

**Comparison of Individual Radiosensitivity of PBL from Prostate Cancer Patients and Healthy Donors**K. Brzozowska<sup>a</sup>, A. Wojcik<sup>b</sup>, R. Kriehuber<sup>a</sup> and S. Schmitz<sup>a</sup><sup>a</sup>*Forschungszentrum Juelich GmbH, Wilhelm-Johnen-Strasse, 52425 Juelich, Germany;*<sup>b</sup>*Stockholm University, Department of Genetics Microbiology and Toxicology, Svante Arrhenius väg 16E, room 515, 10691 Stockholm, Sweden**sa.schmitz@fz-juelich.de*

Individual radiosensitivity is a biological feature distributed heterogeneously within the population. Approximately 10 % of people have an enhanced intrinsic radiosensitivity and hence a higher risk for developing side effects during radiotherapy. The underlying mechanisms remain unclear. DNA repair deficiency and altered apoptosis characteristics are discussed to be markers for radiosensitivity that can easily be analysed in peripheral blood lymphocytes (PBL). The aim of our study is to find out whether PBL from cancer patients with strong clinical side effects under radiotherapy, as assessed clinically on the basis of the RTOG/EORTC scale, show enhanced rates of double strand breaks (dsb), decreased DNA repair capacity and altered induction of apoptosis in vitro when compared to lymphocytes from patients without side effects and age-matched healthy donors. Additionally, to investigate whether the in vitro radiosensitivity of PBL is a marker of prostate cancer predisposition the data of patients are analysed versus the data of PBL collected from healthy donors. To achieve this goal blood samples are collected, exposed to a dose of 1 Gy or 0.5 Gy and the following biological endpoints are analysed: the initial level of dsb and the repair kinetics ( $\gamma$ -H2AX-Assay), apoptosis (Annexin V-Assay) and the induction of chromatid-type chromosomal aberrations (G2-Assay). Preliminary results reveal that the maximum induction of foci as measured by  $\gamma$ -H2AX-Assay occurs 30 min after irradiation. 24 h after irradiation the amount of foci declines to approximately control level. FACS data confirm these findings. First results derived from the Annexin V-Assay show a significant increase of early apoptosis 24 h after irradiation compared to the controls.