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### Confocal reflectance mosaicing of basal cell carcinomas in Mohs surgical skin excisions

Patel Y, Nehal K, Aranda L, Li Y, Halpern A, Rajadhyaksha M, 2007 Society of Photo-Optical Instrumentation Engineers. (DOI: 10.1117/1.2750294)

#### ABSTRACT

Precise removal of basal cell carcinomas (BCCs) with minimal damage to the surrounding normal skin is guided by the examination of frozen histology of each excision during Mohs surgery. The preparation of frozen histology is slow, requiring 20 to 45 min per excision. Confocal reflectance mosaicing may enable rapid detection of BCCs directly in surgical excisions, with minimal need for frozen histology. Soaking the excisions in acetic acid rapidly brightens nuclei and enhances BCC-to-dermis contrast. Clinically useful concentrations of acetic acid from 10 to 1% require 30 s to 5 min, respectively. A tissue fixture precisely controls the stability, flatness, tilt, and sag of the excisions, which enables mosaicing of 36 x 36 images to create a field of view of 12 x 12 mm. This simulates a 2x magnification view in light microscopes, which is routinely used by Mohs surgeons to examine frozen histology. Compared to brightfield, cross-polarization enhances contrast and detectability of BCCs in the papillary dermis but not in the reticular dermis. Comparison of mosaics to histology shows that nodular, micronodular, and superficial BCCs are easily detected. However, infiltrative and sclerosing BCCs tend to be obscured within the surrounding bright dermis. The mosaicing method currently requires 9 min, and thus may expedite Mohs surgery.