Dermatophyte is a type of fungus which infect top layer of the skin, nails and hairs. The mainstay of management of fungal infectivity and dermatophytes associated with skin and nail injuries has been oral and topical antifungal drug delivery systems.

Polyene antifungal like Nystatin was found to be effective against many fungal infection as well as molds infection. Furthermore fungal infection is associated with inflammation hence combined therapy of antifungal and anti-inflammatory such as Triamcinolone acetonide is prescribed for the effective treatment. As per BCS classification it is Class-IV drug which has low permeability and low solubility. Due to its toxicity profile it cannot be formulated into injectable formulations.

Niosome carrier released the active pharmaceutical ingredient in sustainable manner and develops niosomal delivery system for fungal infection. Afterwards niogel was developed for improvement of topical applicability of niosomal dispersion to localize API at target site of action.

Preformulation study gives profiles of drugs and other ingredients added in the formulation development. The standardization of drugs and excipients is an integral part of research work. The drug and excipients were standardized and found to comply with pharmacopeial specifications. Hence they were used for further development of formulations.

In formulation development of niosomal dispersion, initially blank niosomal formulation was prepared by using various concentrations of Span 60 & cholesterol. The batches were optimized for various processing and formulation parameters.

Optimization of niosomal dispersion is one of the critical process that need consideration of number of factors and ingredients interaction in formulation development. We have adopted a $3^2$ factorial design approach. Quantity of span-60 and cholesterol were preferred as two independent variables and different performance indicators were studied to establish the outcome of concentration of lipid phase on niosome performance. The different parameters studied were vesicle size, size distribution, zeta potential, encapsulation efficiency and in-vitro drug release from the obtained data. Niosomal dispersion showed sustained released than
conventional dispersion. It was confirmed by *ex-vivo* study by using porcine skin. Thus stable niosomal dispersion of nystatin and triamcinolone acetonide was developed.

In formulation development and evaluation of niogel initially gels were subjected to Rheological study. Rheological mark of 2% carbopol gel was better when compared to other gel (1%, 1.5% w/w) and hence, was considered for further studies. It was concludes that niosomal gel showed slow release of drug than Conventional Gel. In-*vitro* drug deposition study on excised porcine skin for 48 hrs showed that the Niosomal gel shows more drug deposition than Conventional gel.

Skin irritation study reveals that developed niosomal gel having primary irritation index is zero. Threfore, formulation was found to be safe and non irritant to the skin.

From Antifunagal activity study it can be concluded that, zone of inhibition obtained by niosomal dispersion was higher as compared to Niogel. From these results, it can be interpreted that the drug release was retarded in the gel matrix of niogel. The results obtained using conventional formulations were same as that of niosomal formulation. The blank formulation was not showing any zone of inhibition indicating that the solvent used in sample preparation did not interfere in antifungal activity. Thus, developed formulation showed good antifungal activity against *Candida albicans* 36082.

Stability study summarize that Niosomal dispersion and Niogel were more stable at 4-8°C than 25°C ± 2°C, 60% RH ± 5%.

So, it can be concluded that safe, efficacious, non irritant surfactant based topical formulation was successfully developed for treatment of fungal disease.