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Application of nano-emulsion in drug delivery of poorly water-soluble drugs

Poor water solubility of more than 60-80% of new chemical entity present a major hurdle in the design of parenteral drug delivery systems with sufficient drug loading in the market dosage form. Administration of those compounds by parenteral route without causing injection site reaction and systemic toxicity effects constitutes another barrier. Current solubilization and parenteral delivery technologies for water insoluble drug are summarized. The key considerations in design of stable parenteral drug delivery system, such as drug physic-chemical and biopharmaceutical properties, selection and evaluation of solubilization and delivery technology, and excipients are presented. EmulSol is a technology for production of oil-in-water nano-emulsions. Nano-emulsions are meta-stable, and a high level of input energy is required to produce a nano-emulsion. Case studies in application of EmulSol nano-emulsion in development of the following new formulations by NDA 505 (b) 2 are presented. Injectable version of Plavix (Clopidogrel) tablet for quick onset in antiplatelet function, which addresses issues in delay in drug onset, low solubility, instability, and injection site irritations are given. Plavix is a leading anti-thrombotic medicine that is used to treat Acute Coronary Syndrome. Clear cyclosporine nano-emulsion eye-drop for dry eyes, an enhanced version of Restasis Eye Drop for improvement in drug efficacy and side effects in burning sensation and blurry vision are also presented.

Biography

Jim Jingjun Huang founded Ascendia in 2012 after fifteen years of pharmaceutical R&D experience at Pfizer, Baxter, AstraZeneca, and Roche. He has led the formulation development efforts for the successful transition of several oral and parenteral dosage forms from discovery through formulation, manufacturing, technical transfer and ultimately commercialization. He holds a PhD in Pharmaceutics from the University of the Sciences in Philadelphia (formerly Philadelphia College of Pharmacy and Sciences) where he worked with Joseph B Schwartz.

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