Poster

Synthesis of Tannic Acid nanoparticles

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ABSTRACT

Motivation: Tannic Acid (TA) is a polyphenolic compound with a huge variety of biological activities. Most interestingly, it has anticancer activity through a variety of mechanisms, especially in those cancers that overexpress the epidermal growth factor receptor (EGFR). It has been demonstrated that TA is able to interact with EGFR/Jak2/STAT pathway and inhibit cellular proliferation induced by EGF, triggering apoptosis [1]. The aim of this work is to optimize TA polymeric nanoparticles previously developed by our group [2], with especial focus on diminishing their hydrodynamic diameter. This characteristic is extremely important, so that once the nanoparticle enters the circulatory system, it should be able to cross the vascular walls to reach the target tissue and then release the payload.

Methods and results: In this work it has been optimize the size of TA nanoparticles. The new nanoparticles obtained have been characterized by Infrared Spectroscopy, UV-Visible, Raman Spectroscopy, Tyndall Effect, Scanning Electron Microscopy (SEM) and Dynamic Light Scattering (DLS).

We have been able to diminish by a four-factor the hydrodynamic diameter. In this way, our nanoparticles have a hydrodynamic diameter of just 160nm and a zeta potential of -28mV. In addition, the entrapment efficiency is very high (92.2%), and we have simplified the synthesis procedure by reducing the number of steps and the amount of coating polymer of the nanoparticles.

Conclusions: We have optimized the size of TA nanoparticles. These nanoparticles have a suitable size for intravenous administration and extremely high entrapment efficiency. In addition, our synthesis does not require the use of organic solvents and the polymers used to construct the nanoparticle are classified as Generally Recognized As Safe (or GRAS) by the Food and Drug Administration.

REFERENCES

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