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Feasibility of digitally stained multimodal confocal mosaics to simulate histopathology.

Gareau DS.; J Biomed Opt. 2009 May-Jun;14(3): DOI: 10.1117/1.3149853;2009: 034050., 2009

ABSTRACT

Fluorescence confocal mosaicing microscopy of tissue biopsies stained with acridine orange has been shown to accurately identify tumors and with an overall sensitivity of 96.6% and specificity of 89.2%. However, fluorescence shows only nuclear detail similar to hematoxylin in histopathology and does not show collagen or cytoplasm, which may provide necessary negative contrast information similar to eosin used in histopathology. Reflectance mode contrast is sensitive to collagen and cytoplasm without staining. To further improve sensitivity and specificity, digitally stained confocal mosaics combine confocal fluorescence and reflectance images in a multimodal pseudo-color image to mimic the appearance of histopathology with hematoxylin and eosin and facilitate the introduction of confocal microscopy into the clinical realm.