



S.A.S. NAGAR

राष्ट्रीय औषधीय शिक्षा एवं अनुसंधान संस्थान

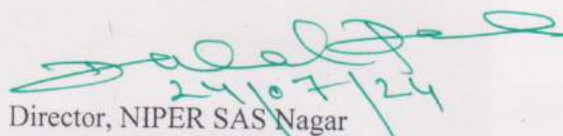
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Summary on the Outstanding Research Work on Which Fellowship is Claimed

The requirements for drug formulations have increased significantly in recent decades, while at the same time the market situation has grown increasingly challenging. Several API launched in the market lie in difficult-to-formulate category, which involve API with : 1) high crystalline energy 2) pH dependent solubility and 3) brick dust characteristics. There is no one-size-fits all approach that can be applied to all APIs and formulations; the best solution depends on the API characteristics and the intended formulation type and performance.

Prof Abhay applied physiology based biopharmaceutical modelling (PBPK) for suitable formulation design in order to achieve bioequivalence with a Reference Listed Drug (RLD) for **rapid generic product development**. Parameter sensitivity analysis of API helps in design of API-friendly formulations. He has developed advanced lipid formulations (LBF) suitable for brick dust API which include: 1) **supersaturated LBF** to boost drug loading and simultaneously reduce the pill burden 2) **lipophilic salts** or complexes for enhancing lipid solubility of API. Prof Abhay is instrumental in development of ternary amorphous solid dispersion for stabilisation of highly crystalline API. Polymers are screened over supersaturated precipitation assays. He has developed **amorphous salt solid dispersion**, an extension to the existing amorphous solid dispersion technology to cater the best suitable formulation of pH-dependent soluble drugs in intraluminal environment.


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