Title:	Understanding the Effects of Valproic Acid on the Zebrafish Morphology, Fin Regeneration Capacity, and Retina Regeneration
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Abstract:	The zebrafish (Danio rerio) possesses a remarkable regenerative capacity, making it an exceptional model organism for studying tissue repair and regeneration. In this study, we investigated the impact of Valproic Acid (VPA), a histone deacetylase inhibitor, on ze- brafish embryos and larvae, as well as its effects on axolotl embryonic development. The aims of this research were to understand the influence of VPA on early zebrafish develop- ment and caudal fin regeneration, explore its effects on axolotl embryonic morphology, and investigate its impact on retinal cell proliferation during retina regeneration. To assess the effects of VPA on zebrafish embryos, preliminary experiments were con- ducted using different concentrations of VPA. Notable changes in embryonic morphology were observed, including swim sac shrinkage at 500 µM and cardiac edema and yolk sac edema at 1000 µM concentrations. Subsequently, zebrafish larvae were exposed to VPA at various concentrations, and caudal fin regeneration was examined after amputation. The study revealed that VPA significantly influenced the growth of the caudal fin in a dose- dependent manner, suggesting a direct correlation between VPA concentration and regen- erative outcomes. Additionally, we explored the effects of VPA on axolotl embryonic development. Ex- posure to different concentrations of VPA led to malformation of the eyes at 1 mM and a cavity in the heart at 10 mM. This observation highlights the impact of VPA on axolotl embryonic morphology and raises intriguing questions about its mechanisms of action. Furthermore, we investigated the influence of VPA on retinal cell proliferation during retina regeneration. Results indicated a dose-dependent effect, with an increase in VPA concentration leading to a significant decrease in proliferative cells in the retina. Under- standing VPA's impact on retinal regeneration and its effects on cell proliferation may have implications for potential therapeutic applications in regenerative medicine. In conclusion, this study provides valuable insights into the effects of VPA on zebrafish and axolotl embryonic development, caudal fin regeneration, and retinal cell proliferation. These findings contribute to our understanding of regenerative processes and may have important implications for regenerative medicine and tissue repair strategies in the future.
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