Researchers at the University of South Florida have discovered that glucose regulated protein 94 (Grp94) inhibitors can be used to develop an effective therapy for treating primary open angle glaucoma (POAG), as well as steroid-induced ocular hypertensions and glaucomas.

Glaucoma can be defined as a group of eye diseases which damage the optic nerve and generate vision loss. POAG is the most common form of glaucoma, and affects more than two million Americans. This type of glaucoma is caused by mutations in myocilin. Mutant myocilin misfolding and aggregation in trabecular meshwork cells cause cellular apoptosis, which hastens an increase in intraocular pressure. This pressure is a primary risk factor in POAG development. Steroid-induced glaucomas represent an additional form of the disease. Steroids are administered as a treatment option for many ailments. However, prolonged steroid use often results in elevated intraocular pressure. If left untreated, this pressure could cause ocular hypertension, glaucoma, and ultimately blindness. Currently, a cure or effective treatment option for patients afflicted with steroid-induced glaucoma or POAG is not available.

USF researchers have developed novel methods utilizing Grp94 to treat the above forms of glaucoma. The Grp94 protein is a heat shock protein 90 (Hsp90) family member. The relationship between Hsp90 and ocular diseases have been widely recognized and established. By means of selectively targeting the endoplasmic reticulum chaperone Grp94 using siRNA knockdown or small molecule inhibitors, mutant myocilin can be removed in an efficient manner. This method provides a potential, strong new option for treating primary open angle glaucoma, as well as steroid-induced ocular hypertensions and glaucomas.

**ADVANTAGES:**
- Facilitates clearance of aggregated myocilin proteins
- Inhibits Grp94
- Effectively treats myocilin glaucomas
- Inhibits steroid-induced ocular changes
- Reduces eye damage

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