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Gold Nanoparticles Size Effects on Radiation Therapy Enhancement for Cancer cells BINDESHWAR SAH, JING WU, MICHAEL ANTOSH, Univ of Rhode Island — Radiation therapy is one of the most convenient techniques used for cancer treatment. Radiation therapy can harm both healthy and cancerous cells. The main aim of radiation therapy is to enhance the radiation effect on cancer cells while minimizing effects on near healthy cells. Gold nanoparticles are versatile materials for biomedical applications because they are relatively inert, stable and easily synthesized, which lead to the high absorption coefficient. The objective of this experiment is to investigate how the size of gold nanoparticles in radiation therapy affects cancer cell survival. This experiment used JC mouse breast cancer cells for an in vitro experiment, which were treated with gold nanoparticles and X-rays of varying sizes. The cells were treated with the same mass concentrations (0.167 g/mL) of the different sizes of the gold nanoparticles (5, 15, 30, 50 and 100 nm) with multiple radiation energies (100, 250 and 350 kVp). The survival assays showed the radiation effect on cancer cell survival comparing the treatment sizes of gold nanoparticles. The results indicated that each size treatment of gold nanoparticles except for 5 nm showed significant decreases in cancer cell survival. The 50 nm of gold nanoparticles treatment had the strongest radio-sensitization

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