Corneal optical coherence tomography speckle in crosslinked and untreated rabbit eyes in response to elevated intraocular pressure

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21 December 2021

Abstract

Intraocular pressure (IOP) constantly affects the cornea and its microstructure, which in turn undergoes irreversible changes related to the ageing process, pathological conditions (e.g., keratoconus), or eye diseases associated with elevated IOP (e.g., glaucoma). A consequence of changes in the corneal structure is a change in its biomechanical properties, which affects its stiffness. Reorganization of corneal microstructure is difficult to investigate under *in-vivo* conditions. Therefore, the development of methods aimed at visualizing microstructural properties of the cornea in an *in-vivo* manner is a direction of studies with great clinical potential in the diagnostics of eye diseases. In this seminar, I will present the results of an *in-vivo* experiment on New Zealand White rabbits and an *ex-vivo* experiment on the eyes of these animals, the purpose of which was to check: 1) whether the increase in IOP affects the statistics of the corneal speckle in OCT images and 2) whether the statistics of the corneal speckle in these images differentiates the crosslinked rabbit eyes from those in the control group.

About the presenter

Monika E. Danielewska received a master's degree in technical physics, with a specialization in biomedical engineering from the Wrocław University of Science and Technology (Wrocław, Poland) in 2008, a Ph.D. degree in biocybernetics and biomedical engineering from the Silesian University of Technology (Gliwice, Poland) in 2013, and a habilitation degree in biomedical engineering from the Silesian University of Technology in 2021. Her research interests include biomedical signal processing and its application to ocular instrumentation, particularly related to the early diagnosis of glaucoma and corneal disorders.