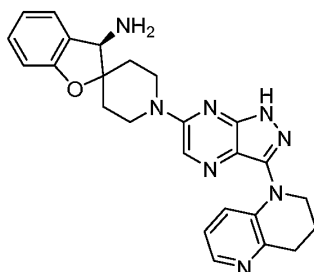


CLAIMS

What is claimed:

1. A solid form of Compound I-1:



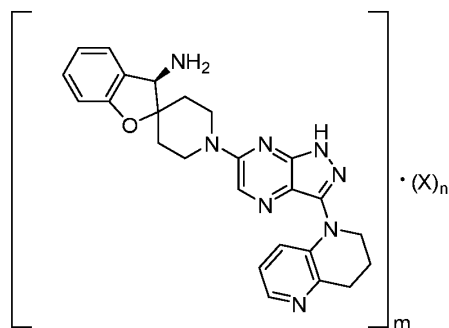
5

I-1,

or a solvate thereof.

2. The solid form of claim 1, wherein the solid form is amorphous.
3. The solid form of claim 1, wherein the solid form is crystalline.
4. The solid form of claim 3, characterized by a powder X-ray diffraction pattern having at
 10 least two characteristic peaks, in degrees 2θ , each selected from the group consisting of about 24.6, about 19.9, and about 16.0 2θ .
5. The solid form of claim 3, characterized by a powder X-ray diffraction pattern with at least two characteristic peaks, in degrees 2θ , each selected from the group consisting of about 24.6 2θ , about 19.9 2θ , about 16.0 2θ , about 6.7 2θ , about 12.8 2θ , about 13.4 2θ and about
 15 20.7 2θ .
6. The solid form of claim 3, wherein the solid form is characterized by an XRPD pattern substantially similar to that depicted in FIG. 1A, or characterized by a X-ray powder diffraction pattern having peaks, in degrees 2θ , at about 24.6, about 19.9, about 16.0, about 6.7, about 12.8, about 13.4 and about 20.7.
- 20 7. The solid form of any one of claims 3-6, characterized by a differential scanning calorimetry (DSC) profile showing an endotherm with an onset of about 196 $^{\circ}\text{C}$, a peak of about 197 $^{\circ}\text{C}$.

8. A compound of Formula (I)



(I),

or a solvate thereof;

5 wherein,

m is 1-9;

n is 1-3; and

X is selected from a group consisting of hydrochloric acid, hydrobromic acid, sulfuric
 acid, methane sulfonic acid, phosphoric acid, *p*-toluene sulfonic acid, benzene
 10 sulfonic acid, oxalic acid, L-aspartic acid, maleic acid, malonic acid, L-tartaric
 acid, fumaric acid, citric acid, succinic acid, and glutaric acid.

9. The compound of claim 8, wherein the compound is selected from the group consisting of
 Compound I-2, Compound I-3, Compound I-4, Compound I-5, Compound I-6, Compound I-
 7, Compound I-8, Compound I-9, Compound I-10, Compound I-11, Compound I-12,
 15 Compound I-13, Compound I-14, Compound I-15, Compound I-16, and Compound I-17.

10. The compound of claim 8 or 9, wherein the compound is in solid form.

11. The compound of claim 8 or 9, wherein the compound is amorphous.

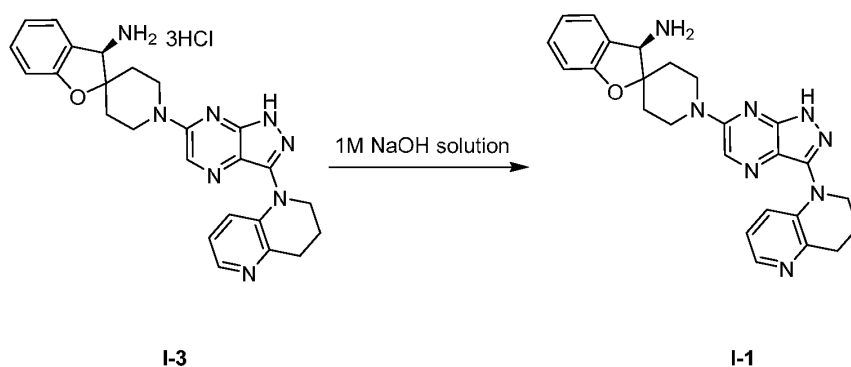
12. The compound of claim 8 or 9, wherein the compound is crystalline.

13. The compound of claim 12, wherein the compound is compound I-2 and is characterized
 20 by an XRPD pattern substantially similar to that depicted in FIG. 2A or FIG. 2B.

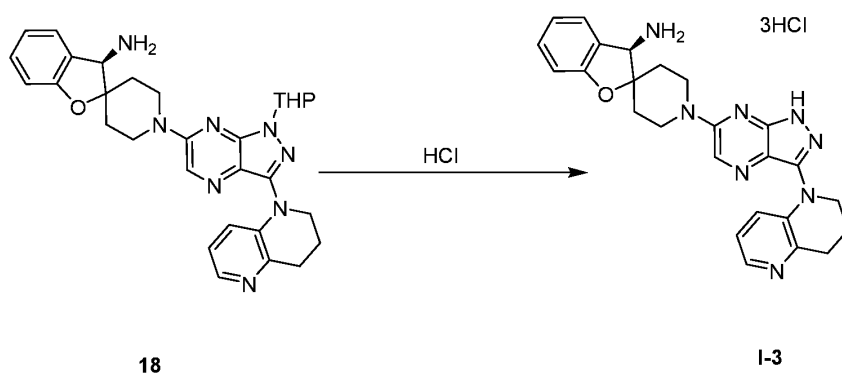
14. The compound of claim 12, wherein the compound is compound I-4 and is characterized
 by an XRPD pattern substantially similar to that depicted in FIG. 4B.

15. The compound of claim 12, wherein the compound is compound I-8 and is characterized by an XRPD pattern substantially similar to that depicted in FIG. 8A.
16. The compound of claim 12, wherein the compound is compound I-12 and is characterized by an XRPD pattern substantially similar to that depicted in FIG. 12B.
- 5 17. The compound of claim 12, wherein the compound is compound I-17 and is characterized by an XRPD pattern substantially similar to that depicted in FIG. 17A, FIG. 17C or FIG. 17D.
18. A pharmaceutical composition comprising a solid form of any of claims 1-7 or a compound of any of claims 8-17 and a pharmaceutically acceptable carrier.
- 10 19. A method of inhibiting SHP2 phosphatase activity in a subject a subject in need thereof, comprising administering a therapeutically effective amount of a solid form of any of claims 1-7, a compound of any of claims 8-17, or a pharmaceutical composition of claim 18, to the subject.
- 15 20. The method of claim 19, further comprising administering a therapeutically effective amount of an antibody, an antibody-drug conjugate, an immunomodulator, or a histone deacetylase inhibitor.
21. The method of claim 19 or 20, wherein the subject is a human.
22. A method of treating a disorder in a subject in need thereof, comprising administering a therapeutically effective amount of a solid form of any of claims 1-7, a compound of any of
- 20 claims 8-17, or a pharmaceutical composition of claim 18, to the subject.
23. The method of claim 22, further comprising administration of a therapeutically effective amount of an antibody, an antibody-drug conjugate, an immunomodulator, or a histone deacetylase inhibitor.
24. The method of claim 22 or 23, wherein the disorder is Noonan syndrome.
- 25 25. The method of claim 22 or 23, wherein the disorder is neutropenia.
26. The method of claim 22 or 23, wherein the disorder is diabetes.
27. The method of claim 22 or 23, wherein the disorder is neuroblastoma.
28. The method of claim 22 or 23, wherein the disorder is melanoma.
29. The method of claim 22 or 23, wherein the disorder is acute myeloid leukemia.
- 30 30. The method of claim 22 or 23, wherein the disorder is juvenile leukemia.
31. The method of claim 22 or 23, wherein the disorder is juvenile myelomonocytic leukemia.

32. The method of claim 22 or 23, wherein the disorder is breast cancer.
33. The method of claim 22 or 23, wherein the disorder is lung cancer.
34. The method of claim 22 or 23, wherein the disorder is colorectal cancer.
35. A kit comprising the solid form of claim 1 or a compound of any of claims 1-7.
- 5 36. The kit of claim 35, further comprising written instructions describing preparation of a pharmaceutical composition suitable for administration to a patient from the solid form or compound.
37. The kit of claim 36, further comprising written instructions describing how to administer the resulting composition to the patient.
- 10 38. The kit of claim 35, further comprising a pharmaceutically acceptable excipient.
39. A process for preparing the crystalline form of claim 3, comprising: a) preparing a solution of compound I-1 in a solvent comprising at least one of EtOH, ACN, MEK, EtOAc, IPAc, THF, MtBE, Toluene, 1,4 dioxane and water; b) heating the solution to completely dissolve the compound I-1; c) adjusting the temperature so that solid precipitates out of the
- 15 solution; and d) isolating the crystalline form of compound I-1.
40. The process of claim 39, wherein the solvent is EtOH.
41. The process of claim 39, wherein the solvent comprises ACN.
42. The process of claim 39, wherein the solvent comprises EtOAc.
43. The process of claim 39, wherein the solvent comprises IPAc.
- 20 44. The process of claim 39, wherein the solvent comprises THF.
45. The process of claim 39, wherein the solvent comprises MtBE.
46. The process of claim 39, wherein the solvent comprises Toluene.
47. The process of claim 39, wherein the solvent comprises 1,4 dioxane.
48. The process of claim 39, wherein the solvent comprises EtOH and water (9v/1v).
- 25 49. The process of claim 39, wherein heating the solution comprises heating the solution to about 50 °C.
50. The process of claim 39, wherein adjusting the temperature comprises cooling the solution to about 5 °C.
51. A process for preparing a compound of Formula I-1, the process comprising the step of
- 30 neutralizing a compound of Formula I-3 with NaOH, thereby forming the compound of Formula I-1:



52. The process of claim 51, further comprising the step of reacting a compound of Formula 18 with HCl, thereby forming the compound of Formula I-3:



53. The process of claim 51 or 52, further comprising the step of coupling a compound of Formula 17 with compound of Formula 9, thereby forming the compound of Formula 18:

