Therapeutic Evaluation of Griseofulvin in a Mouse Model of Choroidal Neovascularization

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Abnormal blood vessel growth, termed neovascularization, causes diseases such as wet-age related macular degeneration (wet AMD), leading to blindness. Wet AMD is a chronic eye disease that causes vision loss in the center of the field of vision due to choroidal neovascularization: blood vessels that leak fluid or blood into the macula, or the back of the eye. This research explores a possible treatment that may decrease neovascularization in the eye. That treatment may be the FDA approved antifungal drug, griseofulvin. One of griseofulvin's off target effects is that it inhibits an enzyme called ferrochelatase (FECH). Previous research showed that decreased FECH is associated with decreased neovascularization. The purpose of this research was to see if griseofulvin can produce the same results as the reduction of FECH to decrease neovascularization. To test this hypothesis, griseofulvin was fed to 30 mice over 3 weeks at 0%, .5%, and 1% doses (10 mice each). On day 7, the choroid of the eye was burned using a laser. The body's attempt to heal the burns on the choroid formed a model for choroidal neovascularization. After 14 days, the choroids of the mice were imaged with an Optical Coherence Tomography (OCT) and on the 21st day the choroid was imaged once more by OCT, the mice were sacrificed and the livers were harvested. The experimental mice had significantly larger livers, depicting that the oral feed protocol was successful in administering the drug through their food. Through an ANOVA Post-Dunnet Hoc's statistics test, the OCT images revealed a significant decrease in lesion size of the 1% and .5% groups that were administered griseofulvin. As hypothesized, the inhibition of FECH by griseofulvin decreased neovascularization.

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