DIFFERENTIAL DIAGNOSIS OF PIGMENTED SKIN LESIONS BASED ON IN VIVO HIGHER-HARMONIC GENERATION BIOPSY

Ming-Rung Tsai,1 Yi-Hua Liao,2 and Chi-Kuang Sun1,3,4
1Department of Electrical Engineering and Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taipei, 10617, Taiwan
2Department of Dermatology, National Taiwan University Hospital and National Taiwan University College of Medicine, Taipei, 10051, Taiwan
3Molecular Imaging Center & Graduate Institute of Biomedical Electronic and Bioinformatics, National Taiwan University, Taipei, 10617, Taiwan
4Institute of Physics & Research Center for Applied Sciences, Academia Sinica, Taipei, 11529, Taiwan
E-mail: d96941005@ntu.edu.tw

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In clinical diagnosis, pigmented lesions are usually diagnosed using the naked eye and are with similar appearance. This may result in misdiagnosis and differential diagnosis of benign versus malignant lesions is thus important to ensure proper prognosis and treatment. Biopsy is currently the gold standard to make the definitive diagnosis, but this medical procedure is invasive and painful for patients. Recently in vivo harmonic generation microscopy (HGM) has been reported to have a superior performance on healthy human skin [1,2] and oral mucosa [3]. With the noninvasive nature, high penetration capability, and a high resolution, HGM could serve as an ideal virtual biopsy tool for in vivo, in situ, and immediate differential diagnosis of pigmented skin lesions. It is thus critical to investigate if the endogenous contrast provided by the HGM enough to diagnose the differences between the pigmented skin lesions. In this paper, we summarize our current clinical trial to perform in vivo HGM on pigmented skin lesions, including pigmented basal cell carcinoma, seborrheic keratosis, nevocellular nevus and hemangioma. Our clinical trial indicates that HGM is capable of differentiating benign from malignant pigmented skin lesions non-invasively with sensitivity and specificity up to 100% and 94%, respectively, by using surgical biopsy and clinical diagnosis as the gold standard.