

HANDS-ON SESSION

Collagen deposition in zebrafish

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Zebrafish have become a popular model organism to study vertebrate development and disease, due to their genetic accessibility (sequenced genome) and the ability to perform large-scale genetic and chemical screens at low cost. Both adult and growing zebrafish require collagen deposition to enable efficient bone formation. Furthermore, they show an extraordinary capacity for tissue regeneration, for example after fin or fin fold injury.

Similar to the situation in mammals, zebrafish bone is formed by osteoblasts, whose differentiation occurs through the same osteogenic genes as in mammals. Despite a lot of progress in understanding bone regeneration, the details underlying rapid and efficient restoration of collagen fibers and mineralized matrix are incompletely understood.

In this hand-on session, we will image collagen fiber deposition and matrix formation with the help of fluorescence and/or confocal laser scanning microscopy, and modulate matrix formation by pharmacologic or genetic approaches.

In this tutorial you will:

- use microscopy to visualize collagen-containing matrix
- get to know zebrafish larvae (younger than 5 days) as a model organism
- learn about the regenerative capacity of zebrafish
- acquire knowledge on manipulation approaches in zebrafish