OCS7: New Approaches to Chronic Disease – Health and Environment

Moderator: Filipa Quintela Vieira (ESTSP.IPP)

OC28: Screening of the activity of quercetin-biapigenin and their poly(ε-caprolactone)-loaded nanoparticles in HepG2 cells

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Introduction: *Hypericum perforatum* extracts have been used for their antidepressive effects. A selected fraction (HP) containing quercetin and biapigenin proved to be neuroprotective. Liver is the organ primary responsible for compound metabolization and extremely susceptibility to toxic effects.

Objectives: This study aims to determine the hepatotoxic/protective activity of HP and HP PCL-loaded nanoparticles

Materials and Methods: Pure HP, containing mainly quercetin and biapigenin (1:1 w/w, HPLC-DAD) was obtained by isolation and purification method. HP PCL-nanoparticles were prepared by nanoprecipitation and extensively characterized. HP and its PCL-loaded nanoparticles assessment of cellular toxicity was performed by MTT assay (concentration range: 1-100 µg/mL). To study HP ability to protect $HepG_2$ cells against *t*-BOOH-induced toxicity two incubation regimens (pre and co-incubation) were used. To study the potential protective effect of HP and its nanoparticles against *t*-BOOH-induced lipid peroxidation co-incubation regimen was used.

Results and Discussion: Generally, HP showed increasing cytotoxicity, in a concentration dependent manner. In the higher concentrations tested, despite its toxicity, HP PCL-loaded nanoparticles were significantly less toxic than HP. Pre-treating $HepG_2$ cells with HP PCL-loaded nanoparticles revealed protective activity in all concentrations tested, in comparison with HP. When comparing with *t*-BOOH, HP PCL-loaded nanoparticles presented significant protective properties in lower concentrations. In the co-incubation regimen, HP revealed better protective activity than PCL-loaded nanoparticles in all concentrations tested. Effects of HP and its nanoparticles against *t*-BOOH-induced lipid peroxidation were coherent with the co-incubation MTT assay.

Conclusion: Assessed their activity in $HepG_2$ cells, HP PCL-loaded nanoparticles are good candidates for further studies. Taking into account HP antioxidant and neuroprotective properties, it is relevant to study the potential of these nanoparticles to reach brain-blood barrier and brain.

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References

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