



Contribution ID: 167

Type: Poster

Effects of monochromatic synchrotron X-rays irradiation on functionalised gold nanoparticles treated prostate cancer cells

Thursday, 26 November 2015 13:30 (20 minutes)

The concept of using gold nanoparticles for enhancement of radiation therapy appears to be promising approach for improved cancer treatment. As gold is an excellent absorber of X-rays, the cells loaded with gold nanoparticles receive higher dose when compared to the untreated cells. This improved radio sensitization effect allows enhanced radiation induced cell death and minimises the dose of radiation treatment there by reducing adverse side effects of cancer. Recently, we have shown that epigallocatechin-gallate (EGCg) functionalized gold nanoparticles, selectively bind with excellent affinity to Laminin67R receptors, which are over expressed in prostate cancer cells thus allowing the targeted delivery of nanoparticles to the cancer cells.

In this study, we propose to investigate the radio (X-ray irradiation, 0-12 Gy) sensitizing effect of functionalised gold nano particles on prostate cancer cells (PC-3) using clonogenic survival assays. The data from the clonogenic assays will not only enhance our understanding on role of EGCG led targeted mechanism in gold nanoparticles and monochromatic X-ray mediated cancer cell death. But it also demonstrates the efficiency of EGCG stabilised gold nanoparticles in X-ray does enhancement selectively in cancer cells.

References

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Keywords

Synchrotron X-rays, Gold nano particles, EGCG, Radio therapy

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Session Classification: Poster Session 1

Track Classification: Radiotherapy and Radiobiology