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Ex vivo and *in vivo* evaluation of Impossible tochopherol and tocopherol acetate formulations

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The objectives of this study were: a) preparation of the of tocopherol (T) and tocopherol acetate (TA) in different local formulations, self-emulsified drug delivery systems (SEDDS), gel and monophasic liquid systems; b) evaluation of ex vivo and *in vivo* transdermal permeation of T/TA from the promising formulations. Analysis of T/TA was performed by a validated HPLC method using UV detector. The relevant physicochemical properties of the tested formulations were assessed. The ex vivo, performed in vertical Franz diffusion cells, and *in vivo* permeation through neonatal rat skin was evaluated. Design of Experiment (DOE) was carried out to optimize the formulation factors. The permeation of T from SEDDS, gel and emulsion formulations was very poor (0.001-0.013%). The results of DEO indicated a good agreement between actual and predicted values. The highest permeation (0.07%) was observed from monophasic liquid formulations, with the highest (5%) dimethyl sulfuxide (DMSO), medium (0.5%) tocopheryl polyethylene glycols (TPGs), and lower (0.5%) T concentration. The in vivo results demonstrated higher retention properties of the stratum corneum layer, compared to the subcutaneous tissues; 1377 and 1.13 μg/g , respectively. Increasing T concentration from 4.8 to 9.5% did not increase the amount permeated and %-retained of T. The %-retained values were close to each other for both T concentrations (4.8 and 9.5%); 16.33 and 17.34%, respectively. Simple solutions of T in presence of DMSO and TPGs are more promising systems; compared to, SEDDS, gel, emulsion or oleaginous systems.

Biography

Aly Nada attained his PhD from University of Tuebingen, Germany. He served as academic member in different countries, including Egypt, Saudi Arabia, United Emirates and currently as The Chairman of Pharmaceutics, Kuwait University. The main research interests are formulation of small molecules in the form of oral solids and topical delivery of drugs. He served as reviewer for many reputable Journals, e.g. European Journal of Pharmaceutics and Biopharmaceutics, Drug Development and Industrial Pharmacy, etc. Dr. Nada is a member of The American Association of Pharmaceutical Scientists (AAPS) and serves as reviewer of abstracts submitted to The Annual Meetings.

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