2D and 3D Imaging of Breast Cancer and Lung Alveoli

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2D and 3D images due to refraction of breast cancer specimen and lung healthy specimen have been successfully observed. A novel system Dark-field Imaging (DFI) has been applied to visualize human breast cancer and lung alveoli specimen with 5 micrometer spacial resolution and high contrast resolution in 2D form.   An example of DFI image of breast cancer is shown in Fig.1.

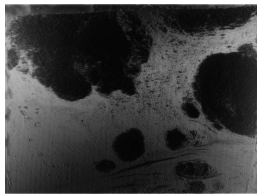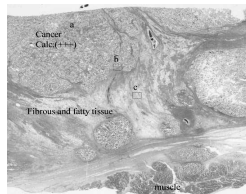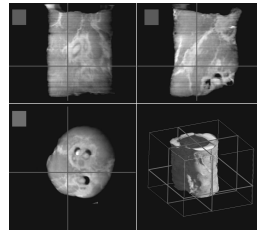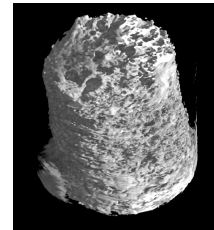Fig.1   Fig.2   Fig.3 (a)   Fig.3 (b)

Fig.1. DFI image of breast cancer specimen. This sample is micro papillary carcinoma, which involved lactic duct. Its view dimension is 2.5 mm in square which is a part of a specimen with size of 26 mm (width) x 22 mm (height) x 2.8 mm (thickness). Obtained image showed very high contrast.

Fig.2. Pathological image of the neighbouring region of the same sample as for the DF image in Fig. 1 with the same scale

The algorithm for 3D reconstruction of X-ray image due to refraction has successfully achieved recently. That was applied to 2 kinds of human tissues, one breast cancer and the other lung alveoli. Both rod shaped specimens have the size of 3.5 mm in diameter and 4 mm in length. Their marvelous results are shown in Fig. 3 (a) and (b).