NOVEL CHITOSAN POLYMERIC MICELLES AS A DELIVERY VEHICLE OF HYDROPHOBIC ANTICANCER DRUGS

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**PURPOSE**

Chitosan (CS) is a natural polymer well known for its biocompatibility, biodegradability and mucoadhesive properties. Once CS has reactive groups in its backbone, it is easily used to be modified into amphiphilic polymers to produce polymeric micelles by self-assembly. Polymeric micelles (PM) have the ability to encapsulate hydrophobic drugs efficiently, as the case of many anticancer drugs as camptothecin (CPT), improving its water solubility and reducing its drastic side effects. Additionally, PM are stable drug delivery systems and can protect the drug against degradation upon its administration.

**AIM**

CS was chemically modified into an amphiphilic polymer with mPEG and oleic acid (OA) in order to encapsulate hydrophobic anticancer drugs, as CPT, by self-assembly.

**RESULTS**

- H\( ^1 \)NMR confirmed the success of the mPEG and OA grafting into CS backbone.
- FTIR showed the presence of amine groups as result of the carbodiimide reaction.
- A sustained and controlled release of CPT from mPEG-CS-OA micelles in simulated GIF was observed. Micelles protected CPT from hydrolysis up to 75% in simulated GIF. TEM microscopy showed round and smooth surface for both empty (left) and CPT-loaded (right) micelles.

**REFERENCES**

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**CONCLUSIONS**

- CS was successfully modified into an amphiphilic polymer.
- PM presented an average size around 140 nm and a positive surface.
- PM were able to protect CPT from hydrolysis up to 75% of its initial lactone form.
- CPT-loaded micelles improved significantly its in vivo intestinal permeability, as compared with free CPT.