Title:	Histone Deacetylase-Mediated Müller Glia Reprogramming through Her4.1-Lin28a Axis Is Essential for Retina Regeneration in Zebrafish
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Abstract:	Histone deacetylases (Hdacs) play significant roles in cellular homeostasis and tissue differentiation. Hdacs are well characterized in various systems for their physiological and epigenetic relevance. However, their significance during retina regeneration remains unclear. Here we show that inhibition of Hdac1 causes a decline in regenerative ability, and injury-dependent regulation of hdacs is essential for regulating regeneration-associated genes like ascl1a, lin28a, and repressors like her4.1 at the injury site. We show selective seclusion of Hdac1 from the proliferating Müller glia-derived progenitor cells (MGPCs) and its upregulation in the neighboring cells. Hdacs negatively regulate her4.1, which also represses lin28a and essential cytokines to control MGPCs proliferation. Interestingly, Hdacs' inhibition reversibly blocks regeneration through the repression of critical cytokines and other regeneration-specific genes, which is also revealed by whole-retina RNA sequence analysis. Our study shows mechanistic understanding of the Hdac pathway during zebrafish retina regeneration. Molecular Mechanism of Gene Regulation; Molecular Neuroscience; Transcriptomics; Model Organism
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