SHRINKAGE OF TISSUE SAMPLES DURING DEHYDRATION AND CLEARING

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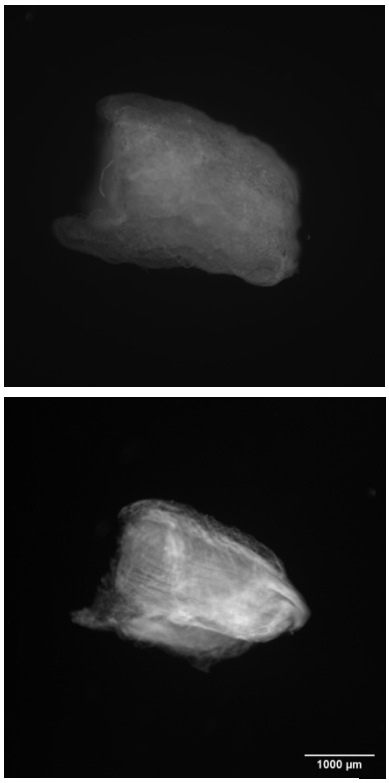

Figure 1: A nerve sample before and after clearing

Shrinkage often takes place in biological tissues during different phases of sample preparation [1]. Dehydration with methanol and clearing with BABB (benzyl alcohol benzyl benzoate) solution is a standard method used for sample preparation for optical projection tomography (OPT). OPT is a powerful tool for the study of biomedical specimen on mesoscopic level [2].

In the present study, shrinkage of the nerve tissue samples during dehydration with methanol and clearing with BABB solution was evaluated. Dehydration and clearing was conducted on samples with or without an agarose cast. All samples were scanned on a custom made OPT scanner at the same magnification, both before and after the dehydration and clearing procedures. The step angle was set to 0.9°, yielding 400 images per scan. The acquired images were reconstructed using a filtered back-projection algorithm. The volume of the samples was estimated using virtual spatial grid of lines, the Fakir Method [3]. Shrinkage of the samples ranged in between 25-45% of the original volume and depended on the presence of the agarose cast during both the dehydration and clearing processes. Supported by CZ.02.1.01/0.0/0.0/16_013/0001775 Modernization and support of research activities of the national infrastructure for biological and medical imaging Czech-BioImaging funded by OP RDE and by MEYS (LM2015062 Czech-Bioimaging, LTC17023 INTER-COST).

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