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Title:	Novel Pharmaceutical Cocrystals of Gefitinib: A Credible Upswing in Strategic Research to Ameliorate Its Biopharmaceutical Challenges
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Abstract:	There is a paradigm shift in the preformulation drug development strategy of the pharmaceutical industry to engineer the desired dosage form by solid-state manipulation. Cocrystallization is one approach that has been applied in the present study to fortify the poor biopharmaceutical attributes of one of the leading orally effective anticancer drugs in chemotherapy, Gefitinib (GEF). Two novel pharmaceutical cocrystals were engineered with Generally Regarded as Safe (GRAS) status coformers isonicotinamide (INCT) and vanillin (VAN). These novel cocrystals were characterized by differential scanning calorimetry (DSC), powder X-ray diffraction (PXRD), fourier transform infrared (FTIR) spectrometry, hot stage microscopy (HSM), field emission scanning electron microscopy (FESEM), and single-crystal X-ray diffraction (SXRD). Crystal structure analysis showed that GEF–VAN had cocrystallized in a 2:1 ratio, whereas in the case of the cocrystal hydrate of Gefitinib with isonicotinamide (GEF–INCT) the asymmetric unit showed a stoichiometric ratio of drug/coformer/water of 1:1:2. Both cocrystals showed improvement in intrinsic dissolution, maximal serum concentration, and cell inhibition response as compared to a drug, with GEF–INCT·2H2O showing better results than GEF–VAN. Such an improvement of biopharmaceutical properties with good stability via these new solid forms of GEF produced by cocrystallization strengthens the claim of novel drug formulation.
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