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“Identifying Targets of Estrogenic Modulation in the Neural Retina”

In order to tackle visual deficits, as in age-related macular degeneration (AMD), retinitis pigmentosa (RP), and night blindness, there is a need for a greater understanding of how to modulate the function and integrity of the retinal photoreceptor and inner nuclear (INL) layers. Although endocrine modulators might be involved, there is no animal model for retinal endocrine modulation, including the cellular targets, signaling pathways and their consequences to vision. Thus, using the comparative method across several species of frogs, our immediate goal is to define the mechanisms of endocrine modulation of the photoreceptor-INL interface in rod- versus cone-dominant taxa (i.e., nocturnal vs. diurnal). In our animal models, our preliminary data show that estrogen dependent processes modulate photoreceptor-INL light sensitivity. The specific target of this modulation is investigated in this project using immunohistochemistry labeling of G-protein coupled estrogen receptors in the neural retina, a potential target of estrogen modulation. Our data show expression in specific cells of the outer and inner nuclear layers, matching the location of visual sensitivity estrogenic modulation. Co-label with cell specific antibodies will identify the cell type exhibiting this expression. The results will isolate a potential target for the endocrine-retinal interface.