Poster

Synthesis and characterization of polymeric nanoparticles and their application in anticancer therapy

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ABSTRACT

Motivation: Traditional and current chemotherapy used to treat cancer disease has always been characterized by the high prevalence of side effects. In order to avoid them, nanotechnology has raised as an acceptable solution to this problem by selectively targeting anticancer drugs to the tumoral cells. Within this project to antitumoral agents, tannic acid and amitriptyline, have been encapsulated in polymeric nanoparticles to allow their targeted delivery. Amitriptyline is a tricyclic antidepressant whose antitumoral activity against lung cancer was recently described [1], and this agent could be a good approach for treating other tumoral diseases.

Methods: Tannic acid nanoparticles (TA) were synthetized according to a method previously described by our group [2], and PLGA-amitriptyline nanoparticles (PLGAMI) by emulsion solvent evaporation method. The so-obtained nanoparticles were characterized by dynamic light scattering (DLS), scanning electron microscopy (SEM) and FTIR spectroscopy.

Results: Both nanoparticles, TA and PLGAMI, are small and spherical. TA nanoparticles showed a mean diameter of 60 nm (SEM), a hydrodynamic diameter of 500 nm and a zeta potential of -22 mV (DLS). PLGAMI nanoparticles showed a mean diameter of 25 nm, a hydrodynamic diameter of 110 nm and a zeta potential of -8 mV. The presence of the antitumoral agents in nanoparticles was confirmed by FTIR spectroscopy, and the entrapment efficiency determined by colorimetric methods, using an UV-Vis spectroscope.

Conclusions: We have synthetized two polymeric nanoparticles bearing antitumoral agents as cargo. Our data confirm that these nanoparticles are suitable for continuing with the in-vitro assays, where we will compare the pro-apoptotic effect of both nanoparticles in cell cultures (H460 tumor cell line).

REFERENCES

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