EUROPEAN RADIATION RESEARCH 2012



Contribution ID: 39

Type: oral (travel award)

Telomere length does not correlate with radioresistance in human TK6 limphoblasts

Thursday, 18 October 2012 14:30 (15 minutes)

Many and differents are the proposed mechanisms leading to resistance to ionizing radiation treatment. Among them, an inverse relationship between telomere length and radioresistance has been recently advanced. Investigating such a relationship in TK6 lymphoblasts, we found that clones originating from cells survived to 4 Gy of X-rays showed a significantly higher telomere length if compared with clones grown from untreated cells. The lengthening observed was not attributable to a radiation-induced increase in telomerase activity as demonstrated by TRAP assay performed in the dose range of 1-10 Gy. Given the evidence that TK6 whole population was characterized by heterogeneity in cellular mean telomere length, we tested the hypothesis that a process of selection may favourite cells with longer telomeres (more radioresistant cells) following exposure to irradiation. In order to do it 15 independent TK6 clones were selected and characterized by long telomeres and four characterized by short telomeres were tested for their radiosensitivity by means of clonogenic assay and D0s obtained were compared with D0 of the whole population. The results obtained showed that, in our experimental conditions (cell model, radiation doses and telomere lengths) no significant relation was observed between D0 and telomere lengths. Overall, these results led us to reject the initial hypothesis and to exclude a relevant role played by telomere length in the phenomenon of radioresistance.

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Session Classification: Awardees 1

Track Classification: DNA Damage and Repair