

Cain et al., <http://www.jcb.org/cgi/content/full/jcb.201405081/DC1>Table S1. **Strains generated in this study**

Strain	Genotype	Injected plasmid
UD177	<i>unc-84(n369); ycls13[unc-84(Δ556–861) sur-5::GFP]</i>	pSL568
UD305	<i>unc-84(n369); ycEx188[unc-84(Δ895–919) sur-5::GFP]</i>	pSL590
UD343	<i>unc-84(n369); ycEx164[unc-84(Δ783–919) sur-5::GFP]</i>	pSL487
UD380	<i>unc-84(n369); ycEx178[unc-84(Δ861–919) sur-5::GFP]</i>	pSL491
UD389	<i>unc-83(e1408); unc-84(n369); ycEx215[UNC-83/hNesprin-4 UNC-84/hSUN1 p<sub>odr1</sub>::GFP]</i>	pSL549/pSL567
UD420	<i>unc-84(n369); ycEx226[unc-84(Δ861–894) sur-5::GFP]</i>	pSL650
UD421	<i>unc-84(n369); ycEx227[unc-84(Δ910–914) sur-5::GFP]</i>	pSL658
UD422	<i>unc-84(n369); ycEx228[unc-84(Δ900–904) sur-5::GFP]</i>	pSL657
UD423	<i>unc-84(n369); ycEx226[unc-84(Δ861–894) sur-5::GFP]</i>	pSL650
UD424	<i>unc-84(n369); ycEx226[unc-84(Δ861–894) sur-5::GFP]</i>	pSL650
UD427	<i>unc-84(n369); ycEx230[unc-84(Δ915–919) sur-5::GFP]</i>	pSL668
UD446	<i>unc-84(n369); ycEx236[unc-84(Δ895–899) sur-5::GFP]</i>	pSL654
UD459	<i>unc-84(n369); ycEx240[unc-84(Δ905–909) sur-5::GFP]</i>	pSL655
UD460	<i>unc-84(n369); ycEx241[unc-84(Δ915–919) sur-5::GFP]</i>	pSL656
UD461	<i>unc-84(n369); ycEx241[unc-84(Δ915–919) sur-5::GFP]</i>	pSL656
UD462	<i>unc-84(n369); ycEx242[unc-84(Δ783–861) sur-5::GFP]</i>	pSL489
UD464	<i>unc-83(e1408); unc-84(n369); ycEx243[UNC-83/hNesprin-4 UNC-84/hSUN1(Δ616–620) p<sub>odr1</sub>::GFP]</i>	pSL567/pSL577



Video 1. **Wild-type L1 larva locomotion.** A representative video from Fig. 2 G is shown. Wild-type larvae move with smooth, sinusoidal motions. Captured and shown at a frame rate of 16.2 fps for 30 s.



Video 2. ***unc-84(n369)* L1 larva locomotion.** A representative video from Fig. 2 H is shown. *unc-84(n369)* larvae lack the regular motion of the wild type and often twitch and coil. Captured and shown at a frame rate of 16.2 fps for 30 s.