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### Sensitivity and Specificity of Confocal Laser-Scanning Microscopy for In Vivo Diagnosis of Malignant Skin Tumors

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#### ABSTRACT

**BACKGROUND:** Melanoma and nonmelanoma skin cancer are the most frequent malignant tumors by far among whites.

Currently, early diagnosis is the most efficient method for preventing a fatal outcome. In vivo confocal laser-scanning microscopy (CLSM) is a recently developed potential diagnostic tool.

**METHODS:** One hundred seventeen melanocytic skin lesions and 45 nonmelanocytic skin lesions (90 benign nevi, 27 malignant melanomas, 15 basal cell carcinomas, and 30 seborrheic keratoses) were sampled consecutively and were examined using proprietary CLSM equipment. Stored images were rated by 4 independent observers.

**RESULTS:** Differentiation between melanoma and all other lesions based solely on CLSM examination was achieved with a positive predictive value of 94.22%. Malignant lesions (melanoma and basal cell carcinoma) as a group were diagnosed with a positive predictive value of 96.34%. Assessment of distinct CLSM features showed a strong interobserver correlation ( $\kappa > 0.80$  for 11 of 13 criteria). Classification and regression tree analysis yielded a 3-step algorithm based on only 3 criteria, facilitating a correct classification in 96.30% of melanomas, 98.89% of benign nevi, and 100% of basal cell carcinomas and seborrheic keratoses.

**CONCLUSIONS:** In vivo CLSM examination appeared to be a promising method for the noninvasive assessment of melanoma and nonmelanoma skin tumors.