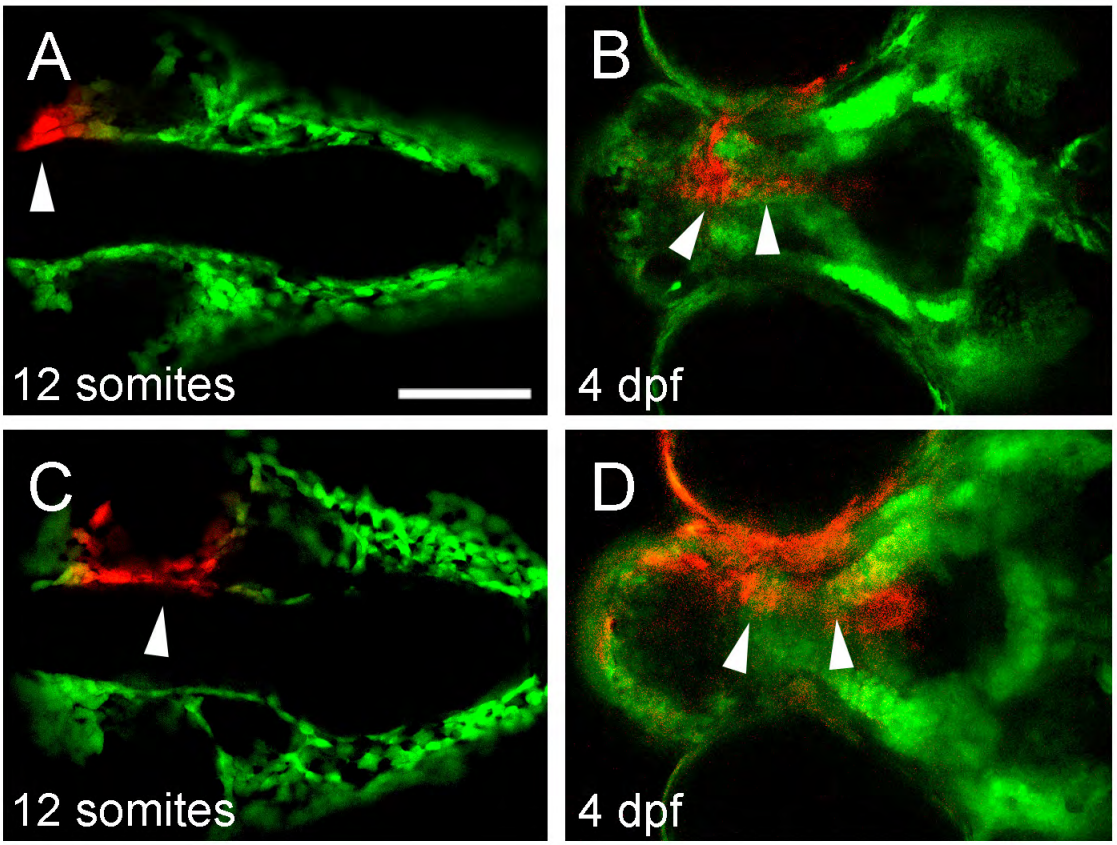


**Fig. S1. Lineage analysis of cranial neural crest in *wnt9a* morphant.** (**A-D**) CNCCs anterior to the eye, which are destined to form the median ethmoid plate (arrow, A), still migrate to the median region of the dysmorphic and foreshortened ethmoid plate (arrows, B), whereas cells medial to the eye, which are destined to form the lateral ethmoid plate (arrow, C) also reach their destination at 4.5 dpf (arrows, D), indicating that the shortened ethmoid plate is not a result of failure of early CNCC migration. Scale bar: 50 μm.

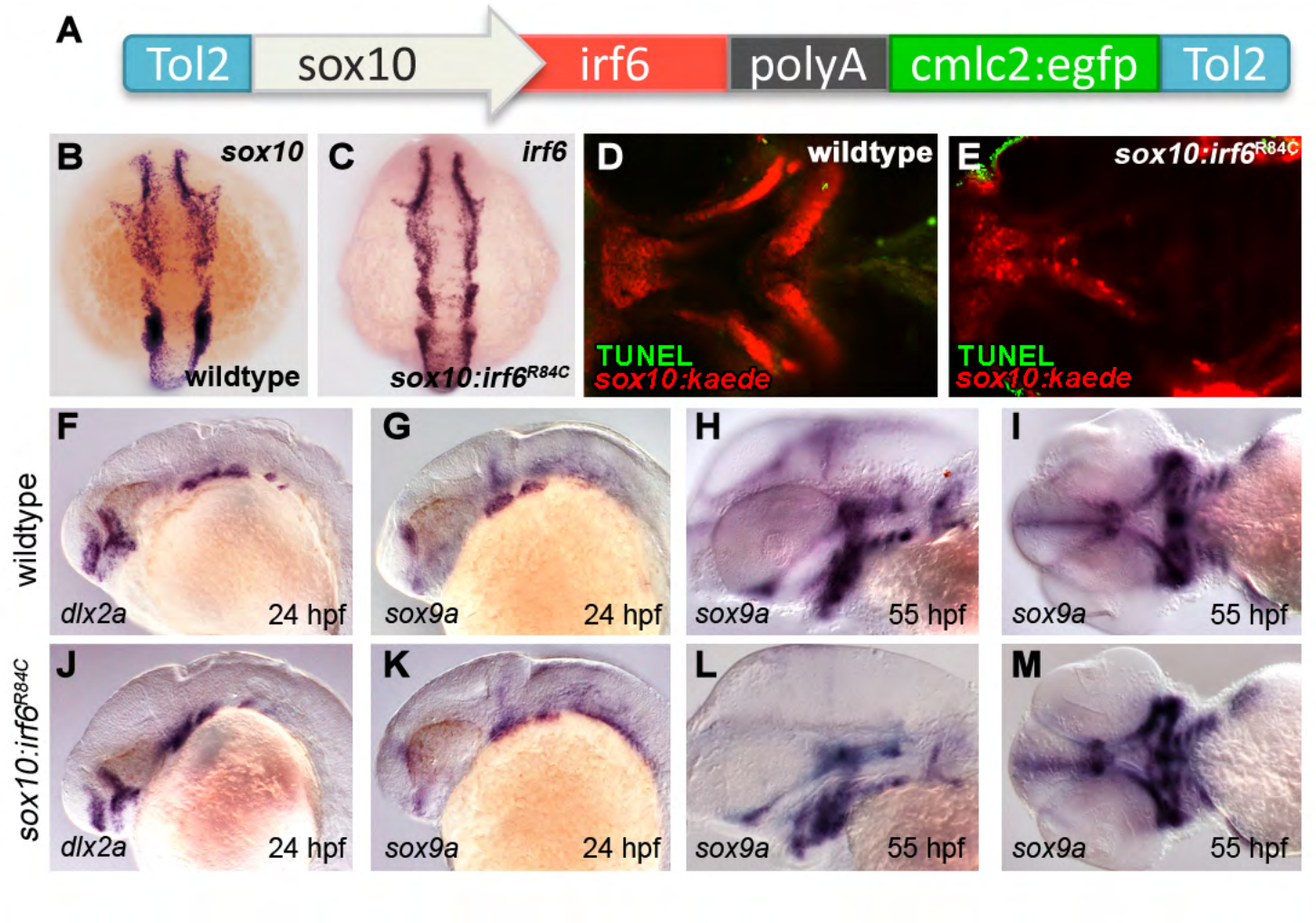


**Fig. S2. Characterization of *sox10:irf6*$^{R84C}$ transgenics.** (**A**) Transgene contains mutant *irf6* (R84C, R84H, or R84K) under the control of the *sox10* promoter, followed by a fluorescent tag (*cmlc2:egfp*) to facilitate screening. (**B**,**C**) Expression pattern of exogenous *irf6* matches that of *sox10* at 10 somites. (**D**,**E**) TUNEL assay for apoptosis confirms that clefting in *sox10:*$^{irf6R84C}$ is not a result of cell death. (**F**,**G**,**J**,**K**) Expression analysis of neural crest markers *dlx2a* and *sox9a* show that early neural crest development is not significantly affected in the *irf6* mutant. (**F**,**J**) At 24 hpf, the expression pattern of *dlx2a* is unaffected in the developing pharyngeal arches. (**G**,**K**) Similarly, pharyngeal arch expression of *sox9a* is similar in wild-type and mutant embryos. (**H**,**I**,**L**,**M**) By 55 hpf, although the head is already noticeably smaller in mutants, patterning of *sox9a* is similar, highlighting the developing ethmoid plate, mandible, ceratohyal and ceratobranchials.