Supplemental material

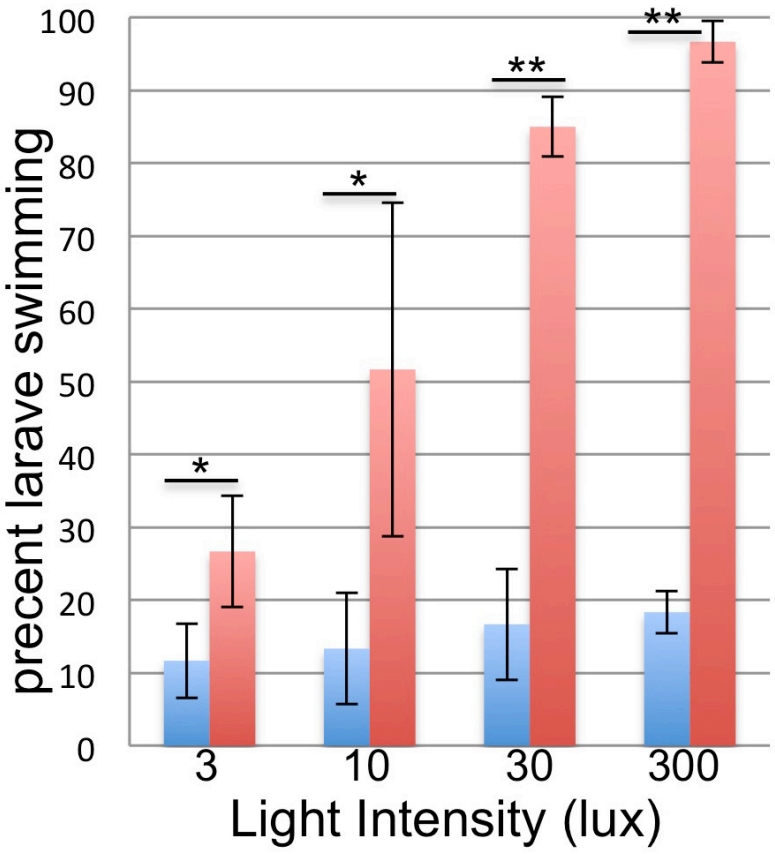

Figure S1. Dimming response of wild type Ciona robusta larvae as a function of light intensity (lux). Blue bars indicate the percentage of larvae swimming in a 5-second period prior to dimming, while red bars indicate percentage of larvae swimming in a 5-second period after dimming. Shown are the averages from three movies with 20 larvae assessed for each movie (± S.D). * P<0.05, **P<0.01.

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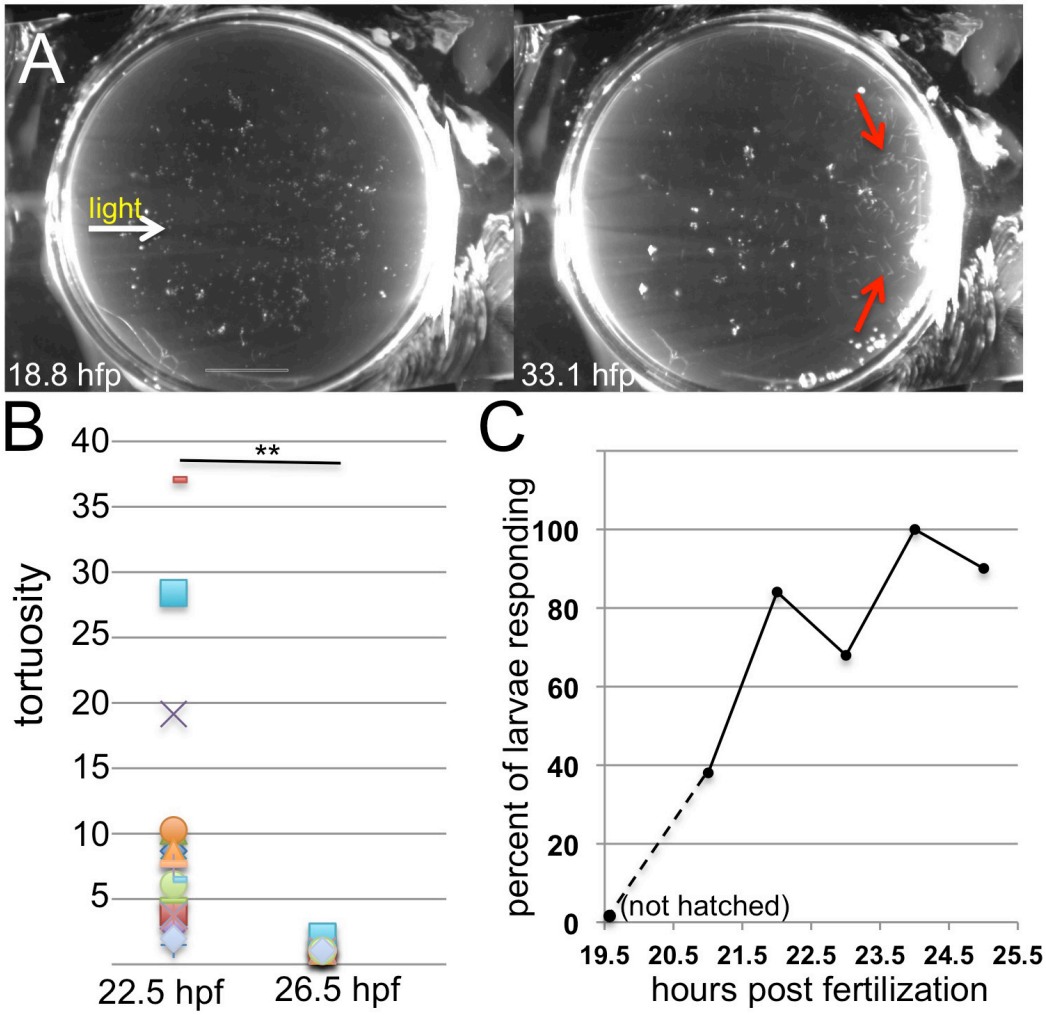

Figure S2. **A**. Negative phototaxis of *Ciona intestinalis* larvae at the beginning and end points of the assay (18.8 and 33.1 hpf). Arrow in left panel indicates the direction of light, and red arrows in right panel indicate accumulation of larvae at the side of the dish away from the light. **B.** Relative tortuosity of swims of *C. intestinalis* larvae in continuous directional light. Developmental times are indicated. **P<0.01 (Wilcoxon signed rank test). **C.** Developmental time course of the dimming response in *C. intestinalis* presented as a percent of larvae responding to dimming light.

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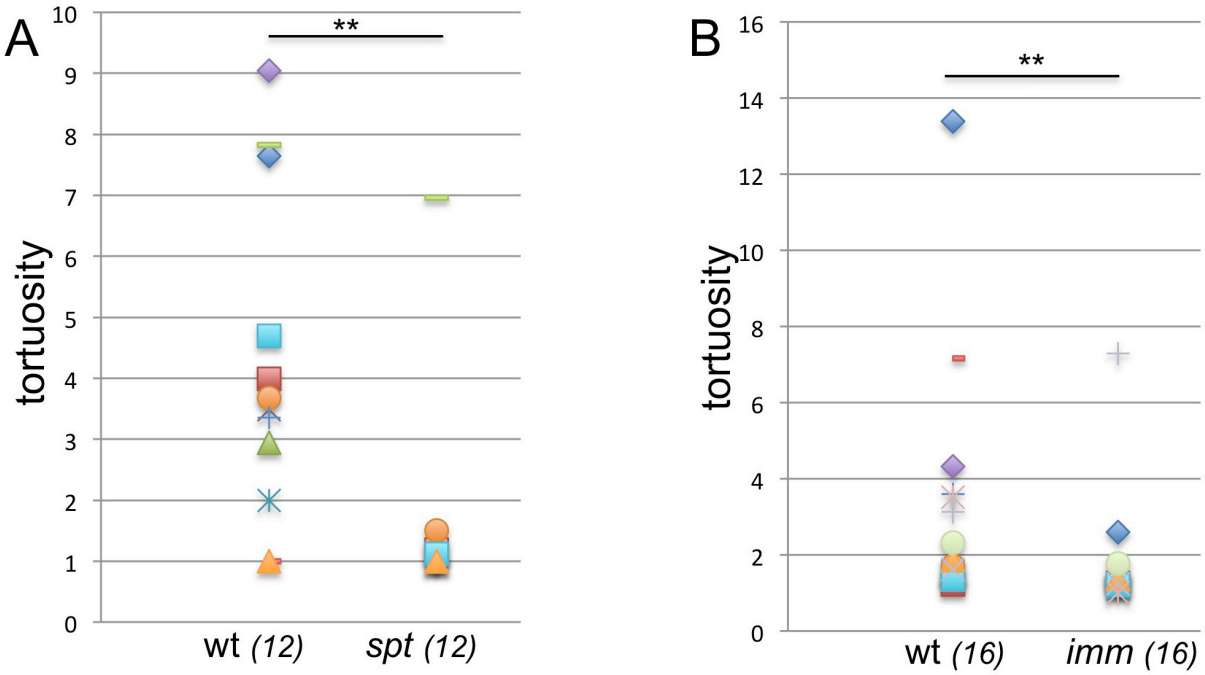

Figure S3. Quantification of swim tortuosity of dimming response swims in *Ciona savignyi* wt and albino larvae. Comparisons of wt to larvae homozygous for the *spotless* (*spt*) **(A)** and to the *immaculate* (*imm*) mutations **(B)**. Number of swims analyzed are in parentheses. **P<0.01 (Wilcoxon signed rank test).

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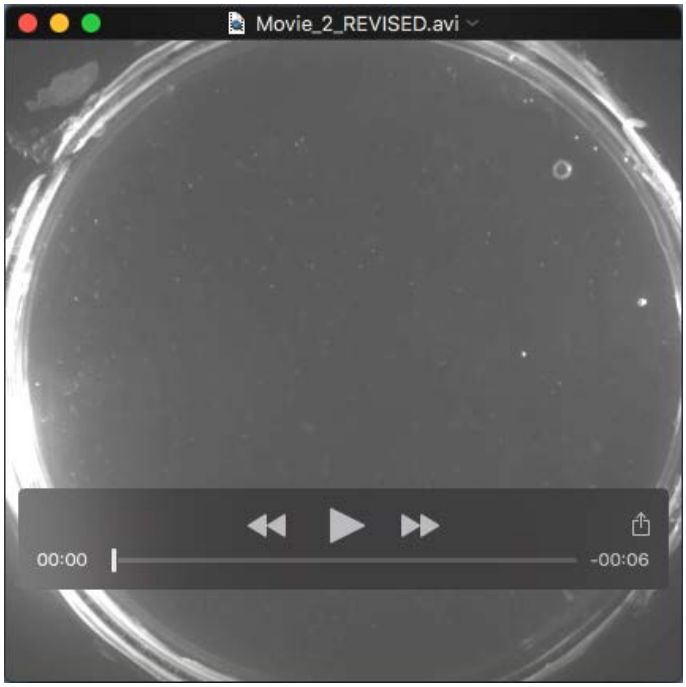
Movie 1. Dimming response of wild type and *pristine* larvae. This thirty second movie, captured at 10 frames per second, is shown at 5-times normal speed. Dimming is evident at the midpoint of the movie. Bar in frame one equals 1 cm.



Movie 2. Negative phototaxis of *C. robusta* larvae. Movie shows an elapsed time of 11.8 hours captured at one frame per 10 minutes. Directional light is from the right.

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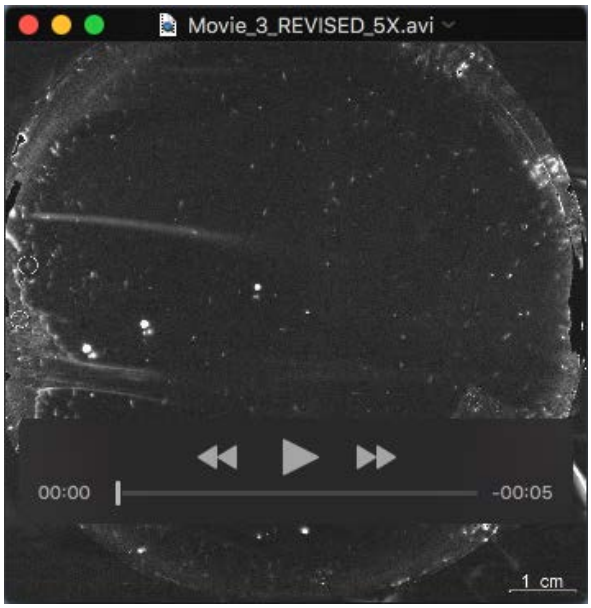
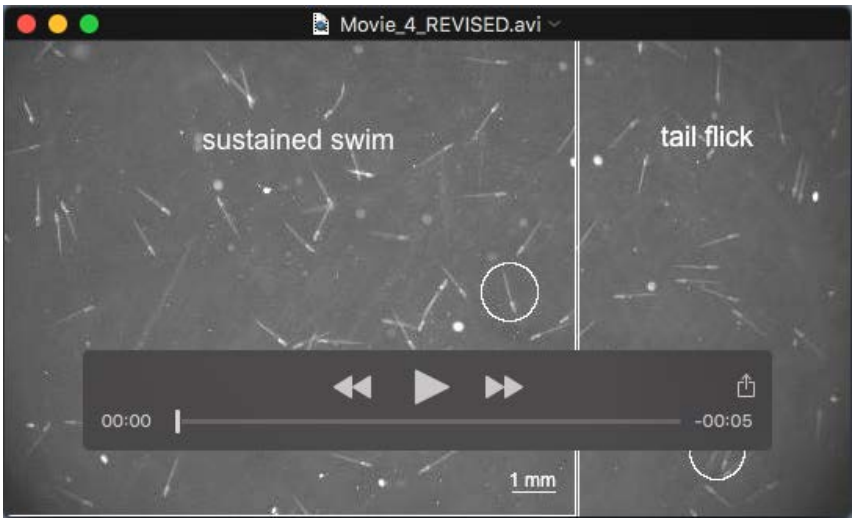


Movie 3. Negative phototaxis of *C. robusta* larvae at 25 hours post fertilization. Circled larvae display sustained negative phototaxic swims. Directional light is from the left. This thirty second movie, captured at 10 frames per second, is shown at 5-times normal speed.



Movie 4. Examples of sustained swims and tail flick. Images captured at 10 frames per second.

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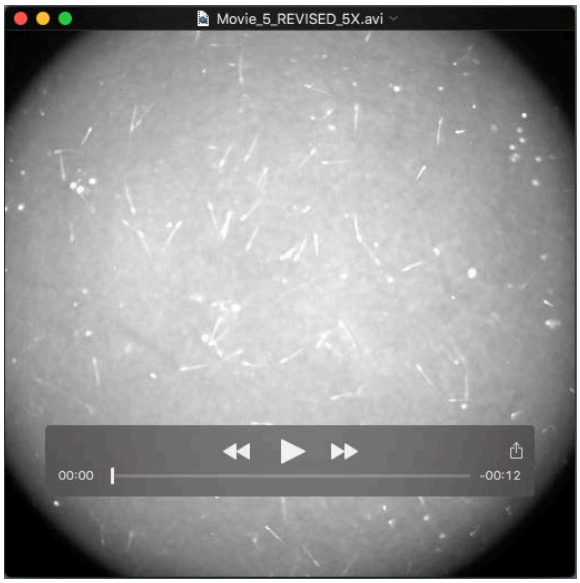

Movie 5. Larvae (~28 hpf) displaying negative phototaxis. Directional light is from the right. Movie is shown at 5 times normal speed.

Movie 6. Response of larvae to dimming of directional light. Light dimming is evident at midpoint of this 30 second movie, shown here at 5 times normal speed. Directional light is from the left.

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Movie 7. Response of swimming larvae to dimming light. Two larvae showing swim-trajectory reversals at light dimming are circled.

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