

Modeling the formation of stripes in zebrafish

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Abstract: Zebrafish is a small fish with distinctive black and yellow stripes that form due to the interaction of different pigment cells. We present an agent-based model for these stripes that is able to describe the full spectrum of experimental data: development from a larval pre-pattern, regeneration after laser ablation, and mutations. We find that fish growth shortens the necessary scale for long-range interactions and that local repulsion between cells maintains stripe boundary integrity.