

## Description of Additional Supplementary Files

**Supplementary Movie 1.** Time-lapse imaging of wild-type Tg(*tg:GFP*) embryo. GFP labels the thyroid. The live imaging was started at 56 hpf and covered 16 h. Ventral view, anterior to the left.

**Supplementary Movie 2.** Time-lapse imaging of *hgfa* mutant Tg(*tg:GFP*) embryo. GFP labels the thyroid. The live imaging was started at 56 hpf and covered 16 h. Ventral view, anterior to the left.

**Supplementary Movie 3.** Time-lapse imaging of met mutant Tg(*tg:GFP*) embryo. GFP labels the thyroid. The live imaging was started at 56 hpf and covered 16 h. Ventral view, anterior to the left.

**Supplementary Movie 4.** Time-lapse imaging of a U0126-treated Tg(*flk1:GFP;tg:mCherry*) embryo. GFP labels vascular and mCherry labels thyroid. The live imaging was started at 60 hpf and covered 12 h. Ventral view, anterior to the left. Thyroid primordium in the U0126-treated embryos failed to caudally expand along the pharyngeal midline during the late stage of thyroid development from 60 hpf to 72 hpf.