

WHAT IS CLAIMED IS:

1. A method of treating a patient having cancer, the method comprising administering to the patient a therapeutically effective amount of TG02, wherein one or more of the genes listed in Table 1 is differentially present in a biological sample taken from the patient as compared with a biological sample taken from a subject of another phenotypic status.

2. The method of claim 1, wherein MYC overexpression is differentially present in a sample taken from the patient.

3. The method of claims 1 or 2, wherein MCL1 overexpression is differentially present in a sample taken from the patient.

4. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of an immune checkpoint inhibitor.

5. The method of claim 4, wherein TG02 is administered to the patient before an immune checkpoint inhibitor.

6. The method of claim 4, wherein TG02 is administered to the patient after an immune checkpoint inhibitor.

7. The method of claim 4, wherein TG02 is administered to the patient at the same time as an immune checkpoint inhibitor.

8. The method of any one of claims 4-7, wherein the immune checkpoint inhibitor is selected from the group consisting of a PD-1 inhibitor, a PD-L1 inhibitor, a CTLA-4 inhibitor, a LAG3 inhibitor, a TIM3 inhibitor, and a cd47 inhibitor.

9. The method of claim 8, wherein the immune checkpoint inhibitor is a PD-1 inhibitor.

10. The method of claim 9, wherein the PD-1 inhibitor is an anti-PD-1 antibody.

11. The method of claim 10, wherein the anti-PD-1 antibody is selected from the group consisting of nivolumab, pembrolizumab, pidilizumab and STI-1110.

12. The method of claim 8, wherein the immune checkpoint inhibitor is a PD-L1 inhibitor.

13. The method of claim 12, wherein the PD-L1 inhibitor is an anti-PD-L1 antibody.

14. The method of claim 12, wherein the anti-PD-L1 antibody is selected from the group consisting of avelumab, atezolizumab, durvalumab, and STI-1014

15. The method of claim 8, wherein the immune checkpoint inhibitor is an anti-CTLA-4 inhibitor.

16. The method of claim 15, wherein the CTLA-4 inhibitor is an anti-CTLA-4 antibody.

17. The method of claim 16, wherein the anti-CTLA-4 antibody is selected from the group consisting of ipilimumab and tremelimumab.

18. The method of claim 8, wherein immune checkpoint inhibitor is a LAG3 inhibitor.

19. The method of claim 18, wherein the LAG3 inhibitor is an anti-LAG3 antibody.
20. The method of claim 19, wherein the anti-LAG3 antibody is GSK2831781.
21. The method of claim 20, wherein the immune checkpoint inhibitor is a TIM3 inhibitor.
22. The method of claim 21, wherein the TIM3 inhibitor is an anti-TIM3 antibody.
23. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of an alkylating agent.
24. The method of claim 23, wherein TG02 is administered to the patient before the alkylating agent.
25. The method of claim 23, wherein TG02 is administered to the patient after the alkylating agent.
26. The method of claim 23, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the alkylating agent.
27. The method of any one of claims 23-26, wherein the alkylating agent is temozolimide.
28. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of a protein kinase inhibitor.

29. The method of claim 28, wherein TG02 is administered to the patient before the protein kinase inhibitor.

30. The method of claim 28, wherein TG02 is administered to the patient after the protein kinase inhibitor.

31. The method of claim 28, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the protein kinase inhibitor.

32. The method of any one of claims 28-31, wherein the protein kinase inhibitor is sorafenib.

33. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of a proteasome inhibitor.

34. The method of claim 33, wherein TG02 is administered to the patient before the proteasome inhibitor.

35. The method of claim 33, wherein TG02 is administered to the patient after the proteasome inhibitor.

36. The method of claim 33, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the proteasome inhibitor.

37. The method of any one of claims 33-36, wherein the proteasome inhibitor is bortezomib.

38. The method of any one of claims 33-36, wherein the proteasome inhibitor is carfilizomib.

39. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of a topoisomerase II inhibitor.

40. The method of claim 39, wherein TG02 is administered to the patient before the topoisomerase II inhibitor.

41. The method of claim 39, wherein TG02 is administered to the patient after the topoisomerase II inhibitor.

42. The method of claim 39, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the topoisomerase II inhibitor.

43. The method of any one of claims 39-42, wherein the topoisomerase II inhibitor is doxorubicin.

44. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of a platinum coordinating complex.

45. The method of claim 44, wherein TG02 is administered to the patient before the platinum coordinating complex.

46. The method of claim 44, wherein TG02 is administered to the patient after the platinum coordinating complex.

47. The method of claim 44, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the platinum coordinating complex.

48. The method of any one of claims 44-47, wherein the platinum coordinating complex is cisplatin.

49. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of lenalidomide.

50. The method of claim 49, wherein TG02 is administered to the patient before lenalidomide.

51. The method of claim 49, wherein TG02 is administered to the patient after lenalidomide.

52. The method of claim 49, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as lenalidomide.

53. The method of any one of claims 1-3 further comprising administering to the patient a therapeutically effective amount of radiotherapy.

54. The method of claim 53, wherein TG02 is administered to the patient before radiotherapy.

55. The method of claim 53, wherein TG02 is administered to the patient after radiotherapy.

56. The method of claim 53, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as radiotherapy.

57. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and an immune checkpoint inhibitor.

58. The method of claim 57, wherein TG02 is administered to the patient before the immune checkpoint inhibitor.

59. The method of claim 57, wherein TG02 is administered to the patient after the immune checkpoint inhibitor.

60. The method of claim 57, wherein TG02 is administered to the patient at the same time as the immune checkpoint inhibitor.

61. The method of any one of claims 57-60, wherein immune checkpoint inhibitor is selected from the group consisting of a PD-1 inhibitor, a PD-L1 inhibitor, a CTLA-4 inhibitor, a LAG3 inhibitor, and a TIM3 inhibitor.

62. The method of 61, wherein the immune checkpoint inhibitor is a PD-1 inhibitor.

63. The method of claim 62, wherein the PD-1 inhibitor is an anti-PD-1 antibody.

64. The method of claim 63, wherein the anti-PD-1 antibody is selected from the group consisting of nivolumab, pembrolizumab, pidilizumab and STI-1110.

65. The method of claim 61, wherein the immune checkpoint inhibitor is a PD-L1 inhibitor.

66. The method of claim 65, wherein the PD-L1 inhibitor is an anti-PD-L1 antibody.

67. The method of claim 66, wherein the anti-PD-L1 antibody is selected from the group consisting of avelumab, atezolizumab, durvalumab, and STI-1014

68. The method of claim 61, wherein the immune checkpoint inhibitor is an anti-CTLA-4 inhibitor.

69. The method of claim 68, wherein the CTLA-4 inhibitor is an anti-CTLA-4 antibody.

70. The method of claim 69, wherein the anti-CTLA-4 antibody is selected from the group consisting of ipilimumab and tremelimumab.

71. The method of claim 61, wherein the immune checkpoint inhibitor is a LAG3 inhibitor.

72. The method of claim 71, wherein the LAG3 inhibitor is an anti-LAG3 antibody.

73. The method of claim 72, wherein the anti-LAG3 antibody is GSK2831781.

74. The method of claim 61, wherein the immune checkpoint inhibitor is a TIM3 inhibitor.

75. The method of claim 74, wherein the TIM3 inhibitor is an anti-TIM3 antibody.

76. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and an alkylating agent.

77. The method of claim 76, wherein TG02 is administered to the patient before the alkylating agent.

78. The method of claim 76, wherein TG02 is administered to the patient after the alkylating agent.

79. The method of claim 76, wherein TG02 is administered to the patient at the same time as the alkylating agent.

80. The method of any one of claims 76-79, wherein the alkylating agent is temozolimide.

81. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and a protein kinase inhibitor.

82. The method of claim 81, wherein TG02 is administered to the patient before the protein kinase inhibitor.

83. The method of claim 81, wherein TG02 is administered to the patient after the protein kinase inhibitor.

84. The method of claim 81, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the protein kinase inhibitor.

85. The method of any one of claims 77-80, wherein the protein kinase inhibitor is sorafenib.

86. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and a proteasome inhibitor.

87. The method of claim 86, wherein TG02 is administered to the patient before the proteasome inhibitor.

88. The method of claim 86, wherein TG02 is administered to the patient after the proteasome inhibitor.

89. The method of claim 86, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the proteasome inhibitor.

90. The method of any one of claims 86-89, wherein the proteasome inhibitor is bortezomib.

91. The method of any one of claims 86-89, wherein the proteasome inhibitor is carfilizomib.

92. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and a topoisomerase II inhibitor.

93. The method of claim 92, wherein TG02 is administered to the patient before the topoisomerase II inhibitor.

94. The method of claim 92, wherein TG02 is administered to the patient after the topoisomerase II inhibitor.

95. The method of claim 92, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the topoisomerase II inhibitor.

96. The method of any one of claims 92-95, wherein the topoisomerase II inhibitor is doxorubicin.

97. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and a platinum coordinating complex.

98. The method of claim 97, wherein TG02 is administered to the patient before the platinum coordinating complex.

99. The method of claim 97, wherein TG02 is administered to the patient after the platinum coordinating complex.

100. The method of claim 97, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as the platinum coordinating complex.

101. The method of any one of claims 97-100, wherein the platinum coordinating complex is cisplatin.

102. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and lenalidomide.

103. The method of claim 102, wherein TG02 is administered to the patient before lenalidomide.

104. The method of claim 102, wherein TG02 is administered to the patient after lenalidomide.

105. The method of claim 102, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as lenalidomide.

106. A method of treating a patient having cancer, the method comprising administering to the patient therapeutically effective amounts of TG02 and radiotherapy.

107. The method of claim 106, wherein TG02 is administered to the patient before radiotherapy.

108. The method of claim 106, wherein TG02 is administered to the patient after radiotherapy.

109. The method of claim 106, wherein a therapeutically effective amount of TG02 is administered to the patient at the same time as radiotherapy.

110. The method of any one of claims 1-109, wherein the cancer is a solid tumor.

111. The method of any one of claims 1-109, wherein the cancer is a hematological malignancy.

112. The method of any one of claims 1-109, wherein the cancer selected from the group consisting of adrenal cancer, acinic cell carcinoma, acoustic neuroma, acral lentiginous melanoma, acrospiroma, acute eosinophilic leukemia, acute erythroid leukemia, acute lymphoblastic leukemia, acute megakaryoblastic leukemia, acute monocytic leukemia, acute promyelocytic leukemia, adenocarcinoma, adenoid cystic carcinoma, adenoma, adenomatoid odontogenic tumor, adenosquamous carcinoma, adipose tissue neoplasm, adrenocortical carcinoma, adult T-cell leukemia/lymphoma, aggressive NK-cell leukemia, AIDS-related lymphoma, alveolar rhabdomyosarcoma, alveolar soft part sarcoma, ameloblastic fibroma, anaplastic large cell lymphoma, anaplastic thyroid cancer, angioimmunoblastic T-cell lymphoma, angiomyolipoma, angiosarcoma, astrocytoma, atypical teratoid rhabdoid tumor, B-cell chronic lymphocytic leukemia, B-cell prolymphocytic leukemia, B-cell lymphoma, basal cell carcinoma, biliary tract cancer, bladder cancer, blastoma, bone cancer, Brenner tumor, Brown tumor, Burkitt's lymphoma, breast cancer, brain cancer, carcinoma, carcinoma in situ, carcinosarcoma, cartilage tumor, cementoma, myeloid sarcoma, chondroma, chordoma, choriocarcinoma, choroid plexus papilloma, clear-cell sarcoma of the kidney, craniopharyngioma, cutaneous T-cell lymphoma, cervical cancer, colorectal cancer, Degos disease, desmoplastic small round cell tumor, diffuse large B-cell lymphoma, dysembryoplastic neuroepithelial tumor, dysgerminoma, embryonal carcinoma, endocrine gland neoplasm, endodermal sinus tumor, enteropathy-associated T-cell lymphoma, esophageal cancer, fetus in fetu, fibroma, fibrosarcoma, follicular lymphoma, follicular thyroid cancer, ganglioneuroma, gastrointestinal cancer, germ cell tumor, gestational choriocarcinoma, giant cell fibroblastoma, giant cell tumor of the bone, glial tumor, glioblastoma, glioma, gliomatosis cerebri, glucagonoma, gonadoblastoma, granulosa cell tumor, gynandroblastoma, gallbladder cancer, gastric cancer, hairy cell leukemia, hemangioblastoma, head and neck cancer, hemangiopericytoma, hematological malignancy, hepatoblastoma, hepatocellular carcinoma, hepatosplenic T-cell lymphoma, Hodgkin's lymphoma, non-Hodgkin's lymphoma, invasive lobular carcinoma, intestinal cancer, kidney cancer, laryngeal cancer, lentigo maligna, lethal midline carcinoma, leukemia, leydig cell tumor, liposarcoma, lung cancer, lymphangioma, lymphangiosarcoma, lymphoepithelioma, lymphoma, acute lymphocytic leukemia, acute myelogenous leukemia, chronic lymphocytic leukemia, liver cancer, small cell

lung cancer, non-small cell lung cancer, MALT lymphoma, malignant fibrous histiocytoma, malignant peripheral nerve sheath tumor, malignant triton tumor, mantle cell lymphoma, marginal zone B-cell lymphoma, mast cell leukemia, mediastinal germ cell tumor, medullary carcinoma of the breast, medullary thyroid cancer, medulloblastoma, melanoma, meningioma, merkel cell cancer, mesothelioma, metastatic urothelial carcinoma, mixed Mullerian tumor, mucinous tumor, multiple myeloma, muscle tissue neoplasm, mycosis fungoides, myxoid liposarcoma, myxoma, myxosarcoma, nasopharyngeal carcinoma, neurinoma, neuroblastoma, neurofibroma, neuroma, nodular melanoma, ocular cancer, oligoastrocytoma, oligodendroglioma, oncocytoma, optic nerve sheath meningioma, optic nerve tumor, oral cancer, osteosarcoma, ovarian cancer, Pancoast tumor, papillary thyroid cancer, paraganglioma, pinealoblastoma, pineocytoma, pituicytoma, pituitary adenoma, pituitary tumor, plasmacytoma, polyembryoma, precursor T-lymphoblastic lymphoma, primary central nervous system lymphoma, primary effusion lymphoma, preimary peritoneal cancer, prostate cancer, pancreatic cancer, pharyngeal cancer, pseudomyxoma peritonei, renal cell carcinoma, renal medullary carcinoma, retinoblastoma, rhabdomyoma, rhabdomyosarcoma, Richter's transformation, rectal cancer, sarcoma, Schwannomatosis, seminoma, Sertoli cell tumor, sex cord-gonadal stromal tumor, signet ring cell carcinoma, skin cancer, small blue round cell tumors, small cell carcinoma, soft tissue sarcoma, somatostatinoma, soot wart, spinal tumor, splenic marginal zone lymphoma, squamous cell carcinoma, synovial sarcoma, Sezary's disease, small intestine cancer, squamous carcinoma, stomach cancer, T-cell lymphoma, testicular cancer, thecoma, thyroid cancer, transitional cell carcinoma, throat cancer, urachal cancer, urogenital cancer, urothelial carcinoma, uveal melanoma, uterine cancer, verrucous carcinoma, visual pathway glioma, vulvar cancer, vaginal cancer, Waldenstrom's macroglobulinemia, Warthin's tumor, and Wilms' tumor.

113. The method of claim 112, wherein the cancer is selected from the group consisting of hepatocellular carcinoma, glioblastoma, lung cancer, breast cancer, head and neck cancer, prostate cancer, melanoma, and colorectal cancer.

114. The method of claim 112, wherein the cancer is multiple myeloma.

115. The method of any one of claims 1-114, wherein the cancer has become resistant to conventional treatments.

116 The method of any one of claims 1-115, wherein TG02 is the citrate salt of (16E)-14-methyl-20-oxa-5,7,14,26-tetraazatetracyclo[19.3.1.1(2,6).1(8,12)]heptacosal(25),2(26),3,5,8(27),9,11,16,21,23-decaene.

117. A kit comprising TG02 and an immune checkpoint inhibitor, an alkylating agent, a protein kinase inhibitor, a proteasome inhibitor, a topoisomerase II inhibitor, a platinum coordinating complex, or lenalidomide, and instructions for administering TG02 and the immune checkpoint inhibitor, alkylating agent, protein kinase inhibitor, proteasome inhibitor, topoisomerase II inhibitor, platinum coordinating complex, or lenalidomide, to a patient having cancer.