aspects of product development that are specifically associated with the formulation of commercial coamorphous systems as solid oral dosage forms. These include coformer selection; screening; methods of preparation; preformulation; physical stability; bioavailability; and final formulation. Through such an analysis of coamorphous API-small molecule coformer systems, against the more widely studied API-polymer dispersions and cocrystals, it is believed that the strengths and weaknesses of coamorphous systems can be better understood, leading to more efficient formulation and manufacture of such systems for enhancing oral bioavailability.

Parikh, A. et al. (2016). "Development of a novel oral delivery system of edaravone for enhancing bioavailability." *Int J Pharm* 515(1–2):490–500.

Edaravone (EDR), a strong free radical scavenger, is known for its promising therapeutic potential in oxidative stress (OS) associated diseases, however poor oral bioavailability is the major obstacle in its potential use. Oral liquid dosage form is the most preferred delivery method in pediatric, geriatric and specialized therapies. The present research discusses the development of a Novel Oral Delivery System (NODS) of EDR to enhance oral bioavailability. From preformulation study, solubility, and stability were identified as key challenges and the requirement of an acidic environment and protection against oxidation were found to be critical. The NODS made up of a mixture of Labrasol (LBS) and an acidic aqueous system, was optimized on the basis of solubility and stability study. It can be stored ≤40°C for at least one month. Drug release from NODS was slow, sustained and significantly better as compared to suspension. The significant reduction in metabolism and improvement in permeability across the small intestine were observed with NODS compared to free EDR. The oral pharmacokinetic study showed 571% relative bioavailability with NODS compared to EDR suspension. From the results obtained, NODS is a promising candidate for use in OS associated diseases.

Park, M. H. et al. (2015). "Preformulation studies of bee venom for the preparation of bee nenom-loaded PLGA particles." *Molecules* 20(8):15072–15083.

It is known that allergic people were potentially vulnerable to bee venom (BV), which can induce an anaphylactic shock, eventually leading to death. Up until recently, this kind of allergy was treated only by venom immunotherapy (VIT) and its efficacy has been recognized worldwide. This treatment is practiced by subcutaneous injections that gradually increase the doses of the allergen. This is inconvenient for patients due to frequent injections. Poly(D, L-lactide-co-glycolide) (PLGA) has been broadly studied as a carrier for drug delivery systems (DDS) of proteins and peptides. PLGA particles usually induce a sustained release. In this study, the physicochemical properties of BV were examined prior to the preparation of BV-loaded PLGA nanoparticles NPs). The content of melittin, the main component of BV, was 53.3%. When protected from the light, BV was stable at 4°C in distilled water, during 8 weeks. BV-loaded PLGA particles were prepared using dichloromethane as the most suitable organic solvent and two min of ultrasonic emulsification time. This study has characterized the physicochemical properties of BV for the preparation BV-loaded PLGA NPs in order to design and optimize a suitable sustained release system in the future.

Qi, W. et al. (2014). "Preformulation study of highly purified inactivated polio vaccine, serotype 3." *J Pharm Sci* 103(1):140–151.