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Cocrystals of Etodolac: A Crystal Engineering Approach with an Endeavor to Enhance Its Biopharmaceutical Assets

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Abstract : Cocrystallization comprises a selective route to the intensive design of pharmaceutical products with desired physiochemical and pharmacokinetic properties. The present study is focused on the preparation, characterization, and evaluation of etodolac (ET) co-crystals with coformers nicotinamide (ETNI) and Glutaric acid (ETGA), using cocrystallization approach. Preliminarily examination of the prepared co-crystal was done by differential scanning calorimetry (DSC), Fourier transform infrared spectroscopy (FT-IR), powder X-ray diffraction (PXRD). DSC thermographs of ETNI and ETGA cocrystals showed single sharp melting endotherms at 144°C and 135°C, respectively, which were different from the melting of drugs and coformers. FT-IR study points towards carbonyl-acid interaction sandwiched between the involving molecules. The emergence of new peaks in the PXRD pattern confirms the formation of new crystalline solid forms. Both the cocrystals exhibited better apparent solubility, and 3.8-5.0 folds increase in IDR were established, as compared to pure etodolac. Evaluations of these solid forms were done using anti-osteoarthritic activities. All the results indicate that etodolac cocrystals possess better anti-osteoarthritic efficacy than free drug. Thus loom of cocrystallization has been found to be a viable approach to resolve the solubility and bioavailability issues that circumvent the use of potential antiosteoarthritic molecules.

Keywords : bioavailability, etodolac, nicotinamide, osteoarthritis
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