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Title:	Understanding Molecular Mechanisms Underlying Zebrafish Brain Regeneration
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Abstract:	<p>A lot of people around the globe suffer from traumatic brain injuries and neurodegenerative diseases. Despite having many therapeutic advancements, the concept of neuroregeneration or brain repair still remains unclear. Whereas, Zebrafish, a teleost fish shows a robust regenerative response in any of the complex tissues including the brain, following an injury, which makes it an excellent model to study the molecular mechanisms underlying zebrafish brain regeneration. The concept of reprogramming and the proliferation of RG cells and stem cell niches, is the key regulatory mechanisms in the course of brain regeneration. This phenomenon requires a change in gene and protein expression. Therefore, identification of the molecular players in the regenerative process and its application in the non-regenerative species is of key relevance. It has been revealed by the various studies about the genes and proteins that take part in the CNS development and here in my study, I tried to depict the role of those genes and proteins such as sox2, lin28, ascl1a and tgfb1, especially in the proliferative phase in the injury- induced regenerative process. Also, the induction of the EMT transition factor snai2 is upregulated at 3dpi, which helps the proliferating cells to migrate to the site of injury. The role of wnt signalling seemed to be governed through a β-catenin independent manner in the proliferative phase of brain regenerative process. Blockade of GSK3 β resulted in excessive injury proliferation in the RG cells following an injury. The ECM proteases MMP2 and MMP9 were found to be upregulated at 3dpi. Combined blockade of ECM proteases MMP2 and MMP9 resulted in the significant decrease in the proliferation of the RG cells and downregulation of the intracellular genes such as sox2, ascl1a, lin28, tgfb1 that are involved in the brain regenerative mechanism. This shows the utmost importance of ECM factors in the brain regenerative process</p>
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