emerging technology exhibiting high sensitivity, selectivity and speed and may be most powerful tools for this application. In this study, human growth hormone (hGH) has been analyzed by various mode of capillary electrophoresis such as capillary zone electrophoresis (CZE), capillary gel electrophoresis (CGE), and capillary isoelectric focusing (cIEF) to indicate the chemically or biologically oriented variants and the degraded fragments. The two isoforms of hGH with slightly different pI value could be separated and identified by capillary electrophoretic focusing (cIEF), and the isoelectric points and the peak area ratio of the two isoform were confirmed. The impurities produced in aqueous solution during the storage period were characterized by capillary zone electrophoresis (CZE) and followed by MALDI-TOF mass spectrometry. In conclusion, the capillary electrophoretic method capable of identifying the chemically or biologically different variants of human growth hormone was developed and validated for investigation of the quality of hGH as protein pharmaceuticals.

[PE1-16] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

In Vitro Release of Acetaminophen from Mucoadhesive Microsphere Prepared by Poly(acrylic acid)/poly(vinyl pyrrolidone) Interpolymer Complex

Chun Myung-Kwan°, Cho Chong-Su, Choi Hoo-Kyun
Chosun University, College of Pharmacy and School of Agricultural Science and Biotechnology, Seoul National University)

Mucoadhesive microsphere was prepared by interpolymer complexation of poly(acrylic acid) (PAA) with poly(vinyl pyrrolidone) (PVP) using solvent diffusion method. The loading efficiency of acetaminophen into the microsphere was 91.3 ± 6.5%. The release rate of acetaminophen from the PAA/PVP complex microspheres was slower than that from PVP microspheres at pH 2.0 and 6.8. The dissolution of microspheres made of the complex was significantly slower than those made of PVP due to H-bond between PVP and PAA. As a result, the release rate of acetaminophen from the complex microspheres was slower than that from PVP microspheres.

[PE1-17] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

Modulation of P-glycoprotein Activity by Flavonoids and Organic Isothiocyanates in Human Uterine Cells.

Chung Soo Yeon°, Go Eun Jung, Lee Hwa Jeong
College of Pharmacy, Ewha Womans University. 11-1 Daehyun-dong, Seodaemun-gu, Seoul 120-750, KOREA

One of the possible mechanisms of multi-drug resistance found in cancer cells is the over-expression of P-glycoprotein (P-gp). Studies have shown that compounds found in plants including vegetables and fruits not only have anticancer activities but may also modulate P-gp activity. The effect of flavonoids and organic isothiocyanates on P-gp activity was studied in human uterine sarcoma cell lines, MES-SA (sensitive) and MES-SA/DX5 (resistant). The accumulation of daunomycin (DNM), a P-gp substrate, was approximately 10 times greater in the sensitive cell as compared to the resistant cells over the entire time course (up to 2 hrs). The positive control, verapamil increased the two hour accumulation of DNM while quercetin decreased that of DNM in the resistant cells. NITC (1-naphtyl-isothiocyanate) showed no effect on the two hour accumulation of DNM. The IC_{50} values for DNM in the resistant cells was about 20 times higher than that observed in the sensitive cells (10.1 ± 1.7μM vs. 0.58 ± 0.28 μM). Verapamil reduced the IC_{50} value for DNM whereas flavonoids (qeurcetin and fisetin) increased those for DNM in the resistant cells.

[PE1-18] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

Chitosan surface grafted with fusion protein of FGF-2 and Fibronectin-FGF for tissue regeneration therapy

Hwang Jeong Hyo°, Lee Jue Yeon, Kim Sun Chul, Jang Jun Hyeog, Ku Young, Chung Chong Pyoung, Lee Seung Jin
Department of Pharmacy, College of Pharmacy, Ewha Womans University, Seoul, Korea, Intellectual Biointerface

Engineering Center, Department of Periodontology, College of Dentistry, DRI, Seoul National University, Seoul, Korea

The biomedical applications of chitosan have been widely researched. FN mediates its biological effects through binding to the hetero-dimeric transmembrane glycoproteins, integrins, which physically couple the cytoskeleton to the ECM. FN binds to the integrin through a consensus site including the Arg-Gly-Asp (RGD) sequence within tenth type Ⅲ module (Ruoslahti & Pierschbacher 1987). A short sequence Pro-His-Ser-Arg-Asn (PHSRN) has also been identified as a synergistic motif within ninth type Ⅲ module for binding to α5β1 integrin (Aota et al. 1994). Through these interactions, integrins play a critical role in the regulation of cellular functions including cell adhesion, proliferation, migration and differentiation. In this study, the biological activity of protein-grafted chitosan was assayed by measuring the attachment of osteogeinc cell, *HOS*(Human Osteogenic Sarcoma). Chitosan grafted with FGF and FN-FGF fusion proteins, biomimetic polymer surfaces, could be provided as a good material for tissue engineering.

[PE1-19] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

In vitro and in vivo evaluation of meloxicam capsule

Park SeiYeon°, Park YoungJoon, Kang DaeSik, Lee HoChan, Kang Heui-Il
Yuhan Research Institute

Purpose. To develop a hard gelatine capsule containing meloxicam (Yuhan Meloxam capsule™), in vitro dissolution characteristics and bioavailability in beagle dog were compared with commercial product (Mobic capsule™). Methods. Meloxicam capsule™ was prepared by powder filling method using meloxicam, lactose, magnesium stearate, and others. The release of Meloxicam capsule™ and Mobic capsule™ were monitored by USP dissolution method under various dissolution conditions – dissolution medium (pH 1.2, 4.0, 6.8 and water). The paddle rotation speed was kept at 50 rpm. We estimated the similarity of dissolution profiles of two formulations by calculation of dissolution similarity factors(F2). The pharmacokinetics of two formulations was investigated after oral administration in healthy male beagle dogs. The blood samples were collected at scheduled intervals and the plasma concentrations of meloxicam were analyzed by HPLC method.Results & Conclusion. F2 values of two formulations were all above 50. The dissolution profiles of Meloxicam capsule™ were very similar to those of Mobic capsule ™. When orally administered to beagle dogs, the AUC $_{0\text{-}30}$, h/ml, 2.69 ± 0.29ug/ml, respectively. The relative□Cmax were 38.73 ± 7.02 ug bioavailability of the drugs from the capsule was 110.6 %, 122.7%, when estimated based on AUC $_{0\text{-}30}$ and Cmax , respectively.

[PE1-20] [2003-10-11 09:00 - 12:30 / Grand Ballroom Pre-function]

Electro-transport of Nicotinamide Adenine Dinucleotide Phosphate (NADPH)

Seung Yeon Lee°, Su Youn Kim, Jee Sun Youe, Seaung Youl Oh
Sookmyung womens university

Transdermal iontophoresis is a physical enhancement technique to facilitate the delivery of primarily charged molecules across the skin. Principal mechanism of iontophoresis is electrorepulsion experienced by the charged solutes under the application of a potential gradient. In this work, we have investigated several factors (concentration of NADPH, current density) that can affect the iontophoretic flux. We also studied the stability of NADPH in aqueous solution with/without various antioxidants such as butylated hydroxy toluene (BHT), resveratrol, tocopherol and Vitamin C. BHTand tocopherol (0.01 % w/w) exhibited minimal stabilizing effect, howeve resveratrol and vitamin C (0.01 % w/w) showed significant stabilizing effect. Increase in stability was proportional to the concentration of Vitamin C, but no concentration dependency with resveratrol was observed. Iontophoresis experiment was conducted using side-bi-side diffusion cell. Constant current was applied to the Ag/AgCl electrode. The concentration of NADPH in the receptor compartment was determined using HPLC. Flux increase was proportional to the concentration of NADPH in the donor solution ,and to the current density. Vitamin C decreased the flux.