Supplementary File 5: Full description of all the cell-cell interaction given in main text. All interactions are referenced in Appendix 1. Melanocytes, xanthophores, loose iridophores, dense iridophores and xanthoblasts are denoted M, X, I^l, I^d, X^b respectively. C1, C2 stands for cell 1, cell 2, where $C1 = X$, X^b is the target cell and cell 2 is the signalling cell with corresponding signal range (R) that is either short (S), up to 0.04mm, or long (L), 0.12mm. This signal generates action (A) of cell type C1 of: movement (M), differentiation (D), proliferation (P) or survival (S) of type (T). For action (D) or (S), type (T) is denoted '+' if the resultant action is promotion of action A and '-' if the resultant action is inhibition of action (A). For action (M), type (T) is denoted '+' if the resultant action is attraction towards cell type C1 and '-' if the resultant action is repulsion away from cell type C1. *Melanocytes can also differentiate randomly, independent of any other cell type.

C1	**C2**	**A**	**R**	**T**	**Basis of assumption**	**Details**	**Ref.**
I^l	I^l	M	S	-	Adult *pfe*, *shd*, *nac* and WT fish.	I^l are typically spaced at a distance from each other.	[1]
X	I^d	M	S	+	WT fish development.	Arrival of I^d leads to compaction of X overlaying this region.	[2]
I^d	X	M	S	+	Adult *pfe*, *shd*, *nac* and WT fish.	X and I^d are highly associated with each other.	[1]
M	I^d	M	S	-	Long term imaging of WT fish	M appear to migrate to dense I^d free zones.	[3]
I^d	M	M	S	-	Adult *pfe*, *shd*, *nac* and WT fish.	I^d are typically not associated with M.	[1]
X	M	M	S	+	Cultured WT M and X.	*In vitro*, X extended pseudopodia towards M which they then followed towards M.	[4]
M	X	M	S	-	Regeneration experiments performed *in vivo* on WT fish	When X in close proximity to M in the pale interstripes, M move out of interstripe, versus when the X in close proximity to M are ablated. Then M are less likely to leave the interstripe region.	[5]
M	X^b	M	L	+	Long term imaging of WT fish	X^b in stripes exhibit airinemes which attach to M activating Delta-Notch signalling and resulting in the consolidation of M into stripes.	[6, 7]
I^d	M	D	S	-	Observations of WT fish.	M typically differentiate in I^d free zones.	[3]
I^d	M	D	L	+	Observations of *pfe* mutants and WT	M differentiation is associated with one stripe width distance away from the central strip of I^d.	[1]
X	M	D	S	-	Regeneration experiments *in vivo* on WT fish.	M and X compete to differentiate in the S range.	[4]
X	M	S	L	+	Regeneration experiments *in vivo* on WT fish.	Increased M death when X ablated from neighbouring pale interstripes.	[4, 8]
X	M	S	S	-	Regeneration experiments *in vivo* on WT fish.	When X in close proximity to M, some M die versus when X in close proximity to M are ablated, no M die.	[5, 9]
X	M	D	L	+	Regeneration experiments *in vivo* on WT fish.	M regeneration proportional to neighbouring pale interstripe X number.	[4, 8]

C1	C2	A	R	T	Basis of assumption	Details	Ref.
M	M	D	L	-	Regeneration experiments *in vivo* on WT fish.	M regeneration negatively proportional to M at half a stripe width distance.	[4]
M	M	S	L	-	Regeneration experiments *in vivo* on WT fish.	M regeneration negatively proportional to M at half a stripe width distance (when X ablated from neighbouring inter-stripes).	[4]
I^l	M	S	S	+	Observations of *pfe* fish.	We predict that loose S-iridophores promote M survival as this would account for the aggregates of Ms observed in *pfe*.	[10, 1]
*	M	D			Observation of double mutant *nac;pfe* fish.	*nac;pfe* are unable to generate Xs or iridophores, yet readily generate M.	[1]
X^b	I^d	D	S	+	S-iridophore expression studies.	I^d express xanthogenic Colony stimulating factor-1 (Csf1) which is essential for X^b differentiation.	[3, 1, 11]
X^b	X	P	S	+	Regeneration experiments *in vivo* on WT fish.	M and X compete to differentiate in the short range.	[4]
X^b	M	D	S	-	Regeneration experiments *in vivo* on WT fish.	M and X compete to differentiate in the short range.	[4]
X	I^d	P	S	+	S-iridophore expression studies.	I^d express xanthogenic Colony stimulating factor-1 (Csf1) which is essential for X proliferation and survival.	[3, 1, 11]
X	M	P	S	-	Regeneration experiments *in vivo* on WT fish.	M and X compete to differentiate in the short range.	[4]
X	X	P	S	+	Regeneration experiments *in vivo* on WT fish.	M and X compete to differentiate in the short range.	[4]
X		P			Clonal analyses of X lineage.	X and X^b observed to proliferate at a rate of approximately 1/week.	[2]
X^b.		P			Clonal analyses of X lineage.	X and X^b observed to proliferate at a rate of approximately 1/week.	[2]

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