OMICS International
conferenceseries.com

Chi-Kuang Sun et al., J Med Diagn Meth 2015, 4:3
http://dx.doi.org/10.4172/2168-9784.C1.002

International Conference on
Medical Devices
September 21-22, 2015 Orlando, USA

In vivo non-invasive multiple harmonic generation biopsy for diagnosing and scoring of collagen alignment at the tumor interface

Chi-Kuang Sun[1], **Yu-Cheng Chen**[1], **Wei-Hung Weng**[1], **Yi-Hua Liao**[1] and **Gwo Giun (Chris) Lee**[2]
[1]National Taiwan University, Taiwan
[2]National Cheng Kung University, Taiwan

Collagen is the most abundant protein in the human body and a major component to construct our extracellular matrix. Recent studies indicate that in many types of tumors, collagen fiber alignment at the tumor boundary correlates with poor prognosis in patients. Tumor invasion is now considred as the outcome of a complex interplay between cancer cells and the stromal environment, while some studies suggested that collagen has an extraordinary role in triggering chemical signals that help protect the body from cancer. An *in vivo* noninvasive imaging system to diagnose and score for collagen alignment at the tumor interface that correlates with prognosis is thus critical. In this talk, we present an *in vivo* noninvasive imaging system which diagnoses and scores for collagen alignment at the tumor interface in patients. This system is a multi-harmonic genration microscope powered by a Cr:forsterite laser, which maximizes the penetration depth in human skin while minimized all possible photodamages. The second harmonic signals were used to image collagen fibrils while the third harmonic signals were used to image the keratinocytes, for differential pathological diagnosis. Imaging processing algorithms were developed so as to score the collagen structures and alignment at the tumor interface. Studies on 60 patients with/without pigmented tumors, including basal cell carcinoma, will be reported. This first *in vivo* clinical study not only reveals the interaction between tumor and collagen, but also justifies the effectiveness of this imaging tool to diagnose cancer noninvasively in real time.

Biography

Chi-Kuang Sun received his PhD degree in applied physics from Harvard University in 1995, and was an assistant researcher in the UCSB QUEST Center, from 1995 to 1996. In 1996, he joined National Taiwan University, where he is now the Y.-Z. Hsu Science Chair Professor of photonics and optoelectronics and the founding director of Molecular Imaging Center. His research focuses on nano-acoustics, femtosecond optics, THz optoelectronics, and biomedical imaging. He is the author of more than 200 SCI journal papers and 500 conference proceedings. He is a fellow of OSA, SPIE, and IEEE.

sun@ntu.edu.tw

Notes: