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### Diagnostic Applicability of In Vivo Confocal Scanning Laser Microscopy in Melanocytic Skin Tumors

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#### ABSTRACT

In vivo confocal laser scanning microscopy (CLSM) represents a novel imaging tool that allows the examination of skin morphology in real time at a resolution equal to that of conventional microscopes. The aim of the study was to test the applicability of CLSM to the diagnostic discrimination of benign nevi and melanoma. Five independent observers without previous experience in CLSM received a standardized instruction about diagnostic CLSM features. Subsequently, 117 melanocytic skin tumors (90 benign nevi and 27 melanoma), imaged using a commercially available, near-infrared, reflectance confocal laser scanning microscope, were evaluated by each observer. Overall, sensitivity of 88.15% and specificity of 97.60% was achieved by the five observers. Logistic regression analysis revealed that mainly cytomorphology, architecture and keratinocyte cell borders should be taken into account for diagnostic decisions. Remarkably, using the presence or absence of monomorphic melanocytes as a single diagnostic criterion, the classification results with a sensitivity of 98.15% and a specificity of 98.89% were superior to the intuitive, integrative judgement of the observers. This first sensitivity and specificity study with CLSM has yielded promising results. CLSM provides new and useful information to the clinician diagnosing melanocytic skin tumors.