Bhupendra Prajapati, Pharmaceut Anal Acta 2014, 5:3
http://dx.doi.org/10.4172/2153-2435.S1.022

OMICS Group Conferences
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4th International Conference and Exhibition on
Pharmaceutics & Novel Drug Delivery Systems
March 24-26, 2014 Hilton San Antonio Airport, San Antonio, USA

Bioavailability enhancement study of BCS class IV drug: Snedds approach

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The purpose of present study is to formulate SNEDDS of BCS Class-IV (Exemestane HCl) to investigate its potential oral drug delivery system by improving its bioavailability. Preformulation study was done for selection of oils, surfactants & co-surfactants. Based on the solubility studies, Caprol microexpress and Labrafac as oil phase, Tween 80 as a surfactant and Triacetin as a co-surfactant were selected. Phase studies were performed using different ratio like (1:1, 1:2, 1:3, 2:1, 3:1) [oil: (surfactant/co-surfactant)]. Pseudo ternary phase diagram were prepared, Tween 80: triacetin (1:2) and (1:3) ratio showed the highest area for the preparation for the nanoemulsion. All formulations were evaluated for the visual assessment, optical clarity, particle size, drug content, viscosity, *in vitro* release study. From *vitro* characterization results, three formulations were selected as potential formulation for *in vitro* cytotoxicity screening and *in vivo* pharmacokinetic study. EX1 showed particle size (29.56 nm), Polydispersity index (0.523), Zeta potential (-40.3), & drug release after 120 min. was 99.589±1.85 % EX2 showed particle size (37.65 nm), Polydispersity index (0.835), Zeta potential (-30.3), & drug release after 120 min was 99.17±1.81 % EX3 showed particle size (44.73 nm), Polydispersity index (0.679), Zeta potential (-15.7), & drug release after 120 min was 98.172±1.29 % due to its low particle size and excellent stability. The dose response curves demonstrated that Exemestane SNEDDS had less cytotoxicity compared to the drug solution alone after 24 hrs but EX2 showed greater % cell inhibition as well as greater AUC Compare to EX3 and EX1. It can be concluded that SNEDDS is a novel and commercially feasible approach to improve oral bioavailability of BCS class-IV drug like exemestane HCL.

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