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### Utilizing CRISPR/Cas9 Gene Editing Determine the Role of *cnr1* during Zebrafish Development

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## **Utilizing CRISPR/Cas9 Gene Editing Determine the Role of *cnr1* during Zebrafish Development**

Camme Sells

Advisor: Nikki Glenn, Ph.D.

In a world where cannabinoids are being used more frequently as for medicinal purposes, the importance for research on cannabinoid biology is steadily increasing. The goal of this study was to gain a greater understanding of the effect cannabinoids have on developing zebrafish embryos. Work in this area of developmental biology could give way to an understanding of the safety of a human fetus during pregnancy with a mother who uses cannabis medicinal therapy. The CRISPR/Cas 9 system was utilized in this study to genetically edit the zebrafish embryo genome to remove the function of the Cannabinoid Receptor 1 (*cnr1*). *Cnr1* is a one of the receptors that is a part of the endocannabinoid system, the other being *cnr2*, which serve as receptors for cannabinoid compounds and endogenous Anandamide. CRISPR/ cas 9 is an effective tool used to mutate genes in a way that allow for loss of function studies, which can provide information beyond the effects that occur in embryos that still have *cnr1* fully intact. With this in mind, our research was designed to observe behavioral differences in young *cnr1* mutant fish and fish who have receptor when exposed to cannabinoids. This research could provide an opportunity to study the toxicology of mutant embryos when exposed to cannabinoid agonists and help determine which receptor they are targeting. This research is clinically important for future study and understanding the effects of cannabinoid therapy on early developmental patterning.