



## Substantial Role of Infrared Spectroscopy in Lung Cancer Detection

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### Editorial

Exploration of innovative approaches for *ex vivo* and *in vivo* diagnosis and imaging of cancer has resulted in the technological advances that has improved and prolonged human condition and life. Worldwide, lung cancer is foremost reason behind cancer related deaths in human males and females (after breast cancer) and is generally divided into non-small cell lung cancer (80%) and small cell lung cancer (20%). It has overall survival rate of five years and often visible when reaches an advanced or invasive stage, hence, very difficult to cure. Therefore, identifying lung cancer in its early stages, when it's only few cellular layers thick and difficult to be detected through conventional methods (chest X-ray, bronchoscopy, computed tomography, positron emission tomography and magnetic resonance imaging), can be a significant element in increasing the survival probability of patients [1, 2]. Infrared spectroscopy facilitates molecular signatures from biological tissues on the basis of their chemical composition and can detect any change in the biochemistry with high precision. No sample preparation is needed thereby reducing the requirement of tissue samples for clinical investigations. As, it is a fast and less invasive method of analyzing biomolecular constituents, hence, enables the detection of early onset of lung cancer. Several research studies have revealed its competence both qualitatively as well as quantitatively to identify markers associated with pre-malignant and carcinogenic change in a lung tissue [3]. Further, it has shown to provide information related to classification, grading and progression of the disease. Also, when conjugated with multivariate spectral analysis, the accuracy of differentiation between the cancer stages can be enhanced. Significant evidences have proven its (infrared spectroscopy) ability to comprehend the biochemistry of a cell/tissue in normal and diseased state, however, the automation of this technique to complement cytological or histopathological analysis needs attention and require optimized sampling protocols that has been a challenging task till date [2,3]. Automated clinical diagnosis via infrared imaging or mapping coupled with spectral analysis at depth will add new possibilities and can also benefit the pathologists in terms of sorting of samples (normal versus malignant) that will indirectly reduce their burden. The utilization of a spectroscopic method (imaging and spectral analysis) along with existing conventional method can significantly improve the detection lung cancer. Further, detailed understanding of interaction between light photons and a living tissue is a must. Again, continuous developments in the statistical analysis methods such as chemometrics in real time to process the large number of datasets can be advantageous in making infrared spectroscopy, a diagnostic tool of clinical relevance [1-4].

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