

ARTÍCULO ACEPTADO

Journal: Journal of Biomedical Optics

Paper: Automated Identification of Tumor Microscopic Morphology, based upon Macroscopically Measured Scatter Signatures

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Abstracts:

An automated algorithm and methodology is presented to identify tumor tissue morphologies based upon broadband scatter data measured by raster scan imaging of the samples. A quasi-confocal reflectance imaging system was used to directly measure the tissue scatter reflectance in situ, and the spectrum was used to identify the spectral power, amplitude and total wavelength-integrated intensity. Pancreatic tumor and normal samples were characterized using the instrument and subtle changes in the scatter signal were encountered within regions of each sample. Discrimination between normal vs. tumor tissue was readily performed using a K-Nearest Neighbor (KNN) classifier algorithm. A similar approach worked for regions of tumor morphology when statistical pre-processing of the scattering parameters was included to create additional data features. This type of automated interpretation methodology can provide a tool for guiding surgical resection in areas where microscopy imaging cannot be realized efficiently by the surgeon. In addition, the results indicate important design changes for future systems.