STSM Scientific Report

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COST Action: TD1002

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Host Institution: University of Liverpool, School of Engineering.

Purpose of the STSM;

An atomic force spectroscopy bio-mechanical characterization of the sclera (the white part of the eye) to develop an AFM- based tool for ophthalmic diagnosis.

Description of the work carried out during the STSM;

We decided to use the pig eye for our preliminary investigations because it has dimensions very similar to the human eye.

During these three weeks we optimized a protocol to study the different layers of the sclera, from the episclera to the choroid layer. We obtained elasticity maps of the episclera by using the picoForce technique in a liquid environments (PBS).

Description of the main results obtained;

-We obtained preliminary data of the mechanical behavior of the episclera in a liquid environment.

-We indentified typical features and structures of the collagen fibrils and of the proteoglycans.

-We compared different sample preparation protocols to obtain the less perturbed sclera structure.

Future collaboration with host institution (if applicable).

Next step will be a systematic study to map the whole sclera structure by applying the method optimized during these three weeks. Finally a comparison among physiologic and pathologic scleras will be necessary to determine the mechanical pathological characteristics.

Foreseen publications/articles resulting or to result from the STSM (if applicable);

Publication of an article will be possible as soon as a systematic study of the whole sclera will be performed. Our preliminary data, because relative to just few spots of the pig sclera cannot be used for publication yet.