

TITLE

**Gold nanoparticles
as radiosensitisers
for various
radiotherapy beams**

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Ionising radiations has wide applications in medicine including treatments “radiotherapy”. One of the main issues in radiotherapy is the exposure of healthy structures existing between the beam entrance and the target and those beyond and on the sides of the target. Therefore, radiotherapy-procedures always strive to enhance the effects of radiations at the targets. We pioneered in canvassing methods to achieve the above aim by using gold-nanoparticles as potential radiation sensitising agents. Our investigations are conducted through cell culture studies and are followed by many other studies from researchers from around the world. These studies concludes that optimal dose enhancement by gold-nanoparticles at low-energy x-rays is achievable with low concentrations of gold nanoparticles. The effects of gold nanoparticles on radiation dose will be discussed and a new way of quantification of such effects will be presented. This method stems from radio-biological effects. Dose enhancement by gold-nanoparticles is tested using synchrotron generated microbeams, which are expected to be applied for treatment of highly radiation-resistance gliomas. Microbeam of mean energy 125 kev generated by the Spring8 synchrotron in Japan was used.

These studies also demonstrate that inclusion of gold-nanoparticles in cells accelerates their migration towards the radiation-eradicated areas. Acceleration of cells gap-filling is not well understood, however it can be attributed to various biological processes. Moreover, it is also observed that; glioma-cells fill gaps in slower rates compared to the normal endothelial cells. This is consistent with the aims of microbeam radiotherapy techniques.

In conclusion; gold-nanoparticles enhances radiation-doses significantly and accelerates cells-migration.

Biography

Moshi Geso has completed his Ph.D at the age of 30 years from University of California at Los Angeles and worked as Medical scientist at RMIT University in Australia since then. He is the associate professor of physics at the discipline of Medical Radiations- School of Medical Sciences. He has published more than 55 papers in reputed journals in this field and serving as an editorial board member of one reputable journal.