

[0007a] In a first aspect, there is provided a polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having an X-ray powder diffraction pattern comprising characteristic peaks, plus or minus 0.2 degrees 2 θ , at 17.7 degrees 2 θ and 24.9 degrees 2 θ .

[0007b] In a second aspect, there is provided a polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having an X-ray powder diffraction pattern substantially as shown in FIG. 1A.

[0007c] In a third aspect, there is provided a polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having a unit cell, as determined by crystal X-ray crystallography, of the following dimensions: $a = 12.6971(7) \text{ \AA}$; $b = 11.3577(8) \text{ \AA}$; $c = 15.2065(10) \text{ \AA}$; $\alpha = 90.00^\circ$; $\beta = 104.112^\circ$; and $\gamma = 90.00^\circ$.

~~[0007d] In a fourth aspect, there is provided a polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one which is bioequivalent to the polymorph of any one of the first to third aspects.~~

[0007de] In a ~~fifth~~fourth aspect, there is provided a composition comprising the polymorph of any one of first to ~~fourth~~third aspects, wherein the composition is substantially free of polymorphs other than polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one.

[0007ef] In a ~~sixth~~fifth aspect, there is provided a method of preparing the polymorph of any one of the first to third aspects comprising:

- combining (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one with a solvent to form a mixture;
- heating the mixture to form a solution; and
- cooling the heated solution to form the polymorph of any one of the first to third aspects.

[0007fg] In a ~~seventh~~sixth aspect, there is provided a polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having an X-ray powder diffraction pattern comprising a characteristic peak, plus or minus 0.2 degrees 2 θ , at 18.6 degrees 2 θ .

[0007gh] In an ~~eighth~~seventh aspect, there is provided a polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having an X-ray powder diffraction pattern substantially as shown in FIG. 2A.

[0007hi] In an ~~ninth-eighth~~ aspect, there is provided a polymorph of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one, wherein the polymorph is Form II having a unit cell, as determined by crystal X-ray crystallography, of the following dimensions: $a = 9.1183(3) \text{ \AA}$; $b = 11.3299(3) \text{ \AA}$; $c = 20.7936(5) \text{ \AA}$; $\alpha = 90.00^\circ$; $\beta = 98.498^\circ$; and $\gamma = 90.00^\circ$.

~~[0007j] In a tenth aspect, there is provided a polymorph of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one which is bioequivalent to the polymorph of any one of the seventh to ninth aspects.~~

[0007ik] In an ~~eleventh-ninth~~ aspect, there is provided a composition comprising the polymorph of any one of the ~~seventh-sixth~~ to ~~tenth-eighth~~ aspects, wherein the composition is substantially free of polymorphs other than polymorphic Form II of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one.

[0007il] In a ~~twelfth-tenth~~ aspect, there is provided a method of preparing the polymorph of any one of the ~~seventh-sixth~~ to ~~ninth-eighth~~ aspects, comprising:

- a) grinding polymorphic Form I of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one; and
- b) stirring the ground polymorphic Form I in a solvent to form the polymorph of any one of the ~~seventh-sixth~~ to ~~ninth-eighth~~ aspects.

[0007km] In an ~~thirteenth-eleventh~~ aspect, there is provided a method of preparing a polymorph of any one of the ~~seventh-sixth~~ to ~~ninth-eighth~~ aspects, comprising: compressing polymorphic Form I of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one at a pressure of between about 500 psi and 5000 psi to form a polymorph of any one of the ~~seventh-sixth~~ to ~~ninth-eighth~~ aspects.

[0007ln] In a ~~fourteenth-twelfth~~ aspect, there is provided a composition comprising polymorphic Form I and polymorphic Form II of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one, wherein:
the polymorphic Form I has an X-ray powder diffraction pattern comprising characteristic peaks, plus or minus 0.2 degrees 2θ , at 17.7 degrees 2θ and 24.9 degrees 2θ ; and
the polymorphic Form II has an X-ray powder diffraction pattern comprising a characteristic peak, plus or minus 0.2 degrees 2θ , at 18.6 degrees 2θ .

[0007mo] In a ~~fifteenth-thirteenth~~ aspect, there is provided a composition comprising polymorphic Form I and polymorphic Form II of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one, wherein the polymorphic Form I has an X-ray powder diffraction pattern substantially as shown in FIG. 1A, wherein the polymorphic Form II has

an X-ray powder diffraction pattern substantially as shown in FIG. 2A, wherein the composition is substantially free of polymorphs other than polymorphic Form I and polymorphic Form II of (S)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3H)-one.

[0007np] In a ~~sixteenth-fourteenth~~ aspect, there is provided a pharmaceutical composition comprising the polymorph of any one of the first to ~~fourth-third~~ aspects, and ~~seventh-sixth~~ to ~~tenth-eighth~~ aspects, and one or more pharmaceutically acceptable carriers or excipients.

[0007oq] In a ~~seventeenth-fifteenth~~ aspect, there is provided a kit comprising the polymorph of any one of the first to ~~fourth-third~~ aspects and ~~seventh-sixth~~ to ~~tenth-eighth~~ aspects, and packaging.

[0007pr] In an ~~eighteenth-sixteenth~~ aspect, there is provided a pharmaceutical composition comprising the composition of any one of the ~~fifth-fourth~~, ~~eleventh-ninth~~, ~~fourteenth-twelfth~~ and ~~fifteenth-thirteenth~~ aspects, and one or more pharmaceutical acceptable carriers or excipients.

[0007qs] In a ~~nineteenth-seventeenth~~ aspect, there is provided a use of a composition comprising the polymorph of any one of the first to ~~fourth-third~~, and ~~seventh-sixth~~ to ~~tenth-eighth~~ aspects and one or more pharmaceutically acceptable carriers or excipients in the manufacture of a medicament for treating a patient with acute lymphocytic leukemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), small lymphocytic lymphoma (SLL), myelodysplastic syndrome (MDS), myeloproliferative disease (MPD), chronic myeloid leukemia (CML), multiple myeloma (MM), indolent non-Hodgkin's lymphoma (iNHL), refractory iNHL, non-Hodgkin's lymphoma (NHL), mantle cell lymphoma (MCL), follicular lymphoma, Waldstrom's macroglobulinemia (WM), T-cell lymphoma, B-cell lymphoma, and diffuse large B-cell lymphoma (DLBCL)~~in need of a cancer treatment.~~

[0007rt] In a ~~twentieth-eighteenth~~ aspect, there is provided a use of a composition of any one of the ~~fifth-fourth~~, ~~eleventh-ninth~~, ~~fourteenth-twelfth~~ and ~~fifteenth-thirteenth~~ aspects, or a pharmaceutical composition of any one of the ~~sixteenth-fourteenth~~ and ~~eighteenth-sixteenth~~ aspects, and one or more pharmaceutically acceptable carriers or excipients in the manufacture of a medicament for treating a patient ~~with a cancer~~ acute lymphocytic leukemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), small lymphocytic lymphoma (SLL), myelodysplastic syndrome (MDS), myeloproliferative disease (MPD), chronic myeloid leukemia (CML), multiple myeloma (MM), indolent non-Hodgkin's lymphoma (iNHL), refractory iNHL, non-Hodgkin's lymphoma (NHL), mantle cell lymphoma (MCL), follicular lymphoma, Waldstrom's macroglobulinemia (WM), T-cell lymphoma, B-cell lymphoma, and diffuse large B-cell lymphoma (DLBCL).

CLAIMS

1. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having an X-ray powder diffraction pattern comprising characteristic peaks, plus or minus 0.2 degrees 2 θ , at 17.7 degrees 2 θ and 24.9 degrees 2 θ .
2. The polymorph of claim 1, wherein the X-ray powder diffraction pattern further comprises characteristic peaks, plus or minus 0.2 degrees 2 θ , at 14.3 degrees 2 θ , 17.2 degrees 2 θ , 20.9 degrees 2 θ , and 23.9 degrees 2 θ .
3. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having an X-ray powder diffraction pattern substantially as shown in FIG. 1A.
4. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having a unit cell, as determined by crystal X-ray crystallography, of the following dimensions: $a = 12.6971(7)\text{\AA}$; $b = 11.3577(8)\text{\AA}$; $c = 15.2065(10)\text{\AA}$; $\alpha = 90.00^\circ$; $\beta = 104.112^\circ$; and $\gamma = 90.00^\circ$.
5. A polymorph of any one of claims 1 to 4 obtained by:
 - a) combining (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one with a solvent to form a mixture;
 - b) heating the mixture to form a solution; and
 - c) cooling the heated solution to form the polymorph of any one of claims 1 to 4.
6. The polymorph of claim 5, wherein the mixture is heated to a temperature of at least 50°C.
7. The polymorph of claim 5 or 6, wherein the heated solution is cooled to a temperature of at least about 30°C.
8. The polymorph of any one of claims 5 to 7, wherein the solvent comprises water, an organic solvent, or a mixture thereof.

9. The polymorph of any one of claims 1 to 8, wherein the polymorph is anhydrous.
10. The polymorph of any one of claims 1 to 9, wherein the polymorph is a substantially pure polymorph.
11. A composition comprising the polymorph of any one of claims 1 to 10, wherein the composition is substantially free of polymorphs other than polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one.
12. A method of preparing the polymorph of any one of claims 1 to 10 comprising:
 - a) combining (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one with a solvent to form a mixture;
 - b) heating the mixture to form a solution; and
 - c) cooling the heated solution to form the polymorph of any one of claims 1 to 10.
13. The method of claim 12, wherein the mixture is heated to a temperature of at least about 50°C.
14. The method of claim 12 or 13, wherein the solution is cooled to a temperature of at least about 30°C.
15. The method of any one of claims 12 to 14, further comprising:
isolating the polymorph as solids;
washing the isolated solids; and
drying the washed isolated solids.
16. The method of any one of claims 12 to 15, wherein the solvent comprises water, an organic solvent, or a mixture thereof.
17. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having an X-ray powder diffraction pattern comprising a characteristic peak, plus or minus 0.2 degrees 2 θ , at 18.6 degrees 2 θ .

18. The polymorph of claim 17, wherein the X-ray powder diffraction pattern further comprises characteristic peaks, plus or minus 0.2 degrees 2θ , at 24.3 degrees 2θ and 14.0 degrees 2θ .
19. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having an X-ray powder diffraction pattern substantially as shown in FIG. 2A.
20. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having a unit cell, as determined by crystal X-ray crystallography, of the following dimensions: $a = 9.1183(3) \text{ \AA}$; $b = 11.3299(3) \text{ \AA}$; $c = 20.7936(5) \text{ \AA}$; $\alpha = 90.00^\circ$; $\beta = 98.498^\circ$; and $\gamma = 90.00^\circ$.
21. A polymorph of any one of claims 17 to 20 obtained by:
 - a) grinding polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one; and
 - b) stirring the ground polymorphic Form I in a solvent to form the polymorph of any one of claims 17 to 20.
22. The polymorph of claim 21, wherein the polymorph is obtained by further heating the stirred mixture to form the polymorph of any one of claims 17 to 20.
23. The polymorph of claim 22, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 30°C.
24. The polymorph of claim 23, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 25°C.
25. The polymorph of any one of claims 21 to 24, wherein the grinding is performed using a mortar and pestle, a high shear wet mill, a high shear dry mixer, a jet mill, a ball mill, or a combination thereof.
26. The polymorph of any one of claims 21 to 25, wherein the solvent comprises an organic solvent.

27. The polymorph of claim 26, wherein the solvent comprises acetone or isopropyl alcohol.
28. A polymorph of any one of claims 17 to 20 obtained by compressing polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one at a pressure of between about 500 psi and 5000 psi to convert at least a portion of the polymorphic Form I to a polymorph of any one of claims 17 to 20.
29. The polymorph of any one of claims 17 to 28, wherein the polymorph is anhydrous.
30. The polymorph of any one of claims 17 to 29, wherein the polymorph is a substantially pure polymorph.
31. A composition comprising the polymorph of any one of claims 17 to 30, wherein the composition is substantially free of polymorphs other than polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one.
32. A method of preparing the polymorph of any one of claims 17 to 20, comprising:
 - a) grinding polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one; and
 - b) stirring the ground polymorphic Form I in a solvent to form the polymorph of any one of claims 17 to 20.
33. The method of claim 32, further comprising heating the stirred mixture to form the polymorph of any one of claims 17 to 20.
34. The method of claim 33, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 30°C.
35. The method of claim 34, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 25°C.

36. The method of any one of claims 32 to 35, wherein the grinding is performed using a mortar and pestle, a high shear wet mill, a high shear dry mixer, a jet mill, a ball mill, or a combination thereof.
37. The method of any one of claims 32 to 36, wherein the solvent comprises an organic solvent.
38. The method of claim 37, wherein the solvent comprises acetone or isopropyl alcohol.
39. A method of preparing a polymorph of any one of claims 17 to 20, comprising:
compressing polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one at a pressure of between about 500 psi and 5000 psi to form a polymorph of any one of claims 17 to 20.
40. A composition comprising polymorphic Form I and polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein:

the polymorphic Form I has an X-ray powder diffraction pattern comprising characteristic peaks, plus or minus 0.2 degrees 2 θ , at 17.7 degrees 2 θ and 24.9 degrees 2 θ ; and

the polymorphic Form II has an X-ray powder diffraction pattern comprising a characteristic peak, plus or minus 0.2 degrees 2 θ , at 18.6 degrees 2 θ .
41. The composition of claim 40, wherein:

the X-ray powder diffraction pattern for the polymorphic Form I further comprises one or more characteristic peaks, plus or minus 0.2 degrees 2 θ , at 14.3 degrees 2 θ , 17.2 degrees 2 θ , 20.9 degrees 2 θ , and 23.9 degrees 2 θ ; and

the X-ray powder diffraction pattern for the polymorphic Form II further comprises one or more characteristic peaks, plus or minus 0.2 degrees 2 θ , at 24.3 degrees 2 θ and 14.0 degrees 2 θ .

42. The composition of claim 40 or 41, wherein the weight ratio of polymorphic Form I to polymorphic Form II is between 90:1 and 99:1.
43. A composition comprising polymorphic Form I and polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorphic Form I has an X-ray powder diffraction pattern substantially as shown in FIG. 1A, wherein the polymorphic Form II has an X-ray powder diffraction pattern substantially as shown in FIG. 2A, wherein the composition is substantially free of polymorphs other than polymorphic Form I and polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one.
44. A pharmaceutical composition comprising the polymorph of any one of claims 1 to 10, and 17 to 30, and one or more pharmaceutically acceptable carriers or excipients.
45. A kit comprising the polymorph of any one of claims 1 to 10 and 17 to 30, and packaging.
46. A pharmaceutical composition comprising the composition of any one of claims 11, 31, and 40 to 43, and one or more pharmaceutical acceptable carriers or excipients.
47. The pharmaceutical composition of claim 44 or 46, wherein the pharmaceutical composition is a tablet.
48. Use of a composition comprising the polymorph of any one of claims 1 to 10, and 17 to 30, and one or more pharmaceutically acceptable carriers or excipients in the manufacture of a medicament for treating a patient with acute lymphocytic leukemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), small lymphocytic lymphoma (SLL), myelodysplastic syndrome (MDS), myeloproliferative disease (MPD), chronic myeloid leukemia (CML), multiple myeloma (MM), indolent non-Hodgkin's lymphoma (iNHL), refractory iNHL, non-Hodgkin's lymphoma (NHL), mantle cell lymphoma (MCL),

follicular lymphoma, Waldenström's macroglobulinemia (WM), T-cell lymphoma, B-cell lymphoma, and diffuse large B-cell lymphoma (DLBCL).

49. Use of a composition of any one of claims 11, 31, and 40 to 43, or a pharmaceutical composition of any one of claims 44, 46 and 47, and one or more pharmaceutically acceptable carriers or excipients in the manufacture of a medicament for treating a patient with acute lymphocytic leukemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), small lymphocytic lymphoma (SLL), myelodysplastic syndrome (MDS), myeloproliferative disease (MPD), chronic myeloid leukemia (CML), multiple myeloma (MM), indolent non-Hodgkin's lymphoma (iNHL), refractory iNHL, non-Hodgkin's lymphoma (NHL), mantle cell lymphoma (MCL), follicular lymphoma, Waldenström's macroglobulinemia (WM), T-cell lymphoma, B-cell lymphoma, and diffuse large B-cell lymphoma (DLBCL).

50. The use of claim 48 or 49, wherein the cancer is selected from the group consisting of chronic lymphocytic leukemia (CLL), indolent non-Hodgkin's lymphoma (iNHL), and refractory iNHL.

CLAIMS

What is claimed is:

1. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having an X-ray powder diffraction pattern comprising characteristic peaks, plus or minus 0.2 degrees 2 θ , at 17.7 degrees 2 θ and 24.9 degrees 2 θ .
2. The polymorph of claim 1, wherein the X-ray powder diffraction pattern further comprises characteristic peaks, plus or minus 0.2 degrees 2 θ , at 14.3 degrees 2 θ , 17.2 degrees 2 θ , 20.9 degrees 2 θ , and 23.9 degrees 2 θ .
3. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having an X-ray powder diffraction pattern substantially as shown in FIG. 1A.
4. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form I having a unit cell, as determined by crystal X-ray crystallography, of the following dimensions: $a = 12.6971(7) \text{ \AA}$; $b = 11.3577(8) \text{ \AA}$; $c = 15.2065(10) \text{ \AA}$; $\alpha = 90.00^\circ$; $\beta = 104.112^\circ$; and $\gamma = 90.00^\circ$.
5. A polymorph of any one of claims 1 to 4 obtained by:
 - a) combining (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one with a solvent to form a mixture;
 - b) heating the mixture to form a solution; and
 - c) cooling the heated solution to form the polymorph of any one of claims 1 to 4.
6. The polymorph of claim 5, wherein the mixture is heated to a temperature of at least 50°C.
7. The polymorph of claim 5 or 6, wherein the heated solution is cooled to a temperature of at least about 30°C.
8. The polymorph of any one of claims 5 to 7, wherein the solvent comprises water, an organic solvent, or a mixture thereof.

9. The polymorph of any one of claims 1 to 8, wherein the polymorph is anhydrous.
10. The polymorph of any one of claims 1 to 9, wherein the polymorph is a substantially pure polymorph.
11. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one which is bioequivalent to the polymorph of any one of claims 1 to 10.
12. A composition comprising the polymorph of any one of claims 1 to 11, wherein the composition is substantially free of polymorphs other than polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one.
13. A method of preparing the polymorph of any one of claims 1 to 10 comprising:
 - a) combining (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one with a solvent to form a mixture;
 - b) heating the mixture to form a solution; and
 - c) cooling the heated solution to form the polymorph of any one of claims 1 to 10.
14. The method of claim 13, wherein the mixture is heated to a temperature of at least about 50°C.
15. The method of claim 13 or 14, wherein the solution is cooled to a temperature of at least about 30°C.
16. The method of any one of claims 13 to 15, further comprising:
isolating the polymorph as solids;
washing the isolated solids; and
drying the washed isolated solids.
17. The method of any one of claims 13 to 16, wherein the solvent comprises water, an organic solvent, or a mixture thereof.
18. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having an X-ray powder diffraction pattern comprising a characteristic peak, plus or minus 0.2 degrees 2θ, at 18.6 degrees 2θ.

19. The polymorph of claim 18, wherein the X-ray powder diffraction pattern further comprises characteristic peaks, plus or minus 0.2 degrees 2θ , at 24.3 degrees 2θ and 14.0 degrees 2θ .
20. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having an X-ray powder diffraction pattern substantially as shown in FIG. 2A.
21. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorph is Form II having a unit cell, as determined by crystal X-ray crystallography, of the following dimensions: $a = 9.1183(3) \text{ \AA}$; $b = 11.3299(3) \text{ \AA}$; $c = 20.7936(5) \text{ \AA}$; $\alpha = 90.00^\circ$; $\beta = 98.498^\circ$; and $\gamma = 90.00^\circ$.
22. A polymorph of any one of claims 18 to 21 obtained by:
 - a) grinding polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one; and
 - b) stirring the ground polymorphic Form I in a solvent to form the polymorph of any one of claims 18 to 21.
23. The polymorph of claim 22, wherein the polymorph is obtained by further heating the stirred mixture to form the polymorph of any one of claims 18 to 21.
24. The polymorph of claim 23, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 30°C .
25. The polymorph of claim 24, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 25°C .
26. The polymorph of any one of claims 22 to 25, wherein the grinding is performed using a mortar and pestle, a high shear wet mill, a high shear dry mixer, a jet mill, a ball mill, or a combination thereof.
27. The polymorph of any one of claims 22 to 26, wherein the solvent comprises an organic solvent.

28. The polymorph of claim 27, wherein the solvent comprises acetone or isopropyl alcohol.
29. A polymorph of any one of claims 18 to 21 obtained by compressing polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one at a pressure of between about 500 psi and 5000 psi to convert at least a portion of the polymorphic Form I to a polymorph of any one of claims 18 to 21.
30. The polymorph of any one of claims 18 to 29, wherein the polymorph is anhydrous.
31. The polymorph of any one of claims 18 to 30, wherein the polymorph is a substantially pure polymorph.
32. A polymorph of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one which is bioequivalent to the polymorph of any one of claims 18 to 31.
33. A composition comprising the polymorph of any one of claims 18 to 32, wherein the composition is substantially free of polymorphs other than polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one.
34. A method of preparing the polymorph of any one of claims 18 to 21, comprising:
- a) grinding polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one; and
 - b) stirring the ground polymorphic Form I in a solvent to form the polymorph of any one of claims 18 to 21.
35. The method of claim 34, further comprising heating the stirred mixture to form the polymorph of any one of claims 18 to 21.
36. The method of claim 35, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 30°C.
37. The method of claim 36, wherein the ground polymorphic Form I is stirred in the solvent at a temperature of between about 10°C and 25°C.

38. The method of any one of claims 34 to 37, wherein the grinding is performed using a mortar and pestle, a high shear wet mill, a high shear dry mixer, a jet mill, a ball mill, or a combination thereof.
39. The method of any one of claims 34 to 38, wherein the solvent comprises an organic solvent.
40. The method of claim 39, wherein the solvent comprises acetone or isopropyl alcohol.
41. A method of preparing a polymorph of any one of claims 18 to 21, comprising:
compressing polymorphic Form I of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one at a pressure of between about 500 psi and 5000 psi to form a polymorph of any one of claims 18 to 21.
42. A composition comprising polymorphic Form I and polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein:

the polymorphic Form I has an X-ray powder diffraction pattern comprising characteristic peaks, plus or minus 0.2 degrees 2θ , at 17.7 degrees 2θ and 24.9 degrees 2θ ; and

the polymorphic Form II has an X-ray powder diffraction pattern comprising a characteristic peak, plus or minus 0.2 degrees 2θ , at 18.6 degrees 2θ .
43. The composition of claim 42, wherein:

the X-ray powder diffraction pattern for the polymorphic Form I further comprises one or more characteristic peaks, plus or minus 0.2 degrees 2θ , at 14.3 degrees 2θ , 17.2 degrees 2θ , 20.9 degrees 2θ , and 23.9 degrees 2θ ; and

the X-ray powder diffraction pattern for the polymorphic Form II further comprises one or more characteristic peaks, plus or minus 0.2 degrees 2θ , at 24.3 degrees 2θ and 14.0 degrees 2θ .

44. The composition of claim 42 or 43, wherein the weight ratio of polymorphic Form I to polymorphic Form II is between 90:1 and 99:1.
45. A composition comprising polymorphic Form I and polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one, wherein the polymorphic Form I has an X-ray powder diffraction pattern substantially as shown in FIG. 1A, wherein the polymorphic Form II has an X-ray powder diffraction pattern substantially as shown in FIG. 2A, wherein the composition is substantially free of polymorphs other than polymorphic Form I and polymorphic Form II of (*S*)-2-(1-(9H-purin-6-ylamino)propyl)-5-fluoro-3-phenylquinazolin-4(3*H*)-one.
46. A pharmaceutical composition comprising the polymorph of any one of claims 1 to 11, and 18 to 32, and one or more pharmaceutically acceptable carriers or excipients.
47. A kit comprising the polymorph of any one of claims 1 to 11 and 18 to 32, and packaging.
48. A pharmaceutical composition comprising the composition of any one of claims 12, 33, and 42 to 45, and one or more pharmaceutical acceptable carriers or excipients.
49. The pharmaceutical composition of claim 46 or 48, wherein the pharmaceutical composition is a tablet.
50. Use of a composition comprising the polymorph of any one of claims 1 to 11, and 18 to 32, and one or more pharmaceutically acceptable carriers or excipients in the manufacture of a medicament for treating a patient in need of a cancer treatment.
51. Use of a composition of any one of claims 12, 33, and 42 to 45, or a pharmaceutical composition of any one of claims 46, 48 and 49, and one or more pharmaceutically acceptable carriers or excipients in the manufacture of a medicament for treating a patient with a cancer.
52. The use of claim 50 or 51, wherein the cancer is a hematologic malignancy.

53. The use of claim 50 or 51, wherein the cancer is selected from the group consisting of acute lymphocytic leukemia (ALL), acute myeloid leukemia (AML), chronic lymphocytic leukemia (CLL), small lymphocytic lymphoma (SLL), myelodysplastic syndrome (MDS), myeloproliferative disease (MPD), chronic myeloid leukemia (CML), multiple myeloma (MM), indolent non-Hodgkin's lymphoma (iNHL), refractory iNHL, non-Hodgkin's lymphoma (NHL), mantle cell lymphoma (MCL), follicular lymphoma, Waldstrom's macroglobulinemia (WM), T-cell lymphoma, B-cell lymphoma, and diffuse large B-cell lymphoma (DLBCL).
54. The use of claim 50 or 51, wherein the cancer is selected from the group consisting of chronic lymphocytic leukemia (CLL), indolent non-Hodgkin's lymphoma (iNHL), and refractory iNHL.