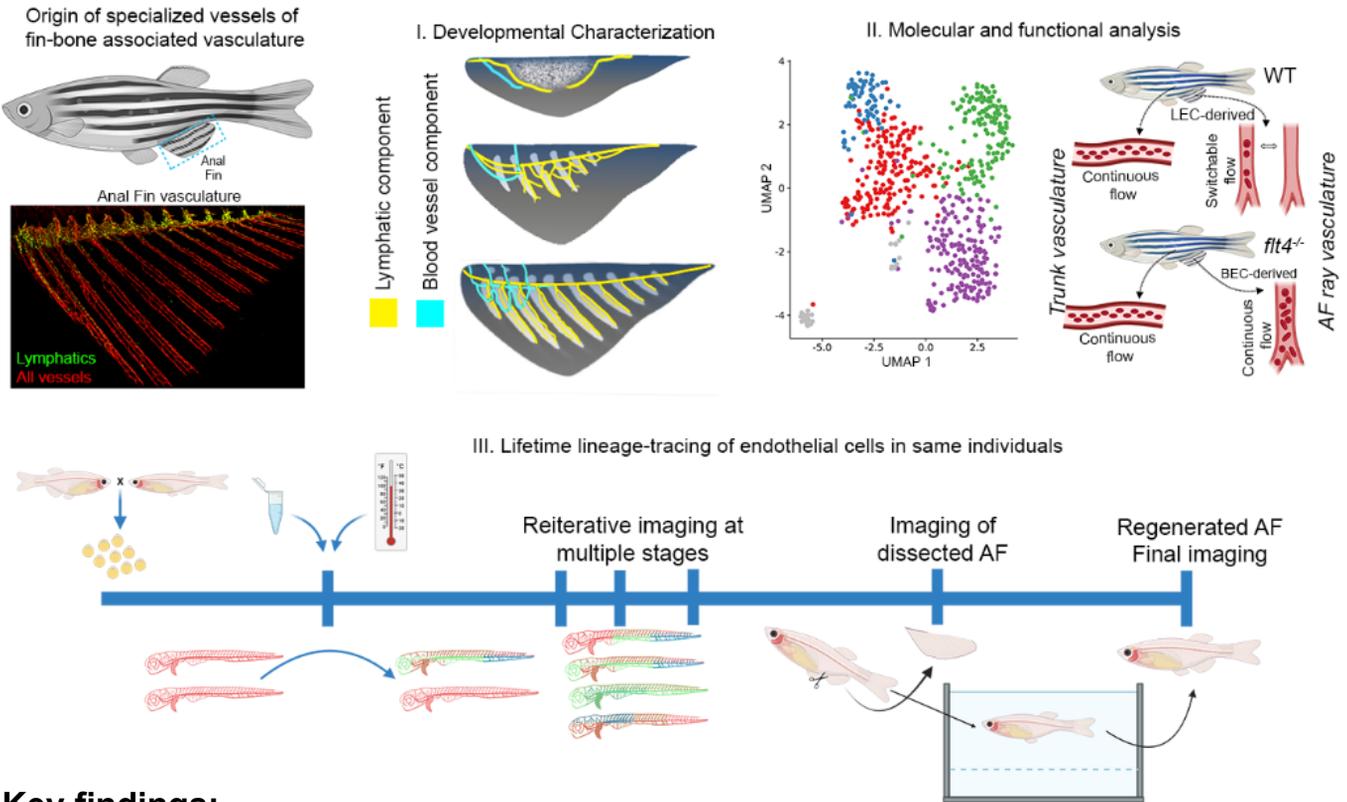


Generation of specialized blood vessels via lymphatic transdifferentiation.

Das RN, Tevet Y, Safriel S, Han Y, Moshe N, Lambiase G, Bassi I, Nicenboim J, Brückner M, Hirsch D, Eilam-Altstadter R, Herzog W, Avraham R, Poss KD and Yaniv K.

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Key findings:

- I. The anal fin (AF) is a unique organ that forms in fish during the larva-to-juvenile transition (metamorphosis). During its initial development and growth it features a striking lymphatic over blood vessel coverage. Through a combination of lineage tracing and high resolution imaging, Das et al demonstrate that the blood vessels of the fin are generated via transdifferentiation of the initial lymphatic plexus.
- II. Molecular characterization through scRNA-seq revealed a population of transdifferentiating ECs displaying low levels of lymphatic and blood vessel markers, but are enriched with markers for chromatin and nucleosome remodeling.
- III. Functional analyses revealed these lymphatic-derived blood vessels to have unique flow properties, previously associated with Secondary Vessels- a specialized blood vessel type described in fish fins, displaying intermittent red blood cell content. These properties are lost when the AF is vascularized by blood vessel sprouts in *flt4*^{-/-} fish that lack trunk lymphatics.
- IV. ‘Lifetime’ lineage-tracing of same individuals from larval to adult stages, and in regenerated AFs, revealed that the ability for lymphatic endothelial cells to generate this specialized blood vasculature is retained in the mature animal, and the process is recapitulated during fin regeneration.