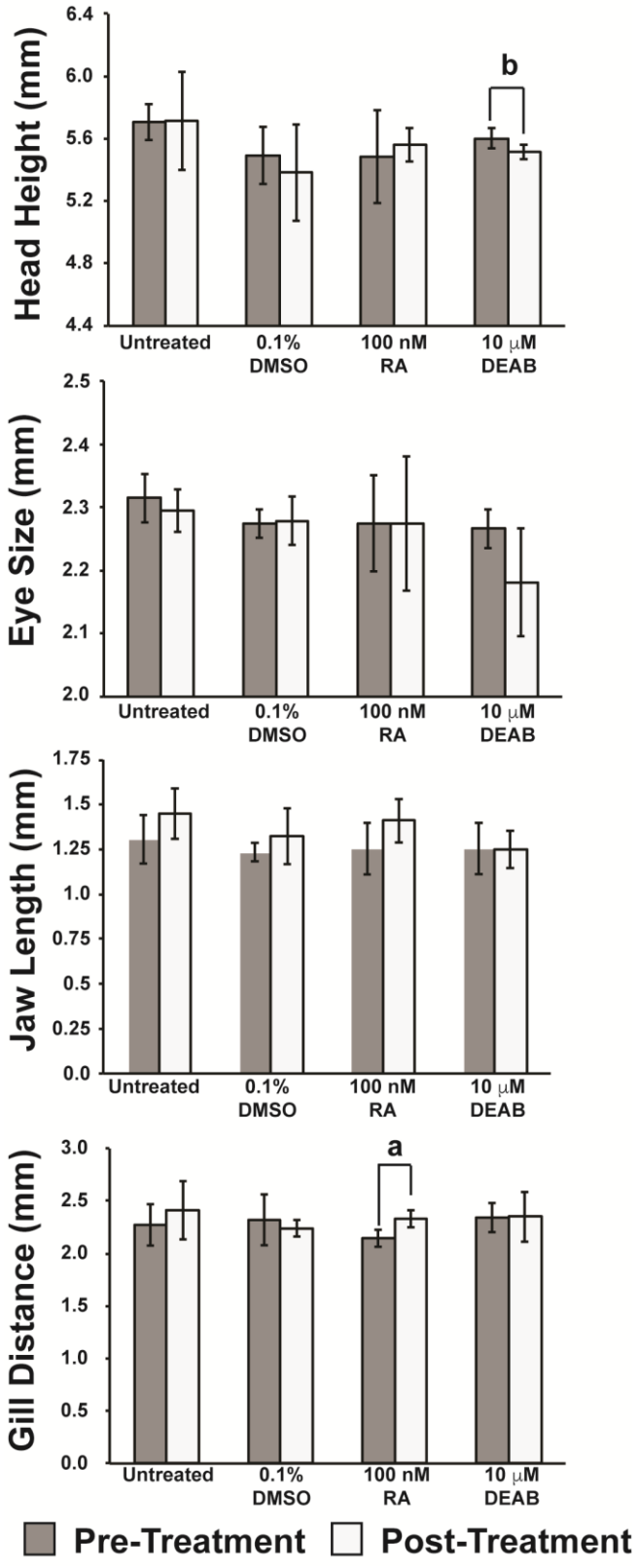
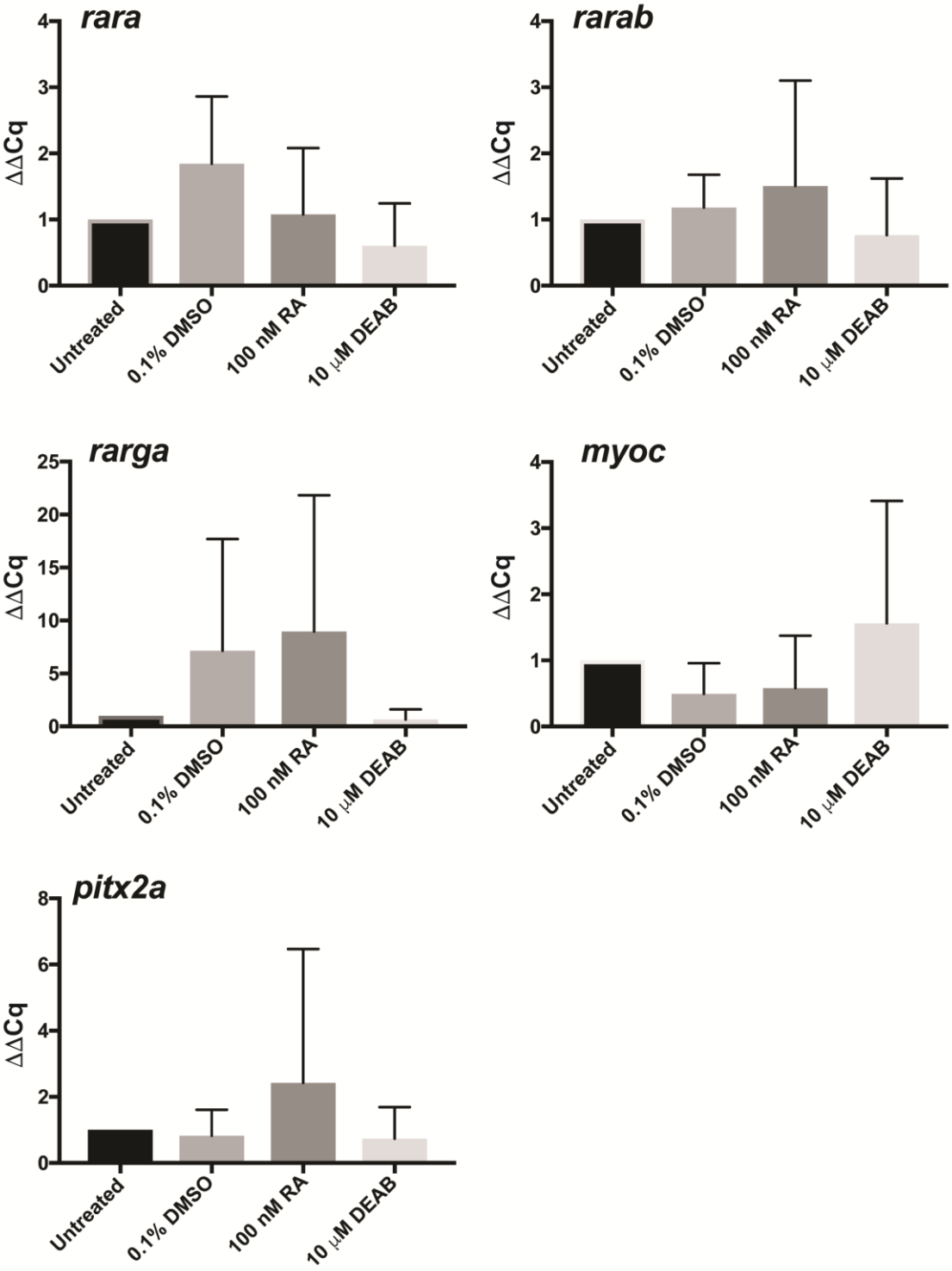
Supplemental Fig. 1



Supplemental Fig. 2



Supplemental Fig. 1: Treatment with RA or DEAB for 5 days changed craniofacial morphology.

Measurements of fish head height, horizontal eye size, jaw length, and distance from the gill to the eye were obtained from fish prior to and following 5 day treatment with DMSO-control, 100 nM RA, or 10 μM DEAB. Treatment with RA significantly (a; $p<0.001$) increased the distance from the gill to the eye (measured from the base of the eye to the gills). DEAB significantly (b; $p<0.02$) decreased the height of the head (measured at the gills).

Supplemental Fig. 2: Alterations in RA did not significantly affect the expression of *rar* genes.

Quantitative RT-PCR of eyes derived from fish treated with 0.1% DMSO, 100 nM RA, or 10 μM DEAB for 2 days demonstrated no significant change in expression of genes encoding RARα (*rara*), RARβ (*rarab)*, RARγ *(rarga).* In addition, RA or DEAB did not affect the expression of *myoc or pitx2a* in the adult eye.

Video 1. Optokinetic reflex in adult fish prior to treatment.

Dorsal view of fish prior to initiation of treatment showed an intact optokinetic reflex that responds accurately to the drum including changes of direction and pauses in movement.

Video 2. Optokinetic reflex in untreated adult fish.

Dorsal view of untreated fish showed that optokinetic reflexes were not disrupted by 5 days of dark conditions and fasting

Video 3. Optokinetic reflex in fish treated with 0.1% DMSO for 5 days

Treatment with 0.1% DMSO for 5 days did not inhibit visual behavior as exhibited by accurate optokinetic reflexes.

Video 4. Optokinetic reflex in fish treated with 100 nM RA for 5 days

Fish treated with 100 nM RA for 5 days showed difficulty in changing direction with the optokinetic drum.

Video 5. Optokinetic reflex in fish treated with 10 μM DEAB

Treatment with 10 μM DEAB for 5 days caused loss of visual function as the eyes did not track the optokinetic drum.

Video 6. *In vivo* aqueous outflow assay in untreated adult fish.

Time-lapse movie of images taken every 20 seconds for 15 min following injection of Texas Red fluorescent dye in untreated adult zebrafish showed that the dye diffused throughout the anterior chamber and migrated clockwise and counter-clockwise towards the ventral iridocorneal angle.

Video 7. *In vivo* aqueous outflow assay in fish treated with 0.1% DMSO for 2 days

Time-lapse movie of images taken every 20 seconds for 15 min following injection of Texas Red fluorescent dye in an adult zebrafish treated with 0.1% DMSO for 2 days showed similar aqueous outflow pattern as untreated fish. The injected dye diffused throughout the anterior chamber and migrated clockwise and counter-clockwise towards the ventral iridocorneal angle.

Video 8. *In vivo* aqueous outflow assay in fish treated with 100 nM RA for 2 days

Time-lapse movie of images taken every 20 seconds for 15 min following injection of Texas Red fluorescent dye in an adult zebrafish treated with 100 nM RA for 2 days showed that the dye did not flow out of the anterior chamber. The injected dye initially dispersed around the site of injection, but subsequently did not diffuse throughout the anterior chamber nor migrate towards the ventral iridocorneal angle.

Video 9. *In vivo* aqueous outflow assay in fish treated with 10 μM DEAB for 2 days

Time-lapse movie of images taken every 20 seconds for 15 min following injection of Texas Red fluorescent dye in an adult zebrafish treated with 10 μM DEAB for 2 days showed that the dye did not flow out of the anterior chamber. The injected dye initially dispersed around the site of injection, but subsequently

did not diffuse throughout the anterior chamber nor migrate towards the ventral iridocorneal angle.