vectors.
We synthesized a new conjugate of polyethyleniminet carrying galactose moieties as a targeting ligand for asialoglycoprotein (ASGP) receptors of hepatocytes.
Poly(ethylenimine) PEI (Mw=25kDa) was conjugated with lactobionic acid (LBA) using N,N'-dicyclohexylcarbodiimide and N-hydroxysuccinimide. The PEI-LBA conjugate was confirmed by FT-IR and 1H NMR spectroscopy. The capacity of DNA condensation of the LBA-PEI conjugate was observed by agarose gel electrophoresis with plasmid DNA. In vitro transfection experiments were carried out with beta-galactosidase reporter gene in HepG2 cells and HeLa cells. The transfection efficiencies in HeLa cells were entirely lower than those in HepG2 cells. The cytotoxicity of LBA-PEI conjugate was evaluated by MTT assay. The cell viability of the LBA-PEI conjugate was over 80% at all of the N/P ratios.
As a result, the LBA-PEI conjugate can be one of the gene carrier for the treatment of inherited and acquired disorders of liver.

[PE1-4] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Modulation of electroosmosis using penetration enhancers

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Electroosmotic flux during iontophoresis originates due to the net negative charge of the current passing channels (pores) in skin at physiological pH (pH 7.4). Thus, the channels are permselective to cations, and this causes the convective solvent flow from anode to cathodal direction. This solvent flow facilitates the flux of cations (from anode), inhibits that of anions (from cathode), and enables the enhanced transport of neutral, polar solutes. In this work, we have investigated the effect of chemical enhancer on electroosmosis to get more detail understanding of this phenomena. Using conventional in-vitro iontophoresis methodology, the change in electroosmotic flow was studied after enhancer treatment of skin. As a marker molecule for the direction and magnitude of electroosmotic flow, acetaminophen, a neutral molecule, was used. Four hydropilic and hydrophobic enhancers were studied. Without enhancer, anodal flux of acetaminophen was much higher than cathodal flux. Hydrophilic enhancer decreased the flux. This decrease in flux was proportional to the concentration of enhancer. On the other hand, hydrophobic enhancers enhanced the flux. Oleic acid showed the largest increase in flux. These results indicate that hydrophilic enhancer affect the current passing channels of the skin, and thus change the electroosmotic flow.

[PE1-5] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Glucocorticoids loaded beads for buccal ulcerative therapy

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Topical buccal therapy with steroid anti-inflammatory drugs is based on the concept that a high activity of steroids can be produced at the site of administration and, at the same time, the degree of systemic side effects can be minimized or avoided. In this study we developed a new formulation consisting of a mucoadhesive bead for buccal administration of glucocorticoids. Three types of beads were developed containing rose bengal, triamcinolone acetonide and betamethasone valerate. Moreover, the beads were coated with two other mucoadhesive

polymers; polyoxyethylenes (PEO), and polyacrylates (carbopol), each of those were produced changing the concentration of coating solutions (1, 3, 5, and 7%). In this work, we coated sugar core with drug loaded HPMC polymer and adhesive polymers in water-based fluidized bed coating method. Studies for the evaluation of release of the drug from the beads and bioadhesive force were carried out. Bioadhesion force was determined by using a texture analyzer. The beads had spherical shape and the surface of the beads was smooth. The size of the beads was about 500-800㎛. The beads are expected to be more useful for treatment of buccal ulcers than Aftach , because the beads can cover the ulcer site completely. It is apparent from the plots the drug release could be sustained almost approaching zero-order kinetic and was governed by the concentration of the mucoadhesive polymers. In all these cases, the rate of drug release was increased when the mucoadhesive polymers were coated at low concentrations, but was decreased when coated with at high concentrations. As for the beads coated with the hydrophilic adhesive polymers, the bioadhesiveness appeared to increase with a corresponding increase in the hydrophilic polymer content. After taking into consideration both drug-release and the bioadhesive properties, the beads coated with 7% PEO appeared to be the most suitable formulation for buccal ulcerative therapy.

[PE1-6] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Electroosmosis in skin during iontophoresis: effect of pH, current density and ionic strength

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At pH 7.4 (physiological pH), skin is permselective to cations, due to the net negative charge of the current passing channels (pores) in skin. This causes the convective solvent flow (electroosmotic flow) from anode to cathodal direction. In this work, we have investigated several factors (pH, current density and ionic strength) that can affect the electroosmotic flow. As a marker molecule for the direction and magnitude of electroosmotic flow, acetaminophen, a neutral molecule, was used. Experiments was performed using phosphate buffer and side-by-side diffusion cell. Constant current was applied to the Ag/AgCl electrode. The concentration of acetaminophen in the receptor compartment was determined by HPLC.Results showed that the direction of electroosmotic flow was reversed as the pH of the buffer solution was changed from pH 7.4 to 3.0. The magnitude of electroosmotic flow increased as the current density increased at pH 7.4. However, at pH 3.0, electroosmotic flow was higher at lower current density. Ionic strength also affected the electroosmotic flow. These results provide further mechanistic insights into the role of electroosmotic flow in transdermal flux of drugs.

[PE1-7] [04/18/2003 (Fri) 09:30 - 12:30 / Hall P]

Tyrosinase inhibitory effect of gentisic acid derivatives

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Gentisic acid, a skin-whitening agent, is known to possess tyrosinase inhibition activity. In order to develop an effective skin-whitening agent, hydroquinone derivatives in which the carboxylic acid moiety of gentisic acid was replaced with various functional groups, were selected and evaluated for their ability to inhibit tyrosinase activity as well as to inhibit melanin release.