Photoacoustic Spectroscopy in Ovarian Cancer Diagnosis: an *Ex Vivo* Experimental Study

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The present study reports ovarian cancer diagnosis using pulsed laser induced photoacoustic spectroscopy (PLPAS). The photoacoustic (PA) transients of the normal and abnormal ovarian tissues were recorded using a home made photoacoustic cell, by exciting the tissues with 325 nm pulsed laser light and detecting with PZT detector. The sensitivity of the technique was evaluated by extracting 5 different statistical features like, mean, median, standard deviation, maximum intensity, and the spectral residuals from different PA transients of normal, benign and malignant tissue samples and conducting suitable statistical analysis with them. These features as well as statistical analysis with them have shown consistent values for a particular type of tissue and were found inconsistent for different types of tissues. We have also tried to correlate the origin of the complex photoacoustic transients of the ovarian tissues under study with the cavity modes of the PA cell. Since the PA cell is essentially a resonant cavity, the signal characteristics in it can be best interpreted in terms of its resonant frequencies. The resonant frequencies of the cavity modes of the tube were calculated and were found to be in close agreement with the experimentally observed results. The phenomenon of standing waves generation in a cuvette containing tissue sample in the PA cell forming the resonant cavity was viewed as a cylindrical tube with one end open and the other end closed. The results of this study will be presented and discussed during the symposium.