

Identification of Drug Resistant Melanoma Cell Lines Using Vibrational Spectroscopy

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The major limitation to the successful treatment of malignancies is the emergence of drug-resistant tumor cells [1]. We investigated the ability of FTIR-Microscopy to define spectral changes between drug sensitive and drug resistant human melanoma cells. As a model system, a resistant melanoma cell line (GAC) was selected with cisplatin from parental (GA) cells as described by Brkic et al. [2]. By applying the principal component analysis (PCA) model, we reduced the original data size to six principal components. Figure 1 shows a good classification between resistant (red +) and sensitive (blue *) cells. It can be achieved by using PC1 vs. PC3 (a) and 3D plots presenting PC4 in addition to PC1 and PC3, indicating a clear distinction between the two groups (b).

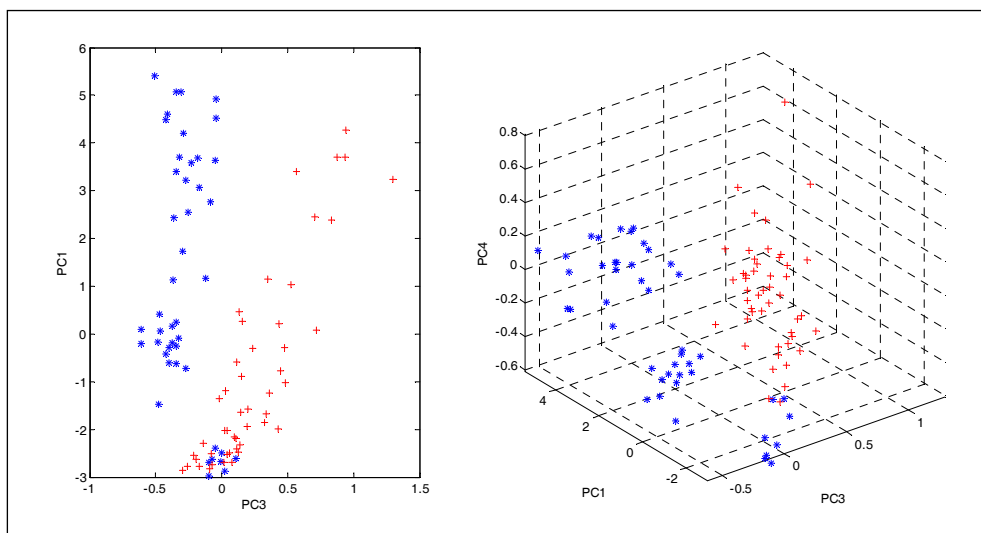


Fig. 1: Principle Component Analysis (PCA) model

Our preliminary results show that it is possible to obtain an estimate of the classification between these two cell lines. Due to its ability to provide detailed information at the molecular level [3] FTIR microspectroscopy has the potential to emerge as a simple, method for the identification of drug-resistant cells. Rapid detection of tumors resistant to a particular drug, should contribute to the ability of the physician to choose an effective treatment protocol.

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