Since the autofluorescence of the biological tissue reflects the metabolic status of the tissue, it could be used as an indicator for early cancer diagnose [1-2]. So far, most confocal imaging techniques focused only on one modality. In this study, we built a multi-modality confocal imaging system to simultaneously obtain the tissue’s reflectance and autofluorescence signals in vivo. Through the multimodality Confocal Reflectance/Auto-Fluorescence Tomography (CRAFT) system, nude mice skin with cancerous sites and normal skin sites were imaged with the system and the 3-D construction of the tissue was obtained. We compared the reflectance and fluorescence signal intensities from the tissue. A 1.6x cell counting result on the cancerous site indicates a stronger concentration of melanin and packed cell size. With the decay coefficient analysis, the corresponding NAD(P)H decay index for cancerous sites is 1.65-fold that of normal sites, leading to a 97.8% of sensitivity and specificity for early cancer diagnosis [3]. As it can simultaneously collect reflectance and autofluorescence confocal image from different layers of the tissue, CRAFT may serve as a novel in vivo, non-invasive diagnostic method for early cancer diagnosis.

References