

**Project Title:** Osteoclast contribution to the mechanisms of patterning and regeneration of the zebrafish fin rays

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**Summary: (1000 characters)**

Brachydactyly and syndactyly are diseases characterized by congenital malformations and deformations of the musculoskeletal system. They are characterized by short (brachydactyly) and fused (syndactyly) digits that can be associated and result in defects in bone patterning. The evolutionary link between fin rays and mammalian digits and the availability of zebrafish mutant lines with defective fin ray patterning have fostered the use of zebrafish to study the mechanisms underlying bone patterning. In this context, osteoclasts (bone resorbing cells) have been recently proposed to play a central role in the patterning of zebrafish caudal fin rays through mechanisms that remain to be uncovered. The candidate will develop and characterize mutant and transgenic lines to uncover the mechanisms involving osteoclast contribution and identify the gene network controlling ray patterning in zebrafish.

**Bibliographic references:**

Nakamura, Gehrke, Lemberg, Szymaszek, Shubin (2016) Digits and fin rays share common developmental histories. *Nature* 537, 225–228