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REVIEW ARTICLE

SOLID DISPERSIONS: AN INDUSTRIALLY FEASIBLE ALTERNATIVE APPROACH TO FORMULATE BRICK DUST MOLECULES

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The enhancement of oral bioavailability of poorly water-soluble drugs remains one of the most challenging aspects of drug development. The solid dispersions have attracted considerable interest as an efficient means of improving the dissolution rate and thereby the bioavailability of poorly soluble therapeutic substances which were otherwise to be formulated through nanomiling or prodrug formation. This review compiles historical background, definitions, rationale and scope, formulation aspects and carriers used, preparation methods, drug release mechanisms, characterization and advantages of solid dispersion system along with its limitations as well as alternative approaches to overcome these limitations which are responsible for its little commercialization.

Key words: Solubility enhancement, Drug delivery, Dissolution, Bioavailability.

INTRODUCTION

The drug substances are rarely administered in its pure chemical form, rather a suitable dosage form needs to be formulated which carry and deliver the drug to proper site of absorption at an optimum rate. The dosage forms so formulated may be administered through topical, oral or parenteral route. The oral route is most important for administering drugs for systemic effects. When a new drug is discovered, one of the first questions, a pharmaceutical company asks is whether or not the drug can be effectively administered by the oral route, for its intended effect. From a patient's perspective, swallowing a dosage form is comfortable and familiar means of taking medication. As a result, patient compliance and hence drug treatment is typically more effective with orally administered medications as compared to the non-conventional routes of administration (Dhirendra *et al* 2009). The development of oral dosage forms especially for poorly water soluble drugs has been a challenge to formulation scientists because of many self-dependant variables in the absorption of drug from gastrointestinal tract. The formulation scientist must have to take an account of relationship between drug release from product and absorption process. In this respect, the rate-limiting step is of primary relevance. The bioavailability and therefore *in vivo* performance of the drug will be dependent on the solubility parameter, if dissolution / drug release is the rate limiting step for dosage form. In contrast, as long as the permeation through bio-membranes is rate-limiting process, bioavailability and bioequivalence are not so much dependent upon the drug release behavior of the dosage form. A drug must possess some aqueous solubility and