Preparation, Characterization and Analyses of Albumin Nanoparticles loaded with Aluminum Chloride Phthalocyanine (AlClPc)

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ABSTRACT

The developments of albumin-based nanocarriers, which are nontoxic, biocompatible and biodegradable, have been extensively studied for seeking new alternatives of the treatment for numerous diseases. The most relevant characteristic of these protein-based systems are its capacity of the selectively achieve the target cells within of the brain. These nanocarriers are proteins-based and have covalent bonds, which, consequently, can be rapidly degraded through the proteolytic cleavage process on the inside of the cells. Given the importance of these nanocarriers (DDS), we propose to develop such nanocarriers for the treatment of Central Nervous System (CNS) by incorporating a free and pre-encapsulated photoactive agent (aluminum chloride phthalocyanine AlClPc) in albumin nanoparticles (NpA) with a chemistry cross-linking method (CrossQ). This later has been optimized by varying some relevant parameters such as Hydrogenionic potential (pH), the stirring speed and the volume of crosslinking agent (glutaraldehyde). From Scanning Electron Microscopy, Atomic Force Microscopy and Zeta potential measurements, we have clearly shown that the elaborated nanoparticles have a smaller size with a spherical shape, are more homogeneous and have greater electronic repulsion (preventing their aggregation) compared to other synthesis methods allowing not only promising advances with the application of this technique in future to in vivo studies, as well as the availability, in the future, of a viable and low-cost drug for the treatment of CNS diseases. Preliminary results of rheological measurements with a new home-made magneto-opto-rheological cell of NpA incorporating magnetic nanoparticles are also presented.
REFERENCES

