COLL: Division of Colloid and Surface Chemistry

563 - Chitosan-coated BSA nanoparticles for oral delivery

View Session Detail

Joana Cunha[2]*, joanacunha@ceb.uminho.pt, Rui Lima*[1]*, Helena Sousa*[2]*, Artur Cavaco-Paulo*[2]

[1] University of Minho, Braga, Portugal; [2] Biological Engineering, University of Minho, Braga, Portugal

Abstract: Despite years of research, chronic pathologies, like cancer and chronic inflammatory diseases, are still in need of therapeutic approaches that allow easy administration, high compliance of the patient to the treatment and few or minor side effects. Engineered medicines, like surface-decorated nanoformulations, have the potential to accomplish all these important goals. However, oral administration of these formulations is a challenge due to the need to overcome the gastric harsh environment and be absorbed in the intestinal tract, reaching the blood flow as a whole functionalized particle.
We developed BSA nanospheres coated with chitosan and/or poloxamer 407 as mucoadhesive and mucopenetrant polymers. The formulations showed to be non-toxic to *Caco-2* cells in the tested concentrations. Stability assays in simulated digestive fluids showed differential profiles in terms of the size of the spheres coated with only one or with the two polymers and also in the amount of BSA that is released to the fluids, as measurement of spheres degradation. Preliminary results of *ex vivo* experiments with pig intestine showed the permeation of some material, however further improvements are being implemented in the analytic protocols.
The overall results point to need of using both chitosan and poloxamer 407 as coating for BSA nanospheres to be orally administered and reach the target tissues.