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Editorial

Advances in Optical Biopsy for Cancer Diagnosis

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The section of April issue of TCRT, devoted to Optical Spectroscopy, focuses on advances made in the Optical Biopsy field. Scientists from around the world submitted articles on their recent research in this field. The promise of diagnosis in real time utilizing Optical Biopsy methods became close to clinical use as a result of multiple studies. Optical Biopsy currently is the only method that gives diagnostic information on cancer without removing tissue from body.

The papers encompass several different spectral and imaging technologies extending from the macro- to the micro-scale using fluorescence, Raman scattering, elastic light scattering and vibrational spectroscopies, and biophotonic approaches to detect cancer. The papers highlight the potential of Optical Biopsy techniques to offer solutions in many different areas of clinical interest in *in vivo* diagnosis in the operating room and continuous monitoring during recovery. A number of papers on Stokes Shift Spectroscopy for cancer diagnosis have shown potential not only by *in vivo* examination of specimens but also using urine and blood samples. In particular, the area of native fluorescence spectroscopy was used to evaluate chemotherapeutic effect on malignant cells by means of mathematical Nonnegative Matrix Factorization algorithm (1); models using optical methods for cancer diagnostics by reflectance and fluorescence spectroscopy were evaluated for their potential to aid cancer detection in a quantitative, minimally invasive manner (2); the spectral changes of micro-metastases and individual metastatic cells of lymph node tissues associated with cancer were summarized (3); the detection of cancer by optical analysis of body fluids using Stokes shift spectroscopy was evaluated for detection of cancer in the body from blood plasma and urine (4); the diagnostic potential of Stokes shift spectroscopy for breast and prostate cancerous tissues was presented as a new spectroscopic method, which combines both absorption and emission (5); and *in vivo* real time diagnosis of esophageal cancer using Raman endoscopy and biomolecular modelling is presented for clinical examination (6).

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