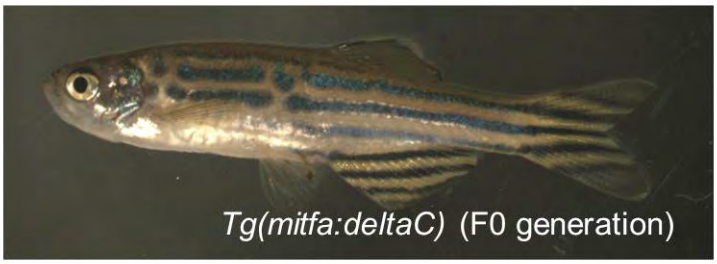

Fig. S1. Summary of our previous studies. (A) A transient loss of a large number of xanthophores leads to the death of melanophores. Melanophores adjacent to xanthophores died but so too did melanophores originally at a distance from xanthophores. **(B)** When a single melanophore or xanthophore is surrounded by the other cell type, it dies in a few days. **(C)** Interaction network suggested from the experiments

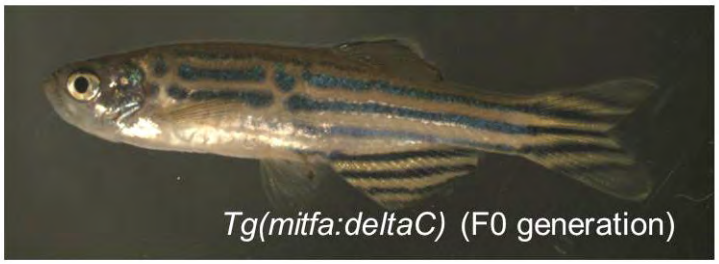

Fig. S2. Pattern change observed during primary screening of candidate genes. 2/15 F0 fish mosaic for the *mitfa:deltaC* transgene showed abnormal pigment patterns. No transgenic fish for other candidate gene exhibited such stripe abnormalities. Presence of the transgene was confirmed by genomic PCR.

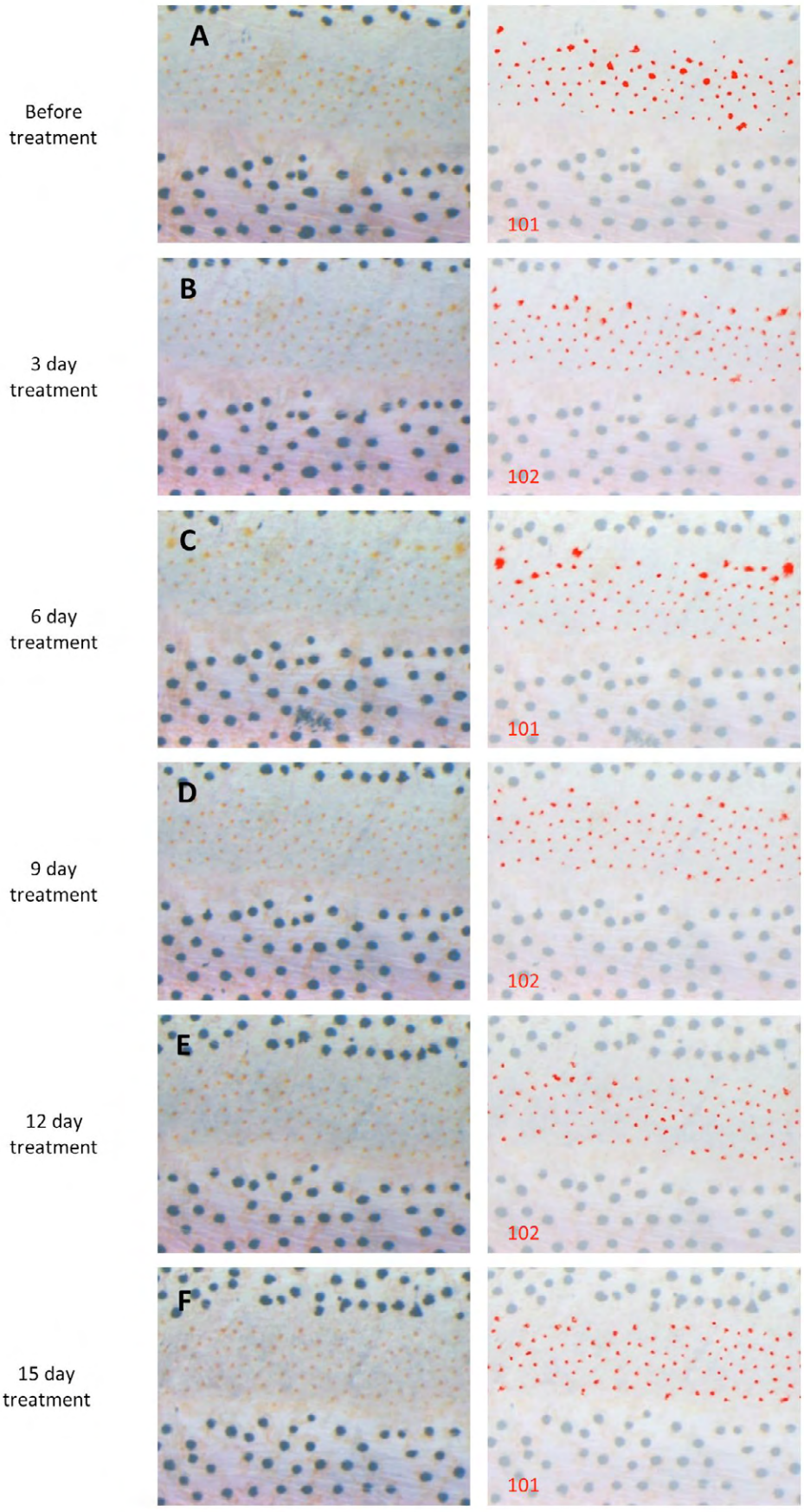

Fig. S3. Xanthophores were not affected by DAPT treatment. (A-F) Left panels are original images. In right panels, xanthophores we counted are marked by red overlay. The number of xanthophores is shown at the bottom-left of each panel. Scale bar: 500 μm.

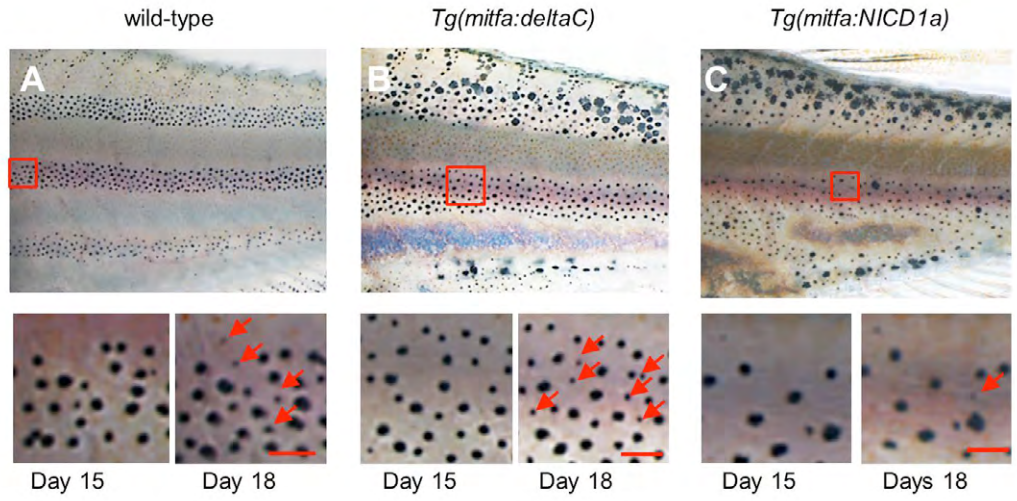

Fig. S4. Recovery of melanophores after the removal of DAPT. (A-C) After 15 day DAPT treatment, fish were moved to normal water. To assess the recovery, melanophore distributions were compared between day 15 and day 18. Red arrows show newly differentiated melanophores. In wild-type and *Tg(mitfa:deltaC)* transgenic fish, new melanophores developed rapidly, whereas no changes were observed for *Tg(mitfa:NICD1a*) transgenic fish. Scale bars: 100μm.

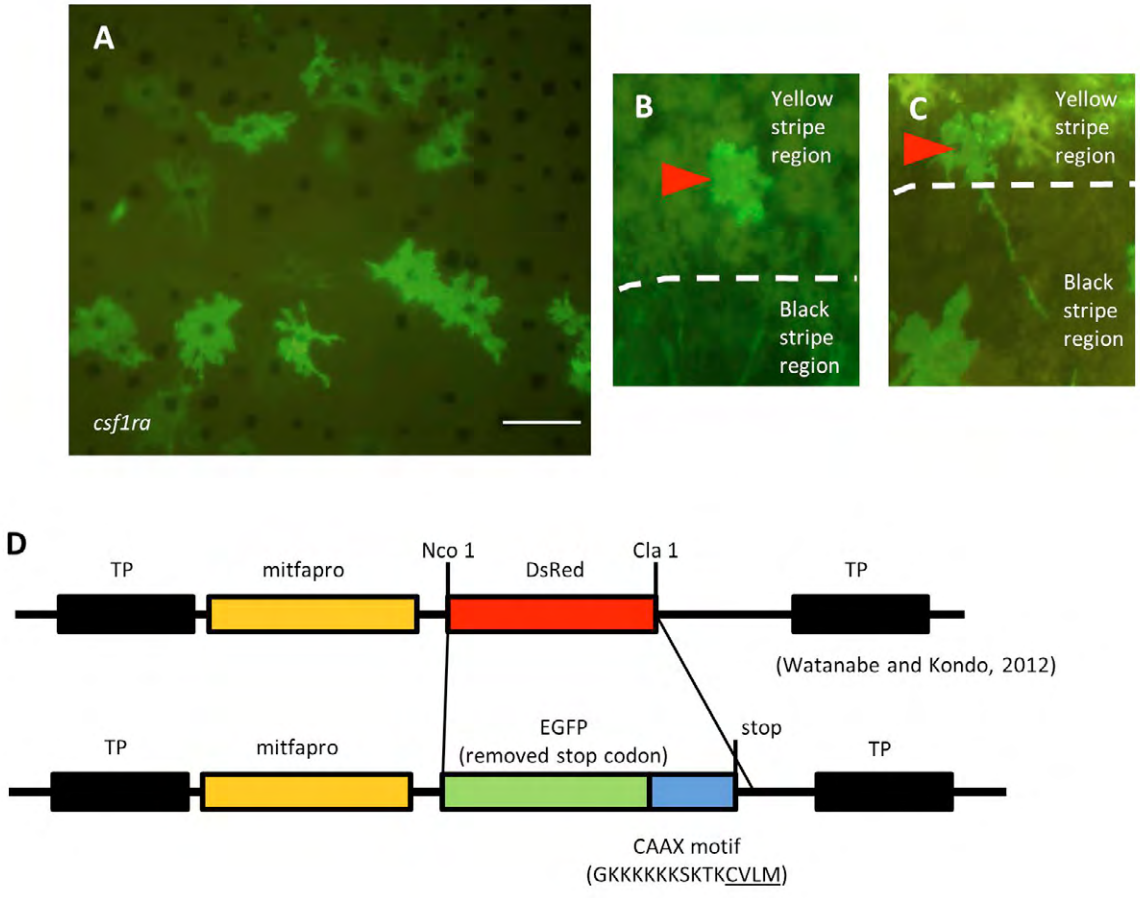

Fig. S5. Projections in melanophores in *csf1ra* mutant and xanthophores in wild-type. (**A**) Long projections of melanophores were rarely observed in csf1ra mutant, which lacks xanthophores. (**B, C**) As there is a leak expression of Mitfa promoter in F0 fish, xanthophore membrane is also visible with the same construct. Most of xanthophores do not have long projections in wild type fish(B). We rarely found xanthophores with long projection(C). (**D**) Design of plasmid for the EGFP-CAAX. Upper line indicated the plasmid which used in (Watanabe and Kondo, 2012). Lower line indicated the plasmid which used in this study.

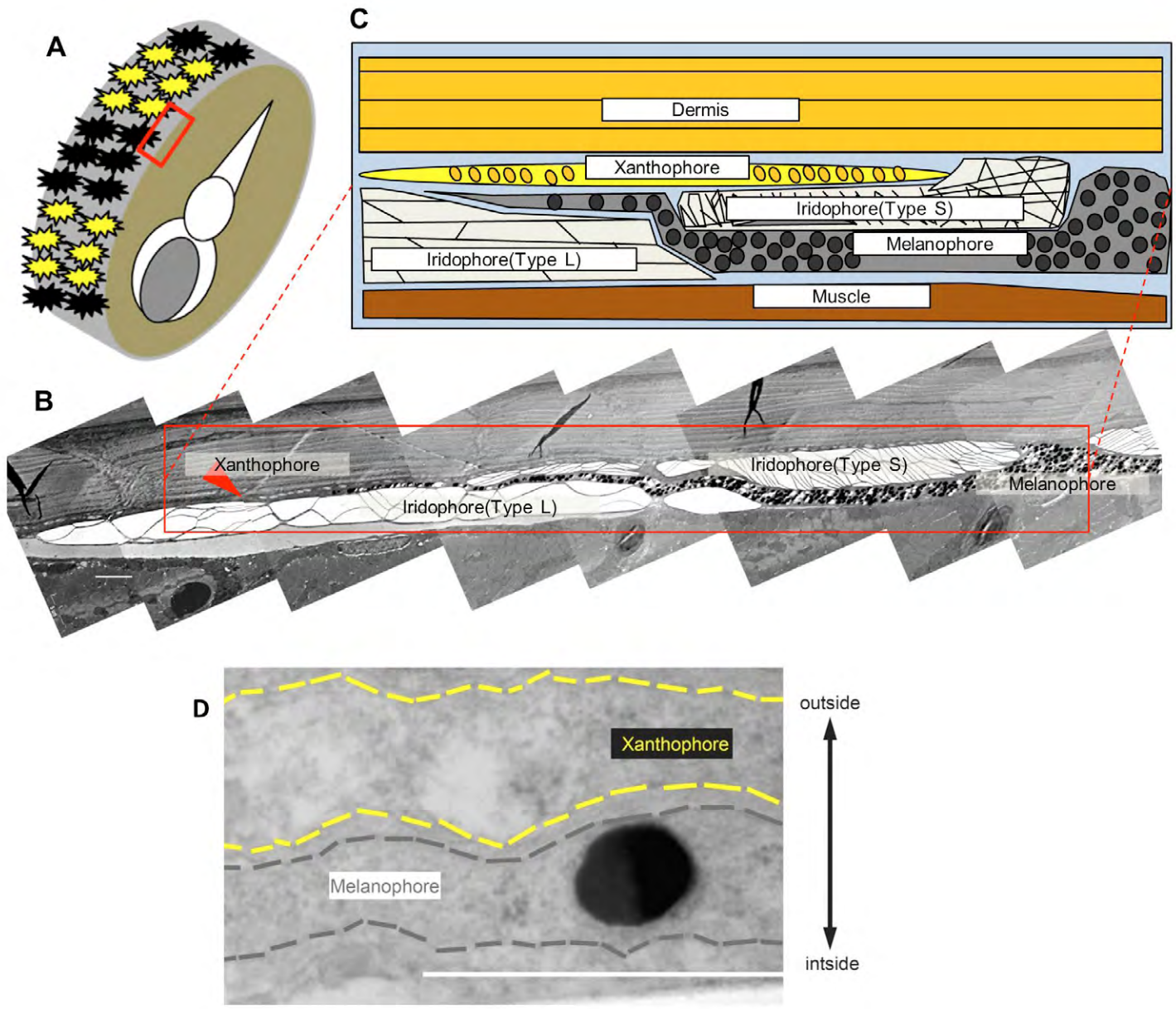

Fig. S6. Electron microscopy of zebrafish skin showing the direct contact between melanophores and xanthophores. (A) Region of the skin examined by transmission electron microscopy (red square). **(B)** Low magnification image showing different pigment cell classes. **(C)** Schematic rendering of boxed region in (B). **(D)** Magnified image of melanophore projection tip in other sample. In the previous report of electron microscopy analysis, we showed that melanophores and xanthophores are generally separated by the insertion of iridophores (Hirata et al., 2003). We found, however, that melanophore membrane (black dashed line) and xanthophore membrane (yellow dashed line) were close proximity to one another at the stripe boundary. Scale bar = 5μm in B, 1μm in D.

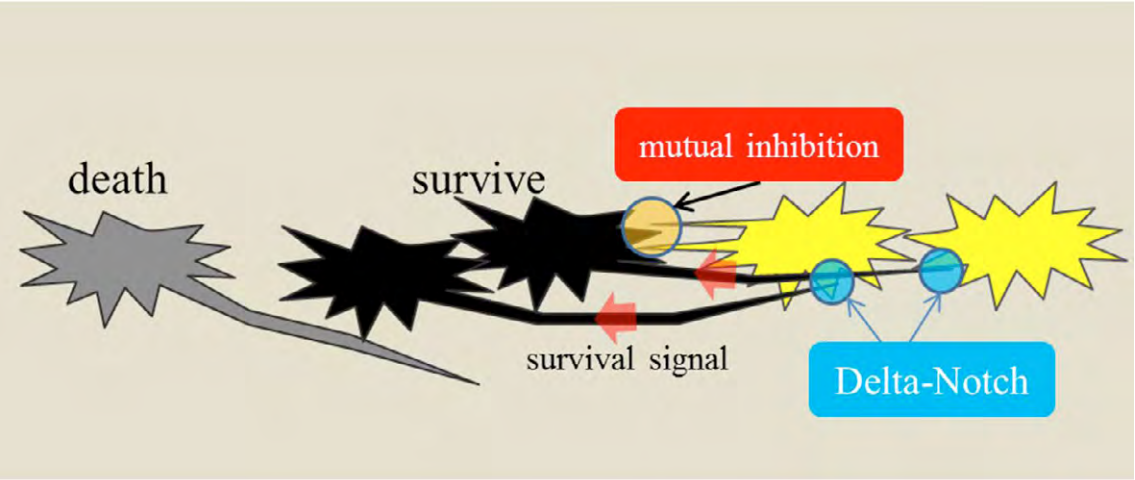

Fig. S7. Interactions between two kinds of pigment cells. Our studies have shown that there are two interactions, short-range and long-range, between melanophores and xanthophores. Short-range interactions result in mutual inhibition and depend on Kcnj13 (formerly Kir7.1). Long-range interactions transmit a survival signal, involving Delta-Notch, from xanthophores to melanophores. The effective range of this Delta-Notch signal may contribute to determining the width of black stripes.

Table S1. Primer sets and parameter for RT-PCR. All RT-PCR were performed 45cycles for Notch receptors, and 40 cycles for DSL family at 95°C for 30 s, 60°C for 30 s, and 72°C for 30 s.

Gene name		Primer set	Cycle number
dct	F	ATCAGCCCGCGTTCACGGTT	45 for Fig. 1C 40 for Fig.1D
	R	ACACCGAGGTGTCCAGCTCTCC	
aox3	F	AGGGCATTGGAGAACCCCCAGT	45 for Fig. 1C 40 for Fig.1D
	R	ACACGTTGATGGCCCACGGT	
notch1a	F	GTCTGCTGGAGTCGTGCGCC	40
	R	ACAGCAGCCGCCCAGTGAAG	
notch1b	F	ACCAGACAGACCGCACGGGT	40
	R	ATGCCCTCGACCGCCAGTCT	
notch2	F	CTGCACTGGGCTGCTGCTGT	40
	R	TCCAGGACGCATGCCGAGGA	
notch3	F	CAGGCCGTGAGACGCGCATT	40
	R	GCTGTGTTCACGCTTGCGGC	
deltaA	F	CGGCATCCACGTCGGCTTGT	45
	R	GCCTACAGGCCACCACTGCC	
deltaB	F	CTGCCGGCCGGGATTTGGAG	45
	R	GTCGGTGGGCATCGGCAGAC	
deltaC	F	GACCGGTGCAGCAGTGACCC	45
	R	TGTGCCCATGAAGCCTGCCG	
deltaD	F	AGCGACGGCGACAAAAACGGA	45
	R	TGTGGCGTTACACCTCGGTTGC	
delta-like4	F	AGTGTGACAGCAGCCCACGC	45
	R	CTGGCCAGTGAAGCCCGCTC	
β-actin	F	CGGTTTTGCTGGAGATGATG	45 for Fig. 1C 40 for Fig.1D
	R	CGTGCTCAATGGGGTATTTG	