

# Gold nanorods as radiosensitizer agents on PC3 cells

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## Abstract

Different structures of gold nanoparticles (AuNPs) are being extensively used in Radiotherapy (RT) because gold increased the sensitivity to radiation due to its high atomic number that can absorb high-energy gamma rays or X-rays and emit photoelectrons, Auger electrons, Compton electrons, and fluorescence photons.<sup>1</sup> Gold nanorods (AuNP<sub>r</sub>) are gold nanoparticles with a rod shape, used to enhance the effect of ionizing radiation.<sup>2</sup>

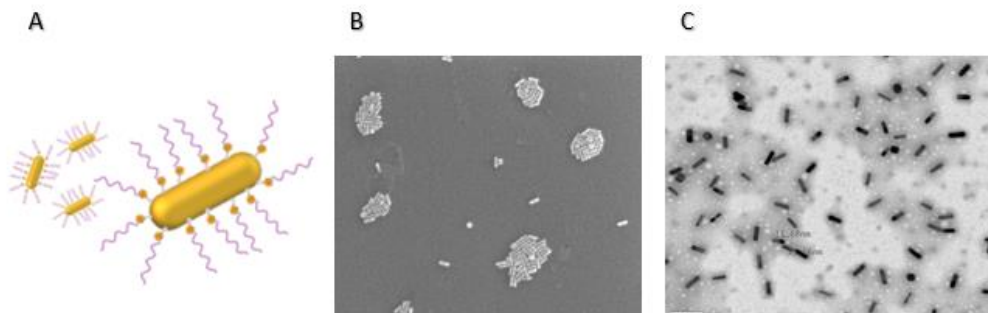
After synthesized, the effect of the AuNP<sub>r</sub> on radiosensitization using megavoltage energies RT was evaluated for in PC3 prostate cancer cell line (PCa). Cells were incubated with different concentrations of AuNP<sub>r</sub> (0-1.0 mM) during 24h, then subjected to irradiation of 2,5 Gy per fraction, for 3 days, using a PRIMUS linear accelerator with 6 MV photon beam. After RT treatments, cell viability was analysed using PrestoBlue assay (*Invitrogen*<sup>TM</sup>), cell migration was explored doing the *in vitro* wound healing assay, and colonies assay was evaluated by microscopy.

In this work, we found that the AuNP<sub>r</sub> displays a radiosensitization effect and it is dose dependent in PC3 cell line. These results are supported by decrease of viability and number of colonies produced.

## REFERENCES

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[2] Ma, N.; Wu, F.-G.; Jiang, Y.-W.; Jia, H.; Wang, H.-Y.; Li, Y.-H.; Liu, P.; Ning, G.; Chen, Z., Shape Dependent Radiosensitization Effect of Gold Nanostructures in Cancer Radiotherapy: Comparison of Gold Nanoparticles, Nanospikes, and Nanorods. *ACS Applied Materials & Interfaces* 2017, 9.



**Figure 1:** Scheme of AuNP<sub>r</sub> with PEG, Scanning electron microscope (SEM, 200000x) and Transmission electron microscopy (TEM, 150000x) images.