

Biotissue-mimicking phantoms for biophotonics applications

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Increasing importance of noninvasive biomedical diagnostics and minimally invasive therapy opens new horizons for photonic technology and leads to development of novel optical methods and devices. An important step in this development is validation of the designed systems, methods and models. Thus, stable samples with well-controlled optical properties that closely match those of biological tissues are required for this testing step. No standard optical phantoms are commercially available up to date.

We show our progress in manufacturing biotissue-mimicking phantoms made from different materials.

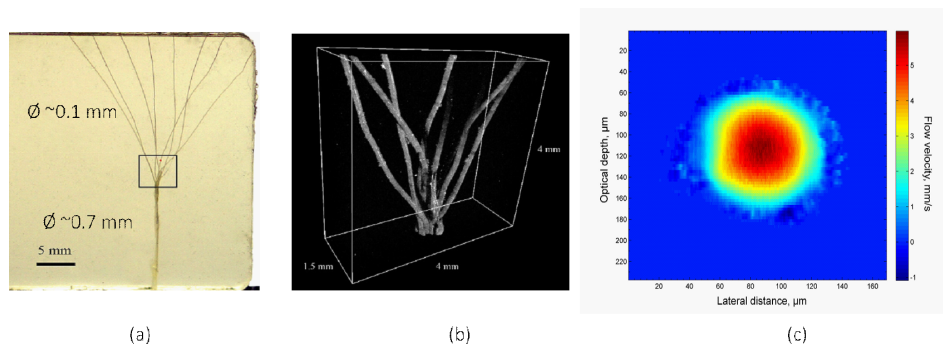


Figure 1: Manufactured capillary system in a transparent phantom layer (a). For the better visibility the channels were made in transparent layer and filled with the Intralipid 4%. 3D optical coherence tomography (OCT) image of the capillary tree filled with Intralipid 4% (b). The imaged area corresponds to the black rectangle shown on the left picture. The diameter of the vessels is of 0.1 mm. Map of the Intralipid flow velocity profiles measured with Doppler OCT technique inside the capillary marked with red dot in the leftmost figure (c).

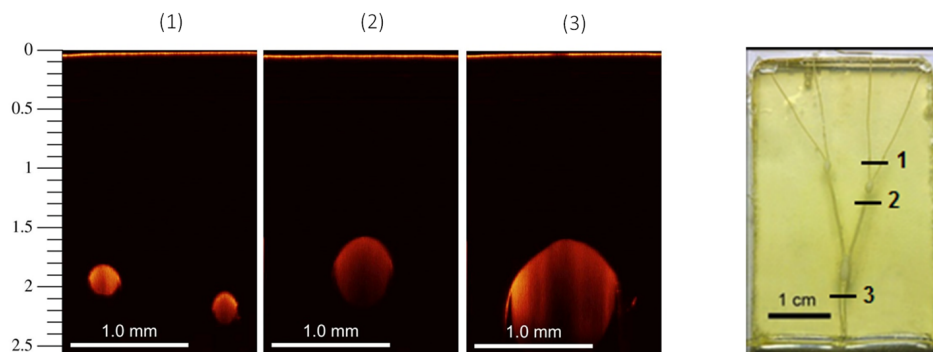


Figure 2: OCT images of the capillaries in a transparent phantom layer filled with Intralipid 4%.