SUMMARY

[00029] In one aspect, provided herein is a coformer salt of (2*S*,3*S*)-methyl 7-fluoro-2-(4-fluorophenyl)-3-(1-methyl-1*H*-1,2,4-triazol-5-yl)-4-oxo-1,2,3,4-tetrahydroquinoline-5-carboxylate optionally as a solvate and additionally optionally as a hydrate thereof.

[00030] In certain embodiments, the coformer salt is in a substantially pure crystalline form.

[00031] In certain embodiments, the coformer salt is a [(1S)-endo]-(+)-3-bromo-10-camphor sulfonic acid salt of (2S,3S)-methyl 7-fluoro-2-(4-fluorophenyl)-3-(1-methyl-1H-1,2,4-triazol-5-yl)-4-oxo-1,2,3,4-tetrahydroquinoline-5-carboxylate.

[00032] In certain embodiments, the coformer acid is [(1*S*)-*endo*]-(+)-3-bromo-10-camphor sulfonate.

[00033] In certain embodiments, the coformer salt is a crystalline form exhibiting at least one of a solid state ^{13}C NMR spectrum with peaks at 210.3, 25.3, 21.8, 20.8, 19.5, and 18.5 ppm ± 0.2 ppm; a differential scanning calorimetry thermogram having a broad endotherm between 25 °C and 90 °C and an endotherm with a maximum between about 135 °C and 147 °C; a thermogravimetric analysis thermogram indicative of a solvated material; or a X-ray powder diffraction pattern comprising peaks at 2θ angle degrees ± 0.2 2θ angle degrees of 6.7, 9.7, 18.5, 19.5, and 22.

[00034] In some embodiments, the coformer salt is in a crystalline form exhibiting at least one of a solid state ^{13}C NMR spectrum with peaks at 210.3, 25.3, 21.8, 20.8, 19.5, and 18.5 ppm ± 0.2 ppm; or a X-ray powder diffraction pattern comprising peaks at 2θ angle degrees ± 0.2 2θ angle degrees of 6.7, 9.7, 18.5, 19.5, and 22.

[00035] In some embodiments, the coformer salt is a (*S*)-1-phenylethanesulfonic acid salt of (2*S*,3*S*)-methyl 7-fluoro-2-(4-fluorophenyl)-3-(1-methyl-1*H*-1,2,4-triazol-5-yl)-4-oxo-1,2,3,4-tetrahydroquinoline-5-carboxylate.

[00036] In some embodiments, the coformer acid is (1*S*)-phenylethanesulfonate.

[00036a] In another aspect provided herein is a method of preparing a coformer salt of (2*S*,3*S*)-methyl 7-fluoro-2-(4-fluorophenyl)-3-(1-methyl-1*H*-1,2,4-triazol-5-yl)-4-oxo-1,2,3,4-tetrahydroquinoline-5-carboxylate comprising:

(1) treating methyl 7-fluoro-2-(4-fluorophenyl)-3-(1-methyl-1*H*-1,2,4-triazol-5-yl)-4-oxo-1,2,3,4-tetrahydroquinoline-5-carboxylate with a coformer in one or more step 1a) solvent(s) at an elevated temperature to form a step 1a) solution;

wherein the step 1a) solvent(s) are selected from C_{1-6} ketone, C_{1-6} alcohol, ethyl acetate, tetrahydrofuran, toluene, acetonitrile, heptane, dioxane, and water;

(2) allowing the step 1a) solution to stand under conditions sufficient to precipitate the coformer salt in a solid form; and

(3) isolating the coformer salt solid form.

[00037] Also provided herein is a method of preparing a coformer salt of (2*S*,3*S*)-methyl 7-fluoro-2-(4-fluorophenyl)-3-(1-methyl-1*H*-1,2,4-triazol-5-yl)-4-oxo-1,2,3,4-tetrahydroquinoline-5-carboxylate comprising (1) treating methyl 7-fluoro-2-(4-fluorophenyl)-3-(1-methyl-1*H*-1,2,4-triazol-5-yl)-4-oxo-1,2,3,4-tetrahydroquinoline-5-carboxylate with a coformer in one or more step 1a) solvent(s) selected from MIBK, MEK, ethanol, and water at an elevated temperature to form a step 1a) solution; (2) allowing the