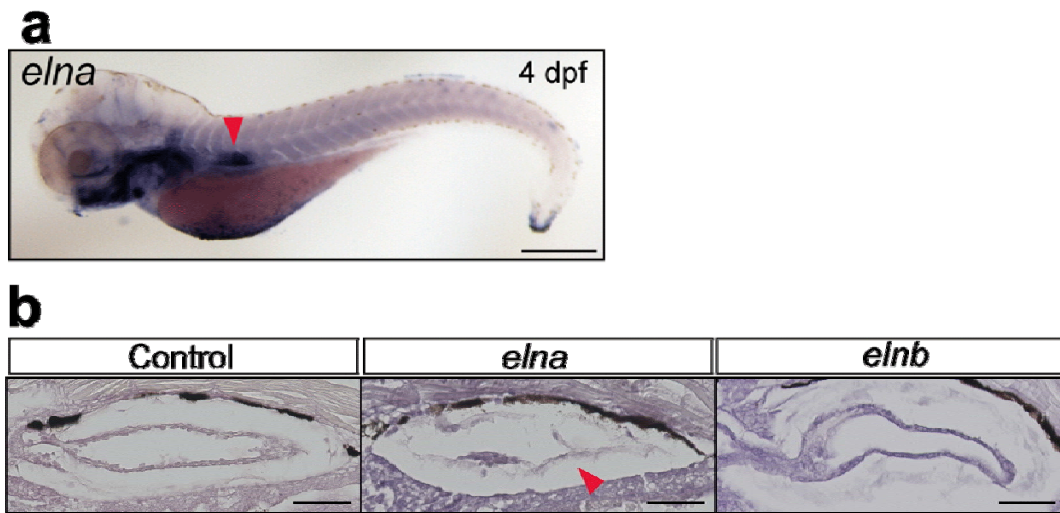
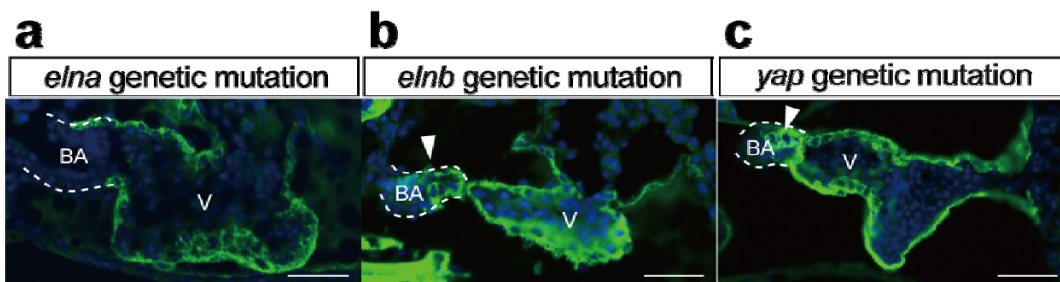


Supplementary Figure 1 | Expression pattern of *eln* in *Polypterus* embryos. Expression pattern of *eln* in 3 (a-d), 5 (e-h) dpf and hatching stage (i-l) embryos from lateral (a, e, i), dorsal (b, f, j) and frontal (c, g, k) view. Scale bars, 500 μ m. (d, h, l) Sagittal section of *in situ* hybridization embryos. Arrowheads indicate hearts. Dashed line depicts outline of heart tubes. Scale bars, 300 μ m.



Supplementary Figure 2 | Expression pattern of *elna* in zebrafish 4 dpf embryos.

(a) Expression pattern of *elna* in 4 dpf embryos. Arrowhead indicates *elna* expression in swimbladder. Scale bar, 400 μ m. (b) Swimbladder morphologies in control, *elna* morphant and *elnb* morphant embryos. Arrowhead indicates swimbladder defect in *elna* morphants. Scale bars, 50 μ m.

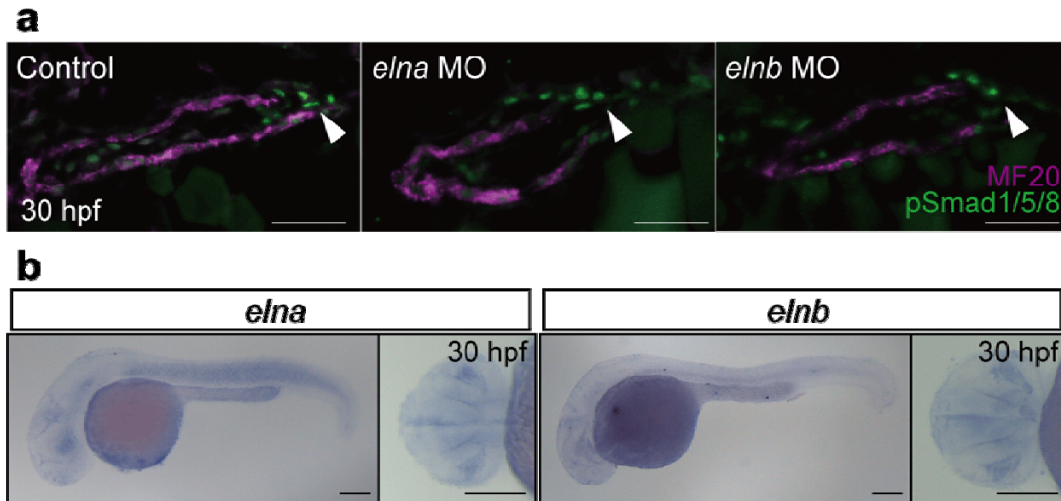


Supplementary Figure 3 | BA morphology in *elna*, *elnb* and *yap* genetic mutants.

BA morphology in *elna* (a), *elnb* (b) and *yap* (c) genetic mutants. Arrowheads indicate ectopic cardiomyocytes in BA. BA, bulbus arteriosus; V, ventricle. Scale bars, 50 μ m.



Supplementary Figure 4 | Expression pattern of *ltbp3* in zebrafish embryos. Expression patterns of *ltbp3* in 3 (**a, b**) and 4 (**c, d**) dpf embryos. Arrowheads indicate *ltbp3* expression in BA. Scale bars, 200 μ m.



Supplementary Figure 5 | Phosphorylation level of Smad1/5/8 and expression pattern of *elna* and *elnb* in 30 hpf zebrafish embryos. (a) Phosphorylation levels of Smad1/5/8 at 30 hpf in control, *elna* morphants and *elnb* morphants. pSmad1/5/8 at arterial pole (arrowheads) are not changed in *elna* and *elnb* morphants. Scale bars, 50 μ m. (b) Expression pattern of *elna* and *elnb* in 30 hpf embryos. *elna* and *elnb* are not expressed in the heart at 30 hpf. Scale bars, 200 μ m.