

# Mathematical models in the diagnosis and treatment of glaucoma

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## Abstract

The front part of the eye is filled with a clear fluid called aqueous humor (AH) The fluid is continuously produced in the ciliary body and leaves the eye through a porous structure called trabecular mesh. In some situations it occurs an obstruction of the trabecular mesh that prevents the normal dynamic of the flow in the eye. An increase of pressure inside the anterior chamber of the eye, the so called intraocular pressure (IOP), is then observed. This increase in IOP is the main cause of glaucoma because more likely the optic nerve will be damaged. In this talk a mathematical model consisting, of a set of coupled systems of PDEs, that simulate the flow of AH in the anterior chamber of the eye is presented. We study numerically the influence, in the outflow of AH, of its rate of production and also of the porosity and permeability of the trabecular mesh. Treatments with two groups of drugs -acting on the production rate and on the permeability of TM- will be compared.

**Keywords:** Partial Differential Equations, diffusion, convection, porous media, permeability, porosity, trabecular mesh, aqueous humor, intra ocular pressure.

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