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Poster 018

APATITE COATING ON COLLAGEN FILMS BY ALTERNATE SOAKING PROCESS

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The present study focused on the apatite coating on collagen films, with various different densities of carboxyl (-COOH) groups, using an alternate soaking process. From X-ray diffraction analysis, apatite was coated on anionic collagen or in native collagen films. Peaks ascribed to apatite were observed at 26 and 32° in the diffraction patterns of hydroxyapatite crystals. The amount of apatite coated on both collagen films continued to increase up to 100 reaction cycles. However, there is a significant difference in apatite coating between the two films. The amount of apatite formed on the surface of anionic collagen film increase 1.24 times faster than on native collagen film. The scanning electron photomicrograph images of the mineralized native and the anionic collagen films coatings, formed after 100 cycles, show that regular porous apatite coating had formed within the collagen fibrils. These results suggest that higher content of carboxyl (-COOH) groups, in anionic collagen, play an effective role in heterogeneous nucleation of apatite in the body environment.

Poster 019

PREPARATION OF CHITOSAN WITH CONTROLLED NANOPARTICLES SIZES

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Chitosan (CS) has recently gained more interest due to its applications in food and pharmaceuticals. In this work, chitosan nanoparticles were prepared by template polymerization of methacrylic acid in chitosan solution using different concentration of chitosan. The nanosize and morphology of chitosan nanoparticles were studied using Fiber Optic Quasi Elastic Light Scattering and Transmission electron microscopy measurements at different pHs. Results demonstrated that by increasing the amount of CS in the preparation medium the particle size decreases. Furthermore, the pH at which the nanoparticles are equilibrated has a strong effect on swelling and aggregation of the nanoparticles. The ionic interaction between COO- group of poly(methacrylic acid) and NH3⁺ group of chitosan, investigated by FT-IR spectra, is also discussed.

Poster 020

SWELLING BEHAVIOUR AND OF ALGINATE-CHITOSAN MICROCAPSULES PREPARED BY DIFFERENT REACTION PARAMETERS

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There has been increasing interest in the study on alginate-chitosan microcapsules, particularly on the preparation methods of microcapsules and characteristics of drug release. However, swelling degree and charge surface hydrogels are properties that deserve more attention, once affect the diffusion and release of drugs when the microcapsules are applied in drug delivery systems. In this work, alginate-chitosan microcapsules were prepared through ionic gelation, altering some reaction parameters such as Alginate content, pH, chitosan molecular weight and the hydrogels preparation method. These independent variables were evaluated on the particle size, swelling degree and surface charge properties. Results showed that microcapsules presented an average diameter of $5.9 \pm 2.0 \mu\text{m}$, independently of the reactions conditions. Using lower Alginate content and the indirect preparation method the hydrogels showed an inversion on the Zeta potential, presenting positive values. On the other hand, Alginate content and pH showed influence on swelling degree. These results indicated that the reaction conditions had a strong influence on morphology and microcapsules properties, and a careful design of these conditions could provide enhanced and specific properties for drug targeting.

Poster 021

PREPARATION AND EVALUATION OF ANTIOXIDANT EFFECT OF NANOCAPSULES CONTAINING QUERCETIN AND OCTYLMETHOXYCINNAMATE

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The goal of this study was to evaluate the antioxidant activity of quercetin (QUE) and octylmethoxycinnamate (OMC) loaded nanocapsules using a biological system composed of *Saccharomyces cerevisiae* cells. Hydrogen peroxide as a stressor agent. In this study, we prepared nanocapsules of (poly ϵ -caprolactone) (PeC) containing 1mg/mL of QUE by nanoprecipitation. We used the lipophilic solution contained OMC, QUE, and Span 60®/ Epikuron 170® in acetone. The aqueous phase contained Tween 80. The nanocapsules presented particle sizes between 208 and 315 nm and a negative zeta potential. The total QUE was higher than 90% and encapsulation efficiency close to 100% and all formulations prepared

with OMC presented contents higher than 90%. The QUE and OMC nanocapsules suspension showed an important in vivo antioxidant activity against the damages caused by a stressor agent that lasted for 35h. The longer bioactivity of those NC was probably related to the slowly release of the QUE.

Poster 022

DEVELOPMENT AND PHYSICO-CHEMICAL CHARACTERIZATION OF LIPOSOME AND CHITOSOMES DESIGNED FOR MELATONIN CUTANEOUS ADMINISTRATION

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The purpose of this study was to prepare melatonin-loaded liposomes (L) and chitosomes (Q) (chitosan modified liposomes) by reverse phase evaporation method and characterize the systems (pH, size, zeta potential, drug content, encapsulation efficiency) during 90 days of storage at room temperature and protected from light. Three different concentrations of melatonin (0.025, 0.1, 0.25%) were incorporated into the nanovesicles. It was observed a hydrodynamic diameter of particles lower than 244 nm in day 0 and until 90 days of storage the mean diameter of particles was stable. The zeta potential values were negative for all formulations. The melatonin-encapsulation efficiency ranged between 31.4% and 60.8%. The drug contents were stable for formulations containing 0.1 and 0.25% (L and Q) of melatonin during a period of 90 days. However, for formulations containing 0.025% of melatonin the drug content decreased after 3 months of storage.

Poster 023

PREPARATION, CHARACTERIZATION AND GASTROINTESTINAL TOLERANCE EVALUATION OF SODIUM ALENDRONATE-LOADED POLYMERIC MICROPARTICLES

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The aim of the present work was to prepare and characterize polymeric microparticles containing sodium alendronate using Eudragit S100® by spray-drying. The process yield was 52%, the encapsulation efficiency was 100% and the mean particle size was 21 μm presenting a Span value of 1.9. SEM analysis showed that microparticles are collapsed and presented smooth surface. Dissolution study showed that the drug was released in 150 minutes. Additionally, the microparticles presented a protective effect of the gastric mucosa of rats from the toxic effects of the sodium alendronate.

Poster 024

POLY (ϵ -CAPROLACTONE) NANOCAPSULES CONTAINING BENZOPHENONE-3: PREPARATION, CHARACTERIZATION AND STABILITY STUDYKarina Paese¹, Adriana R. Pohlmann^{1,2}, Sílvia S. Guterres¹¹Faculdade de Farmácia, UFRGS; ²Instituto de Química, UFRGS; CEP 90610-000, Porto Alegre, RS, Brazil – nanoc@farmacia.ufrgs.br

In this study, nanocapsules of poly (ϵ -caprolactone) containing benzophenone-3 were prepared by nanoprecipitation technique employing increasing concentrations of sunscreen. The formulations were monitored after preparation, 1, 2 and 3 months, determining the pH values, sunscreen concentrations (%), particle sizes (nm), polydispersities and zeta potentials. All nanocapsules formulations showed stability after 90 days of storage at room temperature.

Poster 025

CONDUCTING POLYMERS: SYNTHESIS, CHARACTERIZATION AND INTERACTION WITH BIOLOGICAL SYSTEMS

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p-Conjugated polymers, especially those based on polypyrroles and polythiophenes, have received significant attention throughout the course of the past two decades owing to a wide range of promising electronic, electrochemical and optical applications. Among the many polymeric materials that have been developed during this period, poly(3,4-ethylenedioxythiophene), PEDOT, is one of the most successful polythiophene derivatives because of its high conductivity and its unusual stability in the oxidized state. On the other hand, polypyrrole (PPy) is another promising conducting polymer, which exhibits high conductivity and good stability. PPy has been applied in batteries, chemical sensors, ion selective electrodes, and conductive coatings for nanomaterials. However, in the last years, the application of conducting polymers in biomedicine and biotechnology fields have been emerged. In this work, we investigate the interaction of polypyrrole and polythiophene deriva-