The Preparation and Evaluation of Solid Lipid Nanoparticles(SLNs) containing 5 - Fluorouracil and its derivative

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Solid Lipid Nanoparticles(SLNs) are particulate systems for parenteral drug administration and have good biocompatibility,stability.SLNs were produced by homogenization process using hot dispersion technique of a melted lipid(lauric acid) dispersed in an aqueous surfactant solution at increased temperatue(85℃).SLNs were made from lipid(lauric acid) and nonionic surfactant such as polyoxyethylene sorbitan fatty acid esters (Tween20,80).We used several drugs(5-Fluorouracil,1-Benzoyl-5-Fluorouracil) to estimate the effect of partition coefficient to the loading efficiency and to study the release behavior.1-Benzoyl-5-Fluorouracil, the derivative of 5-Fluorouracil(the hydrophilic antitumor agent) was synthesized to show more lipophilic than 5-FU and characterized by 1H-NMR, Infrared(IR) and UV spectroscopy.We investigated the effect of surfactant-related (the kind of surfactant,concentration) changes, rpm of homogenization in the formation of SLNs and observed the drug contents, particle size using laser diffraction analysis,and release pattern performed by the dialysis test.

[PE1-9] [10/19/2000 (Thr) 15:00 - 16:00 / [Hall B]]

Tabletting of Drug-loaded Sugar Spheres and Release Behaviors

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Drug-loaded sugar spheres were tabletted using various types of diluents to investigate release behaviors of poorly water-soluble drug. Thereafter, the release was performed in simulated gastric fluid (pH 1.2) for 2h followed by intestinal fluid (pH 6.8) for 10h. The drug was at first loaded onto the nonpareil sugar spheres and then coated with drug-loaded polymeric suspension. The drug-loaded polymeric suspension contained drug, solubilizers and polymeric in a solvent of acetone and water (1:1 v/v). Hydroxypropylmethylcellulose (HPMC), Avicel, starch and lactose was selected as diluents for tabletting of the drug-loaded sugar spheres. The release behaviors and stability of matrix tablets were highly dependent on the types of diluents. Matrix tablets showed sustained release over 5h and then reached plateau levels. The starch, lactose and Avicel gave higher release rate compared with drug-loaded sugar spheres only. However, release rate was lower in case of HPMC matrix tablet. Cracking and physical unstability of the matrix tablet were observed during storage condition at 37oC/75% RH when lactose and starch were used for tabletting. However, HPMC and Avicel. From these finding, tabletting of drug-loaded sugar spheres was available. However, release rate and physical stability of matrix tablet was quite variable, depending on the types of diluents for tabletting.

[PE1-10] [10/19/2000 (Thr) 15:00 - 16:00 / [Hall B]]

Effects of lyophilization on the physical characteristics of sterically stabilized liposomes

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Sterically stabilized liposomes(SSL) have been introduced for longer circulation in blood than

conventional liposomes. However, there are couple of problems in SSL preparation due to the instability of phospholipid during storage and the degradation of drug in aqueous conditions. Lyophilization has been studied for conventional liposomes, but rarely studied for SSL. Therefore, in this study, effects of lyophilization on SSL were evaluated for physical characteristics changes upon redispersion of lyophilized SSL in the points of particle size, turbidity, drug entrapment, and drug release. SSL were prepared with DSPC and DSPE-PEG 2000. The size was controlled by polycarbonate extrusion to 100nm and sucrose was used as a cryoprotectant for lyophilization. The size change in rat plasma was observed by turbidity measurement to investigate the interaction of SSL and plasma protein. Even though there was a small increase in size after rehydration, encapsulation efficiency and turbidity were kept as its original state. In vitro drug release in plasma also revealed the similar results. Therefore, we can conclude that lyophilized SSL might be useful for the entrapment of labile drugs in aqueous environments.

[PE1-11] [10/19/2000 (Thr) 15:00 - 16:00 / [Hall B]]

Preparation and Evaluation of Aceclofenac Microemulsion for Transdermal Delivery System

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To develop novel formulation containing water-insoluble drug, aceclofenac, using microemulsion consisting of surfactant, oil phase, and water phase was prepared for increasing its skin permeability. Aceclofenac was very soluble in Triacetin and Labrafac hydro as oil phase, in Transcutol and Labrasol as surfactants. The microemulsion domain was wide when Triacetin or Labrafac hydro were used as oil phase and Labrasol as surfacfant. The mean diameters of microemulsion were about 90 nm and the system was very stable as the results centrifugal acceleration method. The pattern of dissolution ratios of each preparations were similar. And pH 6.8 buffer medium was suitable for the dissolution of aceclofenac. Skin permeation of aceclofenac from microemulsion preparations were increased then that of cream. These effects were important when linoleic acid or oleic acid was used as oil phase. Permeation rate (Js) of all types microemulsion were increased significantly than that of cream. The decreasing of the plasma ingredients of rat following muscle injury were more effective in the case of microemulsion than cream. The plasma ingredients following DOMS were decreased rapid in the treatment of microemulsion than that of cream.

[PE1-12] [10/19/2000 (Thr) 15:00 - 16:00 / [Hall B]]

Drug release from glycidyl methacrylate dextran nanoparticles

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Dextrans are colloidal, hydrophilic and water-soluble substances, inert in biological systems and do not affect cell viability. Dextrans can be degraded by the dextranase which was found to be present in the colon. Taking advantages of these enzymes, polymeric prodrugs for colonic drug delivery based on dextran were designed. Biodegradable nanoparticles were prepared from glycidyl methacrylate dextran (GMD) by coupling of glycidyl methacrylate to dextran in the presence of 4-(N,N-dimethylamino)pyridine (DMAP) using dimethylsulfoxide (DMSO) as an aprotic solvent. In this study, 5-aminosalicylic acid was conjugated with the GMD as a new colon-specific