FORMULATION AND EVALUATION OF TOPICAL CALCINEURIN INHIBITOR LOADED TRANSFERSOMAL DRUG DELIVERY FOR VITILIGO

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AThesis Submitted to
Gujarat Technological University in Partial Fulfillment of the Requirements for
The Degree of Pharmacy in Pharmaceutics

APRIL – 2016

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Abstract:

The aim of the present investigation was to formulate and evaluate topical calcineurin inhibitor loaded transfersomal drug delivery for vitiligo using rota evaporator followed by thin film method. Tacrolimus can restore the melanocytes if given in transfersomal gel. Fourier transform infrared spectroscopy (FTIR) had employed to study drug-excipients incompatibility. Analytical method was performed using UV spectrophotometer. Topical calcineurin inhibitor loaded transfersomal gel was evaluated for particle size, zeta potential, percent drug entrapment, surface morphology, *in-vitro* drug release study, in vitro permeability study and stability study. Optimization of process parameter was done by 3^2 full factorial Design Expert software. FTIR study shows that neither drug decomposition nor drug-excipients and excipient-excipient interactions occurred in the formulation. Regression co-efficient for the drug in acetonitrile were found to be 0.997 of each and the linearity range of tacrolimus in acetonitrile was found to be 6-18 µg/ml. Topical calcineurin inhibitor was successfully prepared with drug:lipid(1:10), lipid:surfactant(9:1), water as hydration medium, chloroform:methanol(9:1) as solvent, HPMCK100 as mucoadhesive agent and extract of catechu powder to provide colour on skin. Optimization study of process parameter shows that batch prepared with hydration time 55 min,evaporation time 15 min, hydration temperature is 50°C and temperature to form thin film is 60°C as optimum condition for rota evaporator. Particle size, zeta

potential, percent drug entrapment were found to be 155.5 nm, -49 mV, 80% respectively for optimized batch.

Key words- Vitiligo, Tacrolimus, Transfersomal gel, Thin film hydration method, Vesicle size, PDE, Zeta-potential, Skin irritation study, Skin sustain study, Stability study