Multi particulate systems as solubilising and stability enhancing agents

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Background

One of the major problems associated with the introduction of high throughput screening in the drug discovery process is the generation of lead candidates that suffer from poor solubility and bioavailability. Similarly there are a wide range of drug molecules currently on market that are only formulated as oral solid dosage forms. The project aims to investigate the development of mono/multi particulate delivery systems which would support flexible dosing platform and a variety of release profile mechanisms for drugs that have inadequate water solubility and are only available as solid dosage forms. Multi particulate delivery system enables the fabrication of delivery vehicles that would not only enhance the aqueous solubility but also provide improved physical and chemical stability. These systems will be synthesised from a range of generally recognised as safe polymers (GRAS), surfactants and block polymers.

Methodology

The work involves the development and optimisation of formulations for model drug candidates. Various analytical techniques such as high pressure liquid chromatography, differential scanning calorimetry, freeze drying, infra red spectroscopy, scanning electron microscopy and photon correlation spectroscopy will be used to study interactions between drug molecules and delivery system. Initial studies will involve screening delivery systems to suit the drug characteristics. These studies will be followed by stability testing and thorough characterisation of the formulations.

Anticipated outcomes

The project would result in the development of mono/multi particulate delivery system ideal to overcome physical and chemical instability of drug candidates.

The results will give an insight into the mechanisms governing the suitability of a delivery system for specific drug moieties.