

# INVESTIGATING THE INFLUENCE OF LIGHT INTENSITY AND WAVELENGTH ON RETINAL STRAYLIGHT

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## BACKGROUND AND AIM(S) OF THE PROJECT

Ocular straylight is light scattered by the ocular media that creates a more or less homogeneous haze over the retinal image. Pathologies such as cataract, corneal edema, Fuchs corneal dystrophy or vitreous floaters are known to increase retinal straylight and may lead to symptoms such as contrast sensitivity loss, disability glare and halos.

The recently introduced yellow intraocular lenses (IOLs) mimic the filtering effect of the aging human lens and are promoted with the argument that by blocking blue and ultraviolet light, they would protect the retina. However, their use of these lenses is highly debated as they also block a part of the visual spectrum used in scotopic conditions.

In this project, we wish to investigate how the blue blocking filter in these IOLs influences the retinal straylight in comparison to a clear IOL and young phakic eyes.

## DEVELOPMENT OF THE PROJECT

A group of 50 patients diagnosed with cataract, divided into two subgroups, will be included in this study. The first group of 25 patients will be implanted with a clear IOL, while the second group of 25 patients is implanted with a yellow IOL. A third group of at least 25 non-cataractous phakic subjects will be included as well to serve as a control group.

Patients with prior ocular surgery, retinal defects or glaucoma will be excluded from this study.

The IOLs used in this study are white and yellow versions of the Morcher 89A "Bag-in-the-Lens". Apart from their chromatic filter, these two hydrophilic acrylic lenses are identical with a unique single-piece haptic and a 5 mm optical zone.

The retinal straylight measurements in this study were performed using the C-Quant (Oculus Optikgeräte, Wetzlar, Germany), a commercial version of the compensation comparison technique proposed by Van den Berg. This method has been described in full detail in the literature and has been thoroughly validated. It provides a measure for the straylight parameter  $\log(s)$ , as well as an estimation of the fit quality  $Q$  of the psychometric function and an estimated repeated measures standard deviation  $Esd$ .

Patients will be recruited from the patient population in our department for whom cataract removal was deemed necessary. Both eyes will be implanted with the same IOL type in order to avoid that patients experience discomfort by having differences in color vision between both eyes. Three months postoperatively the retinal straylight is measured using the C-Quant in white light and using three color filters (450 nm, 550 nm and 650 nm). Each measurement will be repeated once.

A control group of at least 25 non-cataractous phakic subjects is also recruited from the personnel of the Antwerp University Hospital, who will undergo the same set of tests.

#### REFERENCES

- (1) ROZEMA J.J., VAN DEN BERG T.J.T.P., TASSIGNON M.J. – Retinal Straylight as a Function of Age and Ocular Biometry in Healthy Eyes. IOVS (accepted)
- (2) ROZEMA J.J., COECKELBERGH T., VAN DEN BERG T.J.T.P., TRAU R., DUCHATEAU N.C., LEMMENS S., TASSIGNON M.J. – Straylight Before and After LASEK in Myopia: Changes in Retinal Straylight. IOVS (accepted)