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SUPREEYA LA-ONG : DEVELOPMENT OF PIG BRAIN LIPIDS FOR DRUG DELIVERY SYSTEM. THESIS ADVISORS : OPA VAJRAGUPTA, Ph.D., NUNTAVAN BUNYAPRAPHATSARA, Ph.D., VARAPORN JUNYAPRASERT, Ph.D. 197 P. ISBN 974-662-235-8

Lipids from pig brains were extracted and developed for use in a topical drug delivery system in this study. The main lipid components of the extract were cholesterol (CH) and cerebrosides (CS) in the amount of 1.53 % and 1.07 %, respectively. The CH:CS ratio of pig brain lipids was 1.44. Two topical drug-entrapped liposomes, clobetasol liposome and acyclovir liposome, together with their untrapped or blank liposomes were produced from pig brain lipids. High drug trap of 94 % in the production of clobetasol liposome was obtained while acyclovir liposome yielded lower drug trap (28 %). The differences in % drug trap resulted from the properties of the two drugs. Clobetasol 17-propionate was lipophilic so almost all of the added clobetasol resided in the lipid layer of the liposome membrane. On the contrary, acyclovir in the form of sodium salt was very soluble in water and resided in aqueous solution inside the liposome vesicle. More than half of the added acyclovir was not trapped in the liposome and was washed out by dialysis.

In vitro skin permeation tests of the two drug-entrapped liposomes in comparison with commercial drugs were carried out using pig skin and Franz diffusion apparatus. Drug content in pig skin and in receptor solution was assayed by HPLC. Drug delivery of clobetasol liposome reached the plateau faster than from Dermovate® solution with greater amount in skin ($p<0.01$). For acyclovir, although the drug content of the prepared liposome was only 30 % of Zovirax® cream, the permeated amount in both pig skin and in the receptor solution was greater ($p<0.01$). The results indicated that the CH-CS liposome enhanced drug delivery as reaching plateau faster and acted as drug targeting due to more drug deposit in the skin.

In vivo skin protection and treatment potential of untrapped or CH-CS liposome were evaluated. The CH-CS liposome showed skin protection effect against UVB irradiated skin up to 2 minimal erythema dose (MED) but had no effect in the treatment of UVB induced erythema. Preliminary *in vivo* efficacy of clobetasol liposome, its untrapped liposome or CH-CS liposome and Dermovate® solution in psoriasis treatment was investigated using psoriasis area severity index (PASI) scores and overall assessment scores. Similar improvement in scaling, erythema and thickening of the lesion was found.