

# South Carolina Lions Pilot Research Project 2009-2010



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## **Oxidative Stress and Vision Loss**

A number of studies have provided indirect evidence that oxidative damage contributes to the development of several diseases of the retina such as AMD, Stargardt and retinitis pigmentosa. However, the precise role(s) of reactive oxygen species in the pathogenesis of these diseases remains unknown. The retina is continuously exposed to high levels of oxidative stress due to high oxygen-tension within the retinal vasculature and exposure to light for normal vision. The goal of this project is to understand how these oxidants along with aging and genetic factors damage the retina and identify novel ways to prevent this injury. We plan to concentrate on how oxidative stress in the retina leads to mitochondrial DNA damage and cell death, as well as the release of pro-inflammatory agents from retina cells that accelerate oxidative injury. These studies will utilize experimental models of human ocular disease, cell culture system and state of the art proteomic analysis. As we characterize the effects of the underlying damage, we plan to examine the repair pathways, and search for ways to minimize oxidative injury and promote repair.