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**Confocal fluorescence microscopy for rapid evaluation of invasive tumor cellularity of inflammatory breast carcinoma core needle biopsies.**

*Dobbs J, Krishnamurthy S, Kyrish M, Benveniste AP, Yang W, Richards-Kortum R., Breast Cancer Res Treat. 2014 Nov 23*

### **ABSTRACT**

Tissue sampling is a problematic issue for inflammatory breast carcinoma, and immediate evaluation following core needle biopsy is needed to evaluate specimen adequacy. We sought to determine if confocal fluorescence microscopy provides sufficient resolution to evaluate specimen adequacy by comparing invasive tumor cellularity estimated from standard histologic images to invasive tumor cellularity estimated from confocal images of breast core needle biopsy specimens. Grayscale confocal fluorescence images of breast core needle biopsy specimens were acquired following proflavine application. A breast-dedicated pathologist evaluated invasive tumor cellularity in histologic images with hematoxylin and eosin staining and in grayscale and false-colored confocal images of cores. Agreement between cellularity estimates was quantified using a kappa coefficient. 23 cores from 23 patients with suspected inflammatory breast carcinoma were imaged. Confocal images were acquired in an average of less than 2 min per core. Invasive tumor cellularity estimated from histologic and grayscale confocal images showed moderate agreement by kappa coefficient:  $\kappa = 0.48 \pm 0.09$  ( $p < 0.001$ ). Grayscale confocal images require less than 2 min for acquisition and allow for evaluation of invasive tumor cellularity in breast core needle biopsy specimens with moderate agreement to histologic images. We show that confocal fluorescence microscopy can be performed immediately following specimen acquisition and could indicate the need for additional biopsies at the initial visit.