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Improving the bioavailability of quercetin: A crystal engineering approach

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Over the past few years, there has been growing interest in the design of nutraceutical cocrystals, which emerges as a potential method for enhancing the bioavailability of some poorly soluble natural compound. Quercetin, a flavanone aglycone and a well known nutraceutical suffers from poor solubility in water and a resultant poor oral bioavailability. The present study covers the preparation of cocrystal of quercetin with picolinic acid as coformer, a biomolecule having appreciable water solubility and GRAS status, prepared by solvent drop grinding method utilizing ethanol as solvent. The characterization and evaluation was also done. The DSC scan of cocrystal shows the appearance of a single endothermic transition at 228.66°C which is different from the melting peaks of both quercetin (321.32°C) and picolinic acid (138.316°C) indicating the formation of a new stable phase. The Powder-X-Ray diffraction studies have shown newer peaks in the spectrum of the cocrystal at 19.1 and 27.4 ° 2θ differentiating it from the drug and the coformer. Comparison of FT-IR spectrum of cocrystal with that of pure components shows new peaks at 2917, 3034 cm⁻¹ along with shift of peaks from 1561.0 cm⁻¹ in quercetin spectrum and from 1526.13 cm⁻¹ in picolinic acid spectrum to 1558.97 and 1522 cm⁻¹ respectively in the cocrystal spectrum. The solubility studies carried out in distilled water and buffer of pH 7 showed improved solubility of cocrystal as compared to drug which is expected to have enhanced oral bioavailability.

Biography

Kunal Chadha is a PhD student and researcher at Panjab University, India

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