

## **Tuning cichlid fish visual sensitivities using differential gene expression and coding sequence evolution**

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Cichlid fishes are highly speciose with over 1500 species in the Great Lakes of Africa. During their recent evolution, these fishes have rapidly diverged in morphology and color pattern. We have found that their visual systems are also highly diverse with some of the largest known differences in visual sensitivities amongst closely related species. This diversity is a result of cichlids having seven unique cone opsin genes. Because these genes are sensitive from the ultraviolet to the red ends of the spectrum, and because species differ in which sets of these genes they express, visual sensitivities can show large shifts between species. Cichlids can also more finely tune visual pigments through alterations in opsin amino acid sequence. By comparing the visual sensitivities of more than 50 species from Lake Malawi and 8 species from Lake Victoria, we have determined that ecology plays an important role in shaping these sensitivities. This includes factors such as foraging and photic environment with variation occurring over small geographic scales. We will discuss our progress to determine the genetic mechanisms which control cichlid visual sensitivities as well as their role in driving cichlid diversification.