What is claimed is:

1. ~~A method of treating cancer, comprising administering to a patient in need thereof a therapeutically effective amount of~~ Use of (S)-3-(4-((4-(morpholinomethyl)benzyl)oxy)-1-oxoisoindolin-2-yl)piperidine-2,6-dione (Compound 5), or a stereoisomer or mixture of stereoisomers, pharmaceutically acceptable salt, tautomer, prodrug, solvate, hydrate, co-crystal, clathrate, or polymorph thereof, in the manufacture of a medicament for treating cancer in combination with a second agent, wherein the second active agent is one or more of a PLK1 inhibitor, a BRD4 inhibitor, a BET inhibitor, an NEK2 inhibitor, an AURKB inhibitor, an MEK inhibitor, a PHF19 inhibitor, a BTK inhibitor, an mTOR inhibitor, a PIM inhibitor, an IGF-1R inhibitor, an XPO1 inhibitor, a DOT1L inhibitor, an EZH2 inhibitor, a JAK2 inhibitor, a BIRC5 inhibitor, or a DNA methyltransferase inhibitor.

2. ~~A method of treating cancer, comprising administering to a patient in need thereof a therapeutically effective amount of~~ Use of (S)-4-(4-(4-(((2-(2,6-dioxopiperidin-3-yl)-1-oxoisoindolin-4-yl)oxy)methyl)benzyl)piperazin-1-yl)-3-fluorobenzonitrile (Compound 6), or a stereoisomer or mixture of stereoisomers, pharmaceutically acceptable salt, tautomer, prodrug, solvate, hydrate, co-crystal, clathrate, or polymorph thereof, in the manufacture of a medicament for treating cancer in combination with a second agent, wherein the second active agent is one or more of a PLK1 inhibitor, a BRD4 inhibitor, a BET inhibitor, an NEK2 inhibitor, an AURKB inhibitor, an MEK inhibitor, a PHF19 inhibitor, a BTK inhibitor, an mTOR inhibitor, a PIM inhibitor, an IGF-1R inhibitor, an XPO1 inhibitor, a DOT1L inhibitor, an EZH2 inhibitor, a JAK2 inhibitor, a BIRC5 inhibitor, or a DNA methyltransferase inhibitor.

3. ~~A method of treating cancer, comprising administering to a patient in need thereof a therapeutically effective amount of~~ Use of 4-amino-2-(2,6-dioxopiperidine-3-yl)isoindoline-1,3-dione (Compound 1), or a stereoisomer or mixture of stereoisomers, pharmaceutically acceptable salt, tautomer, prodrug, solvate, hydrate, co-crystal, clathrate, or polymorph thereof, in the manufacture of a medicament for treating cancer in combination with a second agent, wherein the second active agent is one or more of a PLK1 inhibitor, a BRD4 inhibitor, a BET inhibitor,

an NEK2 inhibitor, an AURKB inhibitor, an MEK inhibitor, a PHF19 inhibitor, a BTK inhibitor, an mTOR inhibitor, a PIM inhibitor, an IGF-1R inhibitor, an XPO1 inhibitor, a DOT1L inhibitor, an EZH2 inhibitor, a JAK2 inhibitor, a BIRC5 inhibitor, or a DNA methyltransferase inhibitor.

4. ~~A method of treating cancer, comprising administering to a patient in need thereof a therapeutically effective amount of~~ Use of 3-(4-amino-1-oxo-1,3 dihydro-isoindol-2-yl)-piperidine-2,6-dione (Compound 2), or a stereoisomer or mixture of stereoisomers, pharmaceutically acceptable salt, tautomer, prodrug, solvate, hydrate, co-crystal, clathrate, or polymorph thereof, in the manufacture of a medicament for treating cancer in combination with a second agent, wherein the second active agent is one or more of a PLK1 inhibitor, a BRD4 inhibitor, a BET inhibitor, an NEK2 inhibitor, an AURKB inhibitor, an MEK inhibitor, a PHF19 inhibitor, a BTK inhibitor, an mTOR inhibitor, a PIM inhibitor, an IGF-1R inhibitor, an XPO1 inhibitor, a DOT1L inhibitor, an EZH2 inhibitor, a JAK2 inhibitor, a BIRC5 inhibitor, or a DNA methyltransferase inhibitor.

5. ~~A method of treating cancer, comprising administering to a patient in need thereof a therapeutically effective amount of~~ Use of 2-(2,6-dioxo-3-piperidinyl)-1H-isoindole-1,3(2H)-dione (Compound 3), or a stereoisomer or mixture of stereoisomers, pharmaceutically acceptable salt, tautomer, prodrug, solvate, hydrate, co-crystal, clathrate, or polymorph thereof, in the manufacture of a medicament for treating cancer in combination with a second agent, wherein the second active agent is one or more of a PLK1 inhibitor, a BRD4 inhibitor, a BET inhibitor, an NEK2 inhibitor, an AURKB inhibitor, an MEK inhibitor, a PHF19 inhibitor, a BTK inhibitor, an mTOR inhibitor, a PIM inhibitor, an IGF-1R inhibitor, an XPO1 inhibitor, a DOT1L inhibitor, an EZH2 inhibitor, a JAK2 inhibitor, a BIRC5 inhibitor, or a DNA methyltransferase inhibitor.

6. ~~A method of treating cancer, comprising administering to a patient in need thereof a therapeutically effective amount of~~ Use of 3-(5-amino-2-methyl-4-oxo-4H-quinazolin-3-yl)-piperidine-2,6-dione (Compound 4), or a stereoisomer or mixture of stereoisomers,

pharmaceutically acceptable salt, tautomer, prodrug, solvate, hydrate, co-crystal, clathrate, or polymorph thereof, in the manufacture of a medicament for treating cancer in combination with a second agent, wherein the second active agent is one or more of a PLK1 inhibitor, a BRD4 inhibitor, a BET inhibitor, an NEK2 inhibitor, an AURKB inhibitor, an MEK inhibitor, a PHF19 inhibitor, a BTK inhibitor, an mTOR inhibitor, a PIM inhibitor, an IGF-1R inhibitor, an XPO1 inhibitor, a DOT1L inhibitor, an EZH2 inhibitor, a JAK2 inhibitor, a BIRC5 inhibitor, or a DNA methyltransferase inhibitor.

7. ~~A method of treating cancer, comprising administering to a patient in need thereof a therapeutically effective amount of~~ Use of 2-(4-chlorophenyl)-N-((2-(2,6-dioxopiperidin-3-yl)-1-oxoisoindolin-5-yl)methyl)-2,2-difluoroacetamide (Compound 7), or a stereoisomer or mixture of stereoisomers, pharmaceutically acceptable salt, tautomer, prodrug, solvate, hydrate, co-crystal, clathrate, or polymorph thereof, in the manufacture of a medicament for treating cancer in combination with a second agent, wherein the second active agent is one or more of a PLK1 inhibitor, a BRD4 inhibitor, a BET inhibitor, an NEK2 inhibitor, an AURKB inhibitor, an MEK inhibitor, a PHF19 inhibitor, a BTK inhibitor, an mTOR inhibitor, a PIM inhibitor, an IGF-1R inhibitor, an XPO1 inhibitor, a DOT1L inhibitor, an EZH2 inhibitor, a JAK2 inhibitor, a BIRC5 inhibitor, or a DNA methyltransferase inhibitor.

8. The ~~method~~ use of any one of claims 1 to 7, wherein the second agent is a PLK1 inhibitor.

9. The ~~method~~ use of claim 8, wherein the PLK1 inhibitor is BI2536, volasertib, CYC140, onvansertib, GSK461364, or TAK960, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

10. The ~~method~~ use of claim 9, wherein the PLK1 inhibitor is BI2536.

11. The ~~method~~ use of any one of claims 1 to 7, wherein the second agent is a BRD4 inhibitor.

12. The ~~method~~ use of claim 11, wherein the BRD4 inhibitor is JQ1.

13. The ~~method~~ use of any one of claims 1 to 7, wherein the second agent is a BET inhibitor.

14. The ~~method~~ use of claim 13, wherein the BET inhibitor is birabresib, 4-[2-(cyclopropylmethoxy)-5-(methanesulfonyl)phenyl]-2-methylisoquinolin-1(2H)-one (Compound A), BMS-986158, RO-6870810, CPI-0610, or molibresib, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

15. The ~~method~~ use of any one of claims 1 to 7, wherein the second agent is an NEK2 inhibitor.

16. The ~~method~~ use of claim 15, wherein the NEK2 inhibitor is JH-295.

17. The ~~method~~ use of claim 15, wherein the NEK2 inhibitor is rac-CCT 250863.

18. The ~~method~~ use of any one of claims 1 to 7, wherein the second agent is an Aurora Kinase B (AURKB) inhibitor.

19. The ~~method~~ use of claim 18, wherein the AURKB inhibitor is barasertib, AZD1152-HQPA, alisertib, danusertib, AT9283, PF-03814735, AMG900, tozasertib, ZM447439, MLN8054, hesperidin, SNS-314, PHA-680632, CYC116, GSK1070916, TAK-901, or CCT137690, or molibresib, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

20. The ~~method~~ use of any one of claims 1 to 7, wherein the second agent is a MEK inhibitor.

21. The ~~method~~ use of claim 20, wherein the MEK inhibitor interrupts the function of the RAF/RAS/MEK signal transduction cascade.

22. The ~~method~~ use of claim 20, wherein the MEK inhibitor is trametinib, trametinib dimethyl sulfoxide, cobimetinib, binimetinib, or selumetinib, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

23. The ~~method~~ use of any one of claims 1 to 7, wherein the second agent is a PHF19 inhibitor.

24. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is a BTK inhibitor.

25. The ~~method~~ use of claim 24, wherein the BTK inhibitor is ibrutinib, or acalabrutinib, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

26. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is an mTOR inhibitor.

27. The ~~method~~ use of claim 26, wherein the mTOR inhibitor is rapamycin or an analog thereof (also termed rapalog).

28. The ~~method~~ use of claim 26, wherein the mTOR inhibitor is everolimus.

29. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is a PIM inhibitor.

30. The ~~method~~ use of claim 29, wherein the PIM inhibitor is LGH-447, AZD1208, SGI-1776, or TP-3654, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

31. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is an IGF-1R inhibitor.

32. The ~~method~~ use of claim 31, wherein the IGF-1R inhibitor is linsitinib.

33. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is an XPO1 inhibitor.

34. The ~~method~~ use of claim 33, wherein the XPO1 inhibitor is selinexor.

35. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is a DOT1L inhibitor.

36. The ~~method~~ use of claim 35, wherein the DOT1L inhibitor is SGC0946, or pinometostat, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

37. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is an EZH2 inhibitor.

38. The ~~method~~ use of claim 37, wherein the EZH2 inhibitor is tazemetostat, 3-deazaneplanocin A (DZNep), EPZ005687, EI1, GSK126, UNC1999, CPI-1205, or sinefungin, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

39. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is a JAK2 inhibitor.

40. The ~~method~~ use of claim 39, wherein the JAK2 inhibitor is fedratinib, ruxolitinib, baricitinib, gandotinib, lestaurtinib, momelotinib, or pacritinib, or a stereoisomer, mixture of stereoisomers, tautomer, isotopolog, or pharmaceutically acceptable salt thereof.

41. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is a BIRC5 inhibitor.

42. The ~~method~~ use of claim 41, wherein the BIRC5 inhibitor is YM155.

43. The ~~method~~ use of any one of claims 1 to 7, wherein the second active agent is a DNA methyltransferase inhibitor.

44. The ~~method~~ use of claim 43, wherein the DNA methyltransferase inhibitor is azacitidine.

45. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is a hematological malignancy.

46. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is a B-cell malignancy.

47. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is lymphoma.

48. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is diffuse large B-cell lymphoma (DLBCL).

49. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is Mantle Cell Lymphoma (MCL).

50. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is Marginal Zone Lymphoma (MZL).

51. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is indolent follicular cell lymphoma (iFCL).

52. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is T-cell lymphoma.

53. The ~~method~~ use of any one of claims 1 to 44, wherein the cancer is multiple myeloma.

54. The ~~method~~ use of claim 53, wherein the multiple myeloma is relapsed or refractory.

55. The ~~method~~ use of claim 53, wherein the multiple myeloma is refractory to lenalidomide.

56. The ~~method~~ use of claim 53, wherein the multiple myeloma is newly diagnosed multiple myeloma.

57. The ~~method~~ use of claim 53, wherein the multiple myeloma is refractory to pomalidomide.

58. The ~~method~~ use of claim 57, wherein the multiple myeloma is refractory to pomalidomide when used in combination with a proteasome inhibitor.

59. The ~~method~~ use of claim 58, wherein the proteasome inhibitor is selected from bortezomib, carfilzomib, and ixazomib.

60. The ~~method~~ use of claim 57, wherein the multiple myeloma is refractory to pomalidomide when used in combination with an inflammatory steroid.

61. The ~~method~~ use of claim 60, wherein the inflammatory steroid is selected from dexamethasone or prednisone.

62. The ~~method~~ use of claim 57, wherein the multiple myeloma is refractory to pomalidomide when used in combination with a CD38 directed monoclonal antibody.

63. The ~~method~~ use of any one of claims 1 to 62, ~~additionally comprising administering to the patient an additional active~~ wherein the medicament is used in further combination with a third agent.

64. The ~~method~~ use of claim 63, wherein the third agent is a steroid.

65. A method of identifying a subject having a hematological cancer who is likely to be responsive to a treatment compound in combination with a second agent, or predicting the responsiveness of a subject having a hematological cancer to a treatment compound in combination with a second agent, comprising:

a. obtaining a sample from the subject;
b. determining a biomarker level in the sample; and
c. diagnosing the subject as being likely to be responsive to the treatment compound in combination with the second agent if the biomarker level is an altered level relative to a reference level of the biomarker.

66. Use of a treatment compound in the manufacture of a medicament for ~~A method of~~ selectively treating a hematological cancer in a subject having a hematological cancer, ~~comprising~~wherein:

a. ~~obtaining~~ a sample is to be obtained from the subject;
b. ~~determining~~ a biomarker level is to be determined in the sample;
c. ~~diagnosing~~ the subject is to be diagnosed as being likely to be responsive to the treatment compound in combination with ~~the~~ a second agent if the biomarker level is an altered level relative to a reference level of the biomarker; and
d. ~~administering~~ a therapeutically effective amount of the treatment compound is to be administered in combination with the second agent to the subject diagnosed as being likely to be responsive to the treatment compound in combination with the second agent.

67. The method of claim 65 or use of claim 66, wherein the biomarker is expression of a gene or a combination of genes selected from: BRD4, PLK1, AURKB, PHF19, NEK2, MEK, BTK, MTOR, PIM, IGF-1R, XPO1, DOT1L, EZH2, JAK2, and BIRC5.