Effect of annealing on the Cytotoxicity of Upconversion Nanoparticles in Different Cell Lines

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Carriers based on upconversion nanoparticles (UCNPs) and cyanine dye are suitable for theranostic application in oncology, although care must be taken for selection of the surface coating material, UCNP surface charge, size, and dosage of the material. Investigation of influence of annealing temperature of particles on the upconversion luminescence properties and cytotoxic effect are relevant. The present work demonstrates the assessment of cytotoxicity UCNPs unannealed and annealed at 550 ^{o}C on different normal and cancer murine cell lines *in vitro*. The cell viability is scored for cytotoxic effects of UCNPs at dark conditions. UCNPs provide a dose-dependent and time-dependent cytotoxic effect on all studied cell lines which was most pronounced for the Raw264.7 cell line. It is probably caused by the high phagocytic activity of macrophages. The statistically significant differences in cell viability after 24, 48 and 72 h of incubation of cells with particles were observed just for the macrophage cell line. It is also worth noting that annealed particles are less toxic than unannealed ones.

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