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PROGRAMA / PROGRAMME
LIVRO DE RESUMOS / BOOK OF ABSTRACTS

Resumos dos Posters / Abstracts of Posters

P1

Prevention and treatment of diabetic retinopathy by natural antioxidant containing in chitosan-based nanomedicines

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Oxidative processes are critical factors in ocular conditions that may lead to pathologies such as Diabetic Retinopathy due to structural and functional modification of the tissues, apoptosis of capillary cells and retinal microvascular changes, making the loss of vision inevitable. Application of antioxidants may reduce apoptosis and restores partially functional tissues. Considering the multiple benefits of antioxidants in DR and that conjunctival drug permeability improvement is one of the major challenges in ocular drug delivery, the major topic of this work is to study the absorption capacity and consequent bioavailability of natural antioxidants incorporated in chitosan-based nanoparticles to prevent and treat DR. In this regards, it is proposed to characterize, quantify and compare the antioxidant potential of *Salvia* sp. and *Satureja montana* extracts and their main pure antioxidants: rutin, caffeic and chlorogenic acid. Then, antioxidant compounds are encapsulated into different chitosan-based nanoparticles, nanoparticles and release profile characterized and ocular permeation evaluated using *in vitro* cell models. Finally, the effect of antioxidant nanomedicines across human ocular is evaluated in diabetic animal after topical administration *in vivo*.

P2

Induction of Insulin Secretion and Antioxidant Protection in β -cells: Effects of *Catharanthus roseus* and compounds alone

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Diabetes mellitus type 2 is characterized by peripheral insulin resistance and impairment of insulin secretion. Beta-cells possess reduced levels of antioxidant defenses and, therefore, are more vulnerable to oxidative stress, which affects insulin secretion and ultimately results in cell death and loss of β -cell mass. HIT-T15 cells (hamster β -cells) were used here to study the potential of *Catharanthus roseus* (a plant traditionally used for its hypoglycemic potential) extracts and compounds to induce insulin secretion and protection against imposed oxidative stress. With this model we were able to reproduce the insulin secretion stimulatory effect of glibenclamide as measured by ELISA. In addition, oxidative stress induced by both *tert*-butyl hydroperoxide and 2-deoxy-D-ribose (dRib) negatively affected insulin secretion, which were prevented by the antioxidant NAC. Water extracts of *C. roseus* did not induced insulin secretion, contrarily to what have happened with some of its main flavonoids (aglycone) quercetin (Q) and kaempferol (K). Q also induced the levels of the intracellular antioxidant glutathione. Both flavonoids also protected against cell death induced by the sugar oxidant dRib. We conclude that HIT-T15 cells are a good model to study different types of damage in β -cells related with diabetes pathology, and possible protective effects of plant extracts/compounds.

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