Title:	Regulation of Yy1a and Yy1b during Zebrafish Retina Regeneration
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Abstract:	Retinal cell loss after an injury is an inevitable problem in mammals which ultimately leads to blindness. In contrast, teleost fish such as zebrafish (Danio rerio) has a remarkable tendency to regenerate its damaged tissue and reestablish function. Upon retinal damage, they mount a robust response to generate their lost retinal cell types, restoring vision. Müller glial is the major players in retina regeneration. They respond to injury by changing their physiology, morphology, and biochemistry. They undergo phases of dedifferentiation, proliferation, and finally re-differentiation, all of which requires changes in gene expression. Although many signaling cascades and regulatory pathways have been identified to play roles at different stages of retina regeneration, chromatin remodeling, which is also one of the ways for transcriptional regulation of genome, is not well studied in the case of zebrafish retina regeneration. Signaling pathways like Notch, Mapk–Erk, Jak-Stat pathway, etc. have been shown to be turned on in the phases post-retinal injury. Roles of many signaling pathways, genetic and epigenetic factors that are involved in this process have been studied so far. However, Yin Yang 1 (YY1) which is known to play a fundamental role in normal biologic processes such as embryogenesis, differentiation, replication, and cellular proliferation, still remains enigmatic during the regeneration process. At early time points during retina regeneration the expression levels of Yy1 goes down indicating that it is crucial for pre-proliferative phase. So, here we show the regulation of Yy1 by inhibiting the signaling that gets activated at early time points such as Jak/stat3, Notch signaling and Sonic hedgehog. We found all these three signaling regulating Yy1 expression levels. We have shown that Yy1a and Yy1b function predominantly during the de-differentiation phase to keep a check on proliferation. As a preliminary result, we found that Inhibition of Jak/stat3 signaling and sonic hedgehog is positively controlled on Yy1 and inhibition of Notch signaling is negatively controlled by Yy1.This study might help provide a new direction for the regulation of regeneration process.
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