.23	1	1.3±0.04	1	11.4±0.5	0.461
mad^{273}/+	18	118.06±3.67	1	91.96±1.33	1	1.29±0.05	1	11.6±0.6	0.633
futsch^{K68}/+; gbb^{1}/+	18	76.44±2.63	<0.001	93.76±1.76	0.989	0.82±0.03	<0.001	5.1±0.7	<0.001
futsch^{K68}/+; wit^{A12}/+	16	92.69±4.27	<0.001	93.11±0.9	1	1±0.05	<0.001	6±0.5	<0.001
futsch^{K68}/+; mad^{273}/+	17	93.53±5.39	<0.001	89.96±1.89	0.999	1.04±0.06	<0.01	7.4±0.8	<0.001

Table S6. Quantification of NMJ parameters for experiments in Figure 6.

Figure 6B

	Number of samples	Vinblastine(VB) treatment	Bouton number	p value vs -VB	p value vs WT	Muscle area (μm^2)X10^{-3}	p value vs -VB	p value vs WT	Bouton number /Muscle area (#/μm^2)X 10^3	p value vs -VB	p value vs WT	Satellite bouton number	p value vs -VB	p value vs WT
w^{1118} (WT)	15	-	119.13±4.06			90.9±0.64			1.31±0.04			13.6±0.6		
w^{1118} (WT)	15	+	121.13±2.04	0.999		90.94±0.64	1		1.330.03	0.999		14.2±0.8	0.999	
spartin^{1}*/Df*	15	-	168±3.95		<0.001	91.02±1.09		1	1.85±0.04		<0.001	23.4±1		<0.001
spartin^{1}*/Df*	15	+	124.2±2.87	<0.001	0.955	91.76±0.85	1	0.999	1.36±0.04	<0.001	0.944	13.8±0.7	<0.001	1
dad^{J1e4}*/dad*^{J1e4}	20	-	158.15±4.68		<0.001	83.04±2.04		<0.01	1.92±0.06		<0.001	24.7±1		<0.001
dad^{J1e4}*/dad*^{J1e4}	20	+	123.05±4.27	<0.001	0.98	80.55±2.12	0.822	<0.001	1.53±0.05	<0.001	<0.01	14.4±1	<0.001	0.991
					p value vs *C155-GAL4/+*			p value vs *C155-GAL4/+*			p value vs *C155-GAL4/+*			p value vs *C155-GAL4/+*
C155-GAL4/+	18	-	123±3.57			91.36±1.85			1.35±0.04			13.1±0.8		
C155-GAL4/+	18	+	126.9±3.33	0.88		98.51±1.22	<0.01		1.29±0.04	0.69		12.7±0.7	1	
C155-GAL4/+; UAS-tkv^{CA}*/+*	18	-	173.3±4.57		<0.001	98.5±1.53		<0.01	1.76±0.04		<0.001	22.3±1.4		<0.001
C155-GAL4/+; UAS-tkv^{CA}*/+*	17	+	135.59±3.27	<0.001	0.094	95.61±1.59	0.566	0.234	1.42±0.03	<0.001	0.605	12.4±0.6	<0.001	0.991

Figure 6D

	Number of samples	Bouton number	p value vs WT	Muscle area (μm^2)X10^{-3}	p value vs WT	Bouton number /Muscle area (#/μm^2)X 10^3	p value vs WT	Satellite bouton number	p value vs WT
w^{1118} (WT)	18	119.33±2.9		89.14±1.35		1.34±0.04		12.7±0.6	
dfmr1$^{\Delta 50M}$*/dfmr1*$^{\Delta 50M}$	17	168.65±4.36	<0.001	84.42±1.26	0.214	2±0.05	<0.001	25.1±1.5	<0.001
spartin^{1}*/+*	18	126.72±1.52	0.789	90.41±1.35	0.995	1.41±0.02	0.958	13±0.6	1
dad^{J1e4}*/+*	18	121.33±2.58	1	89.25±1.62	1	1.37±0.04	1	12.1±0.7	0.999
dfmr1$^{\Delta 50M}$*/+*	20	129.5±4.35	0.408	92.11±1.37	0.714	1.41±0.05	0.929	14±1	0.961
spartin^{1}*,+/+,dfmr1*$^{\Delta 50M}$	20	183.9±4.68	<0.001	91.78±1.1	0.813	2.01±0.06	<0.001	28.2±0.8	<0.001
dfmr1$^{\Delta 50M}$*,+/+,dad*^{J1e4}	18	178.22±3.44	<0.001	91±1.52	0.964	1.96±0.04	<0.001	26.3±1.13	<0.001