

BioSys/BioISI Research Seminar

Spinal cord regeneration in zebrafish

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Spinal cord injuries have dramatic and irreversible effects on motor and sensory functions in higher vertebrates. By contrast, lower vertebrates such as zebrafish retain the ability to repair the spinal cord and restore motility and are increasingly used to study successful strategies of regeneration. We are trying to understand two distinct aspects of spinal cord regeneration in zebrafish: how progenitor ependymal cells contribute to the repair of the spinal cord structure; and what is role of the spinal cord vascular system during regeneration.

Our work has shown that, as in mice, zebrafish ependymal cells actively proliferate in response to injury. However, unlike in mammals, these cells are able to give rise to new neurons, which may contribute to the functional recovery observed in zebrafish.

The study of the spinal cord vasculature has also shown that zebrafish are able to rapidly form new blood vessels with a functional blood-spinal cord barrier. This potential contrasts with the impaired repair of the vascular system in mammals, which is one of the limiting factors for tissue regeneration.

With the study of spinal cord regeneration in zebrafish we are starting to identify new players that promote a pro-regenerative environment.

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