Open angle glaucoma (OAG) is the second leading cause of blindness in the world and is characterized by changes in the optic nerve head and retinal ganglion cell death, resulting in irreversible vision loss. The lack of understanding of the roles of various risk factors in OAG constitutes a major limitation in the diagnosis, management, and treatment of OAG. One of the known risk factors for glaucoma is elevated intraocular pressure.

Mathematical modeling offers an important tool for understanding the relative influence of risk factors by linking the mechanical action of IOP on ocular tissues to the blood flow and oxygen transport within the ocular tissues.

The main objective of this work is to study the relationship between intraocular pressure, blood pressure, and blood flow autoregulation in the retinal vasculature and develop mathematical models that can be used to model conditions specific to individual glaucoma patients.