

## **P43. PROTEINS SECONDARY STRUCTURES CHANGES IN PLEURAL FLUIDS DUE TO ASBESTOS-INDUCED LUNG CANCER**

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Exposure to asbestos is carcinogenic to humans. Occupational and/or environmental exposure to asbestos can lead to the development of Malignant Pleural Mesothelioma (MPM). The main symptom of MPM is the accumulation of pleural fluid around the lungs. However the accumulation of pleural fluid could be due to other kinds of diseases such as inflammation. In order to identify whether the pleural fluid is due to MPM or other benign diseases, the details of pleural fluid's proteins content and their secondary structure has been studied using Attenuated Total ReflectionFourier Transform Infrared (ATR-FTIR) spectroscopy. For the analysis of proteins secondary structure from FTIR spectra, the amide I region(1700-1600 cm<sup>-1</sup>) was used.Wavelet analysis has been used to extract the Amide I spectral features.The extracted features were used as inputs for a previously trained Artificial Neural Networks (ANN) using protein infrared spectrato estimate protein secondary structure. The results show an overall increase of the protein content on the pleural fluid accumulated due to MPM relative to other benign diseases.Furthermore, an increase of  $\beta$ -sheet structure in the MPM pleural fluidwas found. This result could be attributed to an increase in proteins with  $\beta$ -sheetstructure and/or conformational changes resulting in increase of  $\beta$ -sheet structure of MPM pleural fluid.This study showed thatATR-FTIR spectroscopy in combination with a suitablefeatures extraction and classification methods can be a novel and rapid diagnostic method to differentiation of MPM from other benign diseases.