

## OPTICAL PROJECTION TOMOGRAPHY AND VOLUME MEASUREMENT OF ISOLATED ISLETS OF LANGERHANS

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Optical projection tomography (OPT) is a powerful tool for the study of biomedical specimen on mesoscopic level [1]. Its suitability to visualize distribution and to quantify Langerhans islets in mouse pancreas was previously demonstrated [2,3]. However, whole lobes of pancreas were usually mounted in agarose block and visualized.

In the present study, isolated individual human pancreatic islets were used. The volume of individual islets is important in clinical islet transplantation, where the dose of islet volume per body weight of a recipient is believed to determine the outcome of transplantation. Fresh pancreatic islets isolated by a collagenase-based method were individually dithionite-stained and mounted in an agarose block. All samples were immediately scanned on a custom made OPT scanner at the same magnification. 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 and equivalent ellipsoid of individual islets were estimated using virtual spatial grid of lines, the Fakir Method [4]. Supported by CSF (13-12412S, 14-10440S) and by MEYS (LM2015062 Czech-Bioimaging).

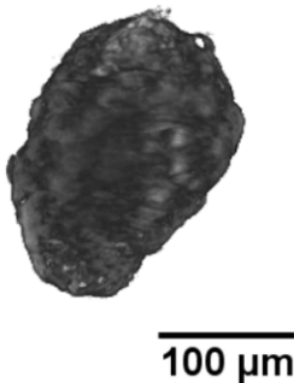


Figure 1: A 3D reconstructed islet.

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