THE CHEMICAL SPECIES OF SULPHUR IN PROSTATE CANCER CELLS STUDIED BY XANES

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Keywords: XANES, prostate cancer, sulphur
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The role of sulphur in prostate cancer progression may be significant for understanding the process of carcinogenesis. This work, based on XANES spectroscopy, is focusing on determination of sulphur chemical species occurring in prostate cancer cell lines. Changes in the ratio of oxidized and reduced sulphur forms may indicate changes in redox balance due to the oxidation stress. Oxidation stress, the biochemical condition characterized by an imbalance between cellular oxidizing and reducing species, provides unusual oxidizing conditions in vivo, characterized by the presence of reactive oxygen species that can cause oxidative damage to biomolecules [1]. Such a damage may lead to carcinogenesis and that is the reason of this type of studies.

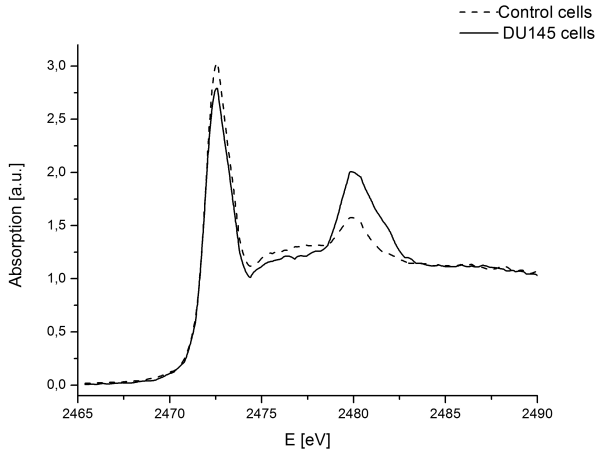

Figure 1: The k-edge XANES spectra of sulphur obtained from DU145 cells and control cells.

The experimental material consisted of four commercially available cell lines: three from metastasized prostate cancer (PC3, LNCaP, DU145) and one from the peripheral zone of the prostate, used as a control (PZ-HPV-7). The experiment was performed at the SUL-X beamline of the synchrotron radiation source ANKA, Karlsruhe (Germany). The K-edge XANES spectra of sulphur were analysed in order to establish sulphur species that occur in prostate cancer cells and whether there are any differences between their content in the various cell lines. As an example the comparison between XANES spectrum from DU145 and control cell lines is presented in Fig. 1.

The results obtained are discussed in terms of the differences in cells morphology and sulphur biochemistry.

Acknowledgments: The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007 – 2013) under grant agreement n° 226716 (proposal BIO-12). We acknowledge ANKA for support and granting beamtime in the proposal BIO-12.

References

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