**SUPPLEMENTARY METHODS**

**Drosophila Stocks:**

*Kinesin-lacZ* was a gift from Ira Clark (Clark *et al.* 1994).

**Generation of the *Sema1bKO* allele:**

Arm1 was cloned as a *Not*I/*Nde*I fragment, and Arm2 was cloned using *Sap*1.

Homology arm 1 primers: ACTGATGCGGCCGCCACGTTTCAACGAAGTCTGG & TCAGTACATATGCATTGGGACGCAGTGCA

Homology arm 2 primers: TGATGCTCTTCATATTCCAGGATCCCATTTGCG & CGTAGCTCTTCTGACGCTTCCTATCTTTCGGATGC

The oligos listed below were phosphorylated and annealed according to the protocols on the FlyCRISPR website. The pU6b-BbsI-chiRNA plasmid was cut with *Bbs*I and dephosphorylated, and then ligated with the annealed oligos to generate the two chiRNA plasmids used for CRISPR.

Short inserts were generated by annealing the following primers:

CRISPR1sense: TTCGGCAGAGCAGCACCTCGCCAT

CRISPR1anti: AAACATGGCGAGGTGCTGCTCTGC

CRISPR2sense: TTCGCTGGGCTGCTTAAGTCTCC

CRISPR2anti: AAACGGAGACTTAAGCAGCCCAG