OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Bioavailability and Bioequivalence:
Pharmaceutical R&D Summit
May 20-22, 2013 DoubleTree by Hilton, Beijing, China

Lipid based nanoparticles for improved oral bioavailability of pharmaceuticals

Deepti Pandita
Nanomedicine Centre, JCDM College of Pharmacy, India

Solubility remains an essential characteristic of active pharmaceutical ingredients (APIs), with profound effects on processes and clinical development, formulation, and commercialization. Industrial estimates though varied over the years, but at least 40% and as many as 70% of New Chemical Entities (NCEs) are considered poorly soluble in water, leading to low bioavailability, high intra and inter-patient response variability, and variable dose proportionality. As solubility and permeability are considered prerequisites to oral absorption, poorly water soluble drugs exhibit low bioavailability and creative formulation efforts are required to develop delivery systems that have acceptable pharmacokinetics.

Lipid based nanoparticle formulations are currently being investigated to improve oral absorption by a number of ancillary mechanisms, including gastro-intestinal (GI) solubilization of poorly soluble drugs, stability in GI fluids, inhibition of P-glycoprotein-mediated drug efflux and preabsorptive metabolism and promotion of lymphatic transport, which delivers drug directly to systemic circulation while avoiding hepatic first-pass metabolism, and by increasing GI membrane permeability. Lipid nanoparticles compared with other nano or micro-particulate carriers, combine the advantages of liposomes, emulsions, and polymeric nanoparticles for drug delivery, but avoid their drawbacks. Lipid based systems like solid lipid nanoparticles, nanostructured lipid carriers and lipid conjugates show good biocompatibility, controlled drug release, protection of incorporated active compounds against chemical degradation, a high bioavailability by oral administration and the possibility of production on industrial scale. Lipid based suspensions, solutions and emulsions, and more recently, self emulsifying lipid based formulations are also being investigated for oral applications.

Lipid carriers have bright future due to their inherent property to enhance the bioavailability of lipophilic drugs, however, the limitations of these carriers like poor physic-chemical properties of lipids, lack of drug solubility database in lipids and unavailability of standard methodologies for *in vitro* analysis needs to be addressed. Continued exploration and application of these delivery systems will better define instances in which these potential issues may surface which in turn, should foster development of effective strategies for addressing them.

Biography

Deepti Pandita is working as Head, Dept. of Pharmaceutics, JCDM College of Pharmacy, affiliated to Pt. B. D. Sharma University of Health Sciences, India. She obtained her Ph.D. from Jamia Hamdard, Hamdard University (India) and did postdoctoral studies from Centro de Química da Madeira, University of Madeira (Portugal). She achieved her post graduation from Manipal Academy of Higher Education, Karnataka. She has two Indian Patents and has published more than 15 papers in reputed journals like Journal of Controlled Release, Molecular Pharmaceutics, Biomacromolecules, Nanotoxicology etc. Her present areas of research include nanoparticulate systems for oral drug bioavailability enhancement especially for anti-cancer agents and also brain targeting applications. She is the reviewer of several peer reviewed journals like Nanomedicine, International Journal of Pharmaceutics, Molecular Pharmaceutics, Journal of Microencapsulation etc.

deeptipandita@yahoo.co.uk