

Section:

OPTICAL TECHNOLOGIES IN BIOPHYSICS & MEDICINE XXIV

Title:

Intraoperative OCT diagnosis of brain gliomas

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Abstract:

Optical coherence tomography (OCT) is fast and noninvasive medical diagnostic modality, which enables cross-sectional imaging of the internal microstructure in biological tissues by measuring echoes of the backscattered light. The analysis of OCT signals is aimed at determining the optical properties, in particular the scattering coefficient, of an object. The detailed examination of OCT images is also strongly disturbed by the presence of speckle noise, which is an important contributor to the texture patterns in OCT images. Since speckle depends upon the size and density of the scatterers within a tissue, texture analysis of speckle patterns can be used for classification of normal and pathological tissues. In this work, the statistical analysis and the wavelet analysis

of the OCT speckle patterns were performed for the OCT images of the *ex vivo* rat brain glioma model 101.8 and intact brain tissues. The results were compared with those obtained by the analysis of tissue scattering properties and histological studies. This work demonstrates the prospects of OCT speckle analysis as well as its combination with scattering analysis for intraoperative neurodiagnosis.

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