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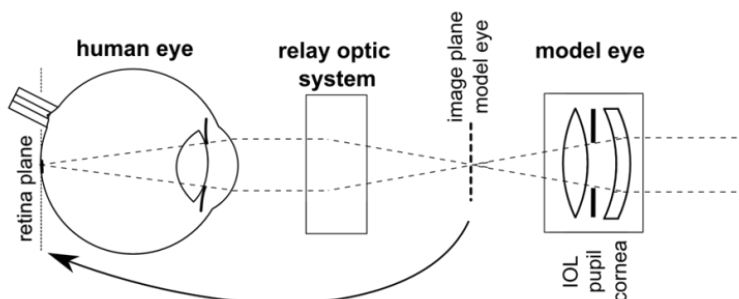
**Vision simulator device for the prediction of pseudophakic vision quality**

Wolfgang Brezna<sup>1</sup>, Kirsten Lux<sup>1</sup>, Nikolaus Dragostinoff<sup>1</sup>, Christian Krutzler<sup>1</sup>, Nicole Plank<sup>1</sup>, Rainer Tobisch<sup>1</sup>, Agnes Boltz<sup>2</sup>, Gerhard Garhöfer<sup>2</sup>, Reinhard Told<sup>2</sup>, Katarzyna Witkowska<sup>2</sup> and Leopold Schmetterer<sup>2</sup>

<sup>1</sup>ACMIT GmbH, Austria

<sup>2</sup>Medical University of Vienna, Austria

A vision simulator device is applied to predict the perceived vision quality after implantation of a prototype intraocular lens (IOL) without the need of actually performing the IOL implantation. This can fill the gap between preclinical IOL development and clinical implantation studies and can avoid implantation risks and ethical issues associated with clinical testing new and risky lens designs. As a cost effective and non-invasive test procedure it promotes the development and evaluation of new lens concepts. The IOL to be tested is inserted into a carefully designed model eye and projecting the obtained image of this model eye directly onto the retina of the test person (Figure 1). For the projection, a relay optic system is applied, which cancels out the effects of the refractive structures of the test person's eye, and effectively moves the image plane to the human eye's retina plane. Different visual tests (ETDRS, FACT) can be applied with the device, including tests of the subjective preference of a specific IOL among a few other IOLs. This information cannot be obtained by standard physical-optical IOL characterisation with an optical bench, and is one of the advantages offered by the vision simulator device. The device was applied for recording the visual acuity of bifocal and trifocal IOL prototypes, and the outcome was compared with visual acuity data from pseudophakic test persons found in the literature. The requirements for the visual tests with the device are discussed. Furthermore, steps for reducing prognosis errors are proposed. The vision simulator device is compared with other similar approaches.



**Biography**

Wolfgang Brezna received his PhD in Technical Sciences from the Vienna University of Technology in 2005. Since 2011, he is employee in the Applied Optics/Ophthalmology Department of ACMIT GmbH, Austria. Besides IOL development and applied optics for medical technology, his main activity is the development of the vision simulator device and its application in various IOL assessment studies.

wolfgang.brezna@acmit.at

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