O-06 - INCORPORATION OF PLGA NANOPARTICLES INTO GUAR-GUM FILMS AS A NEW BUCCAL DELIVERY

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Background
Buccal delivery offers several advantages over oral administration route, avoiding first-pass metabolism and extreme conditions that can lead to the degradation of bioactive molecules. The main goals of this work were to optimize the formulation of poly(lactide-co-glycolic acid) – PLGA – nanoparticles as carriers of an antihypertensive peptide (KGYGGVSLPEW peptide sequence) and incorporate them into the matrix of guar-gum oral films. This study allowed to obtain an optimized formulation of PLGA nanoparticles as tailored delivery systems for the antihypertensive peptide.

Method
PLGA nanoparticles (with and without peptide) were produced by a double emulsion technique evaporation method. PLGA nanoparticles physic properties were characterized by nanosizer instruments and the peptide delivery efficiency was monitored and quantified by HPLC. So, PLGA nanoparticles were optimized by Factorial Design. After optimized the nanoparticles were incorporated into guar-gum film matrix by solvent casting method. The nanoparticle into guar-gum film was characterized by physic properties and the efficiency delivery of peptide-loaded nanoparticles.

Results & Conclusions
The results showed peptide-PLGA nanoparticles had an average size of 125 nm and the zeta potential of -10 mV. The peptide-PLGA nanoparticles association efficiency was 60%.
Peptide-PLGA nanoparticles and Peptide-PLGA nanoparticles conjugated with guar-gum films showed significantly in vitro TR146 cell viability, as assessed by MTT assay. The incorporation of peptide-loaded PLGA nanoparticles into oral films led to a slower permeability across TR146 monolayer when compared with free peptide, films or nanoparticles alone. Results indicate that permeability of peptide across cells is directly correlated with peptide release from delivery systems and the peptide-loaded PLGA nanoparticles incorporated into oral films showed to be more effective as buccal delivery systems, promoting a slower and more extensive permeability. So, it is concluded PLGA nanoparticles will be valuable to deliver a bioactive peptides, to control release and to effectively protect encapsulated peptides. The combination of PLGA nanoparticles and guar-gum films showed a more effective delivery system.

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