CHAPTER I

INTRODUCTION

Although human skin is most suitable for *in vitro* percutaneous absorption studies, there are several problems involved in using the human skin, especially the ethic one. So there have been attempts to find other biological membranes for the *in vitro* permeation studies. These include the skins of pig, monkey, mice, rat, guinea pig, shed snake and rabbit. However, there is no perfect skin that can substitute for human skin. There have been many reports using pig skins for prediction of percutaneous absorption. Meyer et al. (1978) mentioned that a domestic pig seemed to be the only domestic animal having morphological and functional skin characteristics comparable to man. As far as the drug permeability is concerned, many studies have reported the likeness between human and pig skins (Hawkins, 1986; Bartex et al., 1972).

Human amnion is resembled to the single layer periderm of human embryo of 2-4 weeks (West et al., 1991). It can be used as a burn-wound covering in the treatment of pediatric burns (Thomson et al., 1998). Human placental membrane is adherent to the amnion and permits exchange of nutrient and oxygen. Jittida (1994) found a relatively high correlation between the steady state fluxes of piroxicam, phenylbutazone, indomethacin, diclofenac diethylammonium and diclofenac sodium through human amnion and newborn pig skin. The steady state fluxes of the five NSAIDS through human placental membrane were also correlated to those through pig

skin. Among the five NSAIDS studied, diclofenac sodium yielded the highest flux. Therefore, the three membranes are studied further about the permeability enhancement of diclofenac sodium by some enhancers. The enhancers studied include tween 20, brij 35, propylene glycol, tetraglycol, ethanol, isopropanol and orange oil using water as a control.

Objective

To study the effect of various enhancers on diclofenac sodium flux through human placental membrane, human amnion and newborn pig skin.