Preliminary FTIR analysis of cancerous cells

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Cancer disease is a one of the major civilization diseases all over the world. The prevalent form of this affection among men is prostate cancer while among women is breast cancer. Since the pathogenesis of cancer is still unknown it seems to be very relevant to deliever studies providing more knowlegde of this disease[1]. Tissues collected during biopsy have complicated structure, containing various types of cells (cancerous and non-cancerous one), therefore there's a need to analyze culture cells which are representing a homogenoius material. FTIR technique gives a very good opportunity to identify chemical structures at cellular level [2]. In this study different types of culture cell lines such as: DU-145, PC-3, LNCaP (prostate cancer), T47d (breast cancer) and WM-793 (melanoma) [3] as well as some organic standards: albumin, ovo-albumin and L-cysteine were analyzed. Furthermore, prostate cells were fixed with different reagents: paraformaldehyde with PBS, glutaraldehyde with PBS and PBS alone. This was done in order to study the influence of the preparation technique on the spectra obtained.

Cells were prepared for measurments on 3,5 μm Mylar foil while the standards were prepared according to the KBr technique. The measurments were performed at the SINBAD (Synchrotron Infrared Beamline At DAΦNE) in Frascati, Italy and at University of Science and Technology, Kraków, Poland. The study was basically focused on the analysis of Amide I and Amide II bands in the region of 1000–1700 cm^{-1} likewise CH_2 and CH_3 stretching bands in the region of 2800-3000 cm^{-1}. As the results of this study the comparision of characteristic IR bands between different type of cells as well as the influence of the preparation technique will be presented and discussed.

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