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IN VITRO LENS SCATTER MEASUREMENTS AND GLARE TESTING

((C. Beckman[1, 2], J. Thaung[1, 2] and J. Sjöstrand[1].)) Department of Ophthalmology, University of Göteborg[1]; Microwave Technology, Chalmers University of Technology[2], Göteborg, Sweden.

Purpose. Develop a methodology for accurate *in vitro* light scattering measurements of extracted eye lenses with intact lens capsule, and to compare the results with clinical glare testing performed before surgery. **Methods**. The lens is positioned in a measurement cell, surrounded by biological salt solution, less than an hour after extraction. In the cell bottom an optical fiber-end is connected. Light from one of three laser sources used in the measurements (He-Ne: 633 nm; He-Ne: 543 nm; Argon: 458 nm) is fed into the optical fiber, whose core diameter is about 110 µm. The lens, positioned at focal length distance from the fiber-end, collimates the laser light out through the open top of the cell. The light exiting the cell is collected by an integrating sphere which has an extra 7 mm diameter circular port opposite to the 30 mm diameter entrance port. With this arrangement the directly transmitted light can be directed out through the top port of the sphere allowing scattered light between 1.3° and 49° to be detected. **Results**. As a first test we measured 8 eyes from 5 "New Zealand White" rabbits. The measured scattered powers were estimated to 18% (633 nm), 20% (543 nm) and 26% (458 nm). We also measured 2 extracted human cataract lenses. Before surgery the patients, from whom these lenses were taken, were measured with a glare test utilizing low contrast letters in the absence and presence of glare sources. Using a derived optical model we compared the two measurements and the results agreed within the estimated inaccuracy of the model. **Conclusion**. By comparing accurate *in vitro* light scattering measurements on extracted cataract lenses, with results from controlled glare testing, better models and understanding of the performance of cataractous eyes may be achieved.

None

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