## **EUROPEAN RADIATION RESEARCH 2012**



Contribution ID: 18

Type: poster preferred

## Effect of radiotherapy conditions on biological response of normal and cancer cells

Thursday, 18 October 2012 16:42 (1 minute)

Jacek Rogoliński1, Maria Konopacka1, Aleksandra Rusin 1, Krzysztof Ślosarek2

Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology, Gliwice, Poland

1Center for Translational Research and Molecular Biology of Cancer 2 Department of Radiotherapy and Brachytherapy Treatment Planning

Cancer radiotherapy regimens use radiation of varying dose rates (100 –600 MU/min). We tested whether irradiation of cell cultures at the same dose but different dose rate, at different medium depths, in the beam axis or off the irradiation field will generate the same extent of damaged cells.

The study was carried out using two cancer cell lines (A549 and HCT116) and one normal line (BEAS-2B). As a radiation source Cliniac 2300 accelerator was used, delivering photon radiation (6 MV). 5 Gy dose was used (at 100 and 600 MU/min dose rate); cells were placed in a water phantom at two depths (3 or 15 cm), either within or outside of the irradiation field.

Biological damage was assessed as: micronuclei frequency, apoptosis induction, cell survival and cell senescence.

Dose rate: The radiation, at the same dose, when delivered at a lower dose rate, induces a higher degree of biological damage than radiation of greater dose rate. This relationship is observed only within the beam field. Depth: At a greater depth more cytogenetic damage is observed for the same dose, as compared to smaller depths.

Positioning: Cells placed outside of the irradiation field are damaged to the same extent irrespective of depth and dose rate.

Cell survival: Cell survival determined by MTS assay after 48h elapsed from irradiation did not differ between treatments (cells placed at different depths: 3cm or 15 cm in a water phantom and irradiated with different dose rates: 100 Gy/min or 600 Gy/min) and was altered as compared to untreated control. Type of cells: These observations pertain to neoplastic and normal cell types.

It was found that biological response of cells for the same dose depends on various exposure conditions of radiotherapy (dose rate, depth of medium, positioning with respect to axis).

The observations presented herein can be used in the future for radiotherapy planning.

**Primary author:** Dr ROGOLINSKI, Jacek (Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology)

**Co-authors:** RUSIN, Aleksandra (Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology); ŚLOSAREK, Krzysztof (Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology); KONOPACKA, Maria (Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology)

**Presenter:** Dr ROGOLINSKI, Jacek (Maria Sklodowska-Curie Memorial Cancer Center and Institute of Oncology)

Session Classification: Poster Session 3

Track Classification: Modulation of Radiosensitivity