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Interaction analysis between polyvinylpyrrolidone (pvp) nanogels synthesized by gamma radiation and human neutrophils

Nanogels are extensively studied for diverse biomedical applications. One of the most relevant is the use as drugs nano-carriers for therapeutic purposes, increasing the bioactivity and transport of active components to specific sites or cells. Nanogels-based drug release formulations improve the effectiveness and safety of certain anticancer drugs and radiopharmaceuticals, minimizing its delivery and tumor accumulation problems associated with the existing traditional nuclear medicine agents. In the present work, the interaction of 30 nm Polyvinylpyrrolidone (PVP) nanogels with human neutrophils cells was evaluated. The analysis was performed using Nitroblue Tetrazolium microscopic and colorimetric assay, as an attempt to achieve the more comprehensive view of nanogel interaction with the main cells of the innate immune system. PVP nanogels synthesized by gamma radiation, and titanium oxide nanoparticles exhibited similar cellular activation through the low production of Reactive Oxygen Species (ROS). In contrast, PVP nanogels showed less cellular activation compared to the bacterial peptide fMLP. This result suggests PVP nanogels as good candidates for drug delivery systems.

Keywords: PVP nanogels, neutrophils, Nitroblue Tetrazolium, drug delivery systems

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