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Enhancement of solubility and bioavailability of linagliptin solid dispersions by solvent evaporation technique with novel carriers

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Ensuring sufficient drug solubility is a crucial problem in pharmaceutical related research. For water-insoluble drugs, various formulation approaches are employed to enhance the solubility and dissolution rate of lead compounds. The goal of this study was to prepare and characterize solid dispersions of the poorly water soluble antidiabetic agent Linagliptin with novel water soluble carriers such as Kolliphor P 407, Kolliphor P 188, Kolliwax GMS II, Kolliphor HS15 and Soluplus in proportions viz. 1:1 & 1:3 (Drug: Carrier) with SLS as surfactant (0 to 2%) to improving its aqueous solubility and rate of dissolution by solvent evaporation technique. All the formulations showed marked improvement in the solubility behavior and improved drug release. From all the formulations SD15 was found to be optimized formulation using Kolliwax GMS II as carrier based on the solubility and dissolution studies. Analysis of X-ray diffraction of SD15 showed that Linagliptin existed in the amorphous form within the solid dispersion formulation fabricated using the solvent evaporation process. Scanning electron microscopy studies suggested the conversion of crystalline Linagliptin to an amorphous form. The dissolution rate of the Linagliptin solid dispersion was greatly enhanced relative to the pure drug. The results obtained showed that the aqueous solubility and rate of dissolution was significantly improved when formulated in solid dispersion as compare to pure drug.

Biography

D V R N Bhikshapathi has completed his PhD from Kakatiya University in Pharmaceutical Sciences, Warangal. He is working as Professor and Head, Dept of Pharmaceutics with 18 years of teaching and research experience in Novel Drug Delivery System. He has published more than 50 papers in reputed journals and has 2 Indian Patents.

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