

Analyses of the Fourier Transform Infrared Spectra of Pleural Mesothelioma Tissues*

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Eleven cases of pleural mesothelioma and two cases of pleural normal tissue were detected using Fourier transform infrared spectroscopy. The differences between pleural mesothelioma and normal pleural tissues identified by comparison of their respective Fourier transform infrared spectra were as follows: (1) a higher relative intensity of the protein amide I band at 1641 cm^{-1} for pleural mesothelioma compared to normal pleural tissues, a pointed peak of amide II band at 1550 cm^{-1} for pleural mesothelioma, and a higher relative intensity compared to normal pleural tissues, all relating to increased protein content in pleural mesothelioma; (2) a symmetric stretch of the vibration band of phosphodiester bonds in the nucleic acid molecules of pleural mesothelioma towards the long 1240 cm^{-1} wave, and a higher relative intensity compared to normal pleural tissues, indicating increased nucleic acid content of the pleural mesothelioma; (3) a lower relative intensity of the absorption peak near $2854\text{--}2922\text{ cm}^{-1}$ in the pleural mesothelioma compared to normal pleural tissue, indicating reduced lipid content of the pleural mesothelioma; (4) a lower relative intensity of the absorption peak near 1047 cm^{-1} associated with soluble sugar content of the pleural mesothelioma compared to normal pleural tissues. Our results show that Fourier transforms infrared spectra exists differences between pleural mesothelioma and normal pleural tissues. It is expected to become a new method for rapid identification of pleural mesothelioma.

Key words: Pleural mesothelioma, Fourier transform infrared spectra (FTIR), Protein, Nucleic acid, Lipid, Sugar.

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