CLAIMS

1. A method of treating cancer in a subject, wherein the cancer is platinum resistant and the subject is BRCA negative, the method comprising administering one or both of a therapy that inhibits programmed death-1 protein (PD-1) signaling ("anti-PD-1 therapy") and a therapy that inhibits poly [ADP ribose] polymerase (PARP) ("anti-PARP therapy") to a subject so that the subject receives treatment with both therapies.

2. The method of claim 1, wherein the subject is gBRCA negative, tBRCA negative, or sBRCA negative.

3. The method of claim 1 or 2, wherein the subject is tBRCA negative.

4. The method of any one of the above claims, wherein the cancer is a gynecological cancer or a breast cancer.

5. The method of any one of the above claims, wherein the cancer is selected from the group consisting of ovarian cancer, cervical cancer, fallopian tube cancer, primary peritoneal cancer, and triple negative breast cancer (TNBC).

6. The method of any one of the above claims, wherein the cancer is PD-L1 negative.

7. The method of any one of the above claims, wherein the anti-PD-1 therapy comprises administration of an agent that inhibits PD-1 signaling.

8. The method of claim 7, wherein the agent that inhibits PD-1 signaling is a small molecule, a nucleic acid, a polypeptide (e.g., an antibody), a carbohydrate, a lipid, a metal, or a toxin.

9. The method of claim 7 or claim 8, wherein the agent that inhibits PD-1 signaling is an anti-PD-1 antibody agent.

10. The method of claim 9, wherein the anti-PD-1 antibody agent is an antibody selected from the group consisting of: BGB-A317, BI 754091, IBI308, INCSHR-1210, JNJ-63723283, JS-001, MEDI-0680, MGA-012, nivolumab, PDR001, pembrolizumab, PF-06801591, REGN-2810, TSR-042, and derivatives thereof.

11. The method of claim 9 or 10, wherein the anti-PD-1 antibody is pembrolizumab or a derivative thereof.

12. The method of any one of claims 1-8, wherein the anti-PD-1 therapy comprises administration of an anti-PD-L1/L2 agent.

13. The method of claim 12, wherein the anti-PD-L1/L2 agent is an anti-PD-L1 antibody.

14. The method of claim 13, wherein the anti-PD-L1 antibody agent is atezolizumab, avelumab, CX-072, durvalumab, FAZ053, LY3300054, PD-L1 millamolecule, or derivatives thereof.

15. The method of any one of the above claims, wherein the anti-PARP therapy comprises administration of an agent that inhibits PARP.

16. The method of claim 15, wherein the agent that inhibits PARP is a small molecule, a nucleic acid, a polypeptide (e.g., an antibody), a carbohydrate, a lipid, a metal, or a toxin.

17. The method of claim 15 or 16, wherein the agent that inhibits PARP is selected from the group consisting of: ABT-767, AZD 2461, BGB-290, BGP 15, CEP 8983, CEP 9722, DR 2313, E7016, E7449, fluzoparib (SHR-3162), IMP 4297, INO1001, JPI 289, JPI 547, monoclonal antibody B3-LysPE40 conjugate, MP 124, niraparib (ZEJULA) (MK-4827), NU-1025, NU-1064, NU-1076, NU1085, olaparib (AZD2281), ONO2231, PD 128763, R 503, R554, rucaparib (RUBRACA) (AG-014699, PF-01367338), SBP 101, SC 101914, Simmiparib, talazoparib (BMN-673), veliparib (ABT-888), WW 46, 2-(4-

~~(Trifluoromethyl)phenyl) 7,8-dihydro-5H-thiopyrano[4,3-d]pyrimidin-4-ol, and salts or derivatives thereof.~~

~~18. The method of any one of claims 15-17, wherein the agent that inhibits PARP is a small molecule.~~

~~19. The method of claim 18, wherein the agent that inhibits PARP is selected from the group consisting of: niraparib, olaparib, rucaparib, talazoparib, and veliparib, or salts or derivatives thereof.~~

~~20. The method of claim 19, wherein the agent that inhibits PARP is niraparib or a salt or derivative thereof.~~

~~21. The method of any one of the above claims, wherein the anti-PD-1 therapy and the anti-PARP therapy are administered according to a regimen that includes at least one 2-12 week treatment cycle.~~

~~22. The method of any one of the above claims, wherein the anti-PD-1 therapy and the anti-PARP therapy are administered in repeating cycles of 21 days.~~

~~23. The method of claim 21 or 22, wherein the anti-PD-1 therapy is administered on day one of cycle one.~~

~~24. The method of claim 23, wherein the anti-PD-1 therapy is administered on day one of a subsequent cycle.~~

~~25. The method of claim 23, wherein the anti-PD-1 therapy is administered between one to three days before or after day one of a subsequent cycle.~~

~~26. The method of any one of the above claims, wherein the anti-PD-1 therapy is administered at a dose that is equivalent to 200 mg pembrolizumab or 2 mg/kg of pembrolizumab.~~

~~27. The method of any one of the above claims, wherein the anti-PD-1 therapy is administered intravenously.~~

~~28. The method of any one of claims 21 and 23-25, wherein the anti-PD-1 therapy is administered at a dose that is equivalent to 3 mg/kg or 240 mg of nivolumab.~~

~~29. The method of claim 28, wherein the anti-PD-1 therapy is administered intravenously over about 60 minutes.~~

~~30. The method of any one of the above claims, wherein the anti-PARP therapy is administered at a dose that is less than the FDA-approved dose.~~

~~31. The method of any one of the above claims, wherein the anti-PARP therapy is administered at a dose that is equivalent to 200 mg of niraparib once a day.~~

~~32. The method of any one of the above claims, wherein the anti-PARP therapy is administered orally.~~

~~33. The method of any one of the above claims, wherein the treatment has been demonstrated to achieve clinical benefit in a percentage of patients.~~

~~34. The method of claim 33, wherein the clinical benefit is stable disease ("SD"), a partial response ("PR") and/or a complete response ("CR").~~

~~35. The method of any one of the above claims, wherein the cancer is platinum-refractory.~~

~~36. The method of any one of the above claims, wherein the subject has previously been treated with one or more different cancer treatment modalities.~~

~~37. The method of claim 36, wherein the subject has previously been treated with one or more of radiotherapy, chemotherapy or immunotherapy.~~

~~38. The method of claim 36 or 37, wherein the subject has been treated with one, two, three, four, or five lines of prior therapy.~~

~~39. The method of claim 38, wherein the subject has been treated with one or two lines of prior therapy.~~

~~40. The method of claim 38, wherein the subject has been treated with one line of prior therapy.~~

~~41. The method of claim 38, wherein the subject has been treated with two lines of prior therapy.~~

~~42. The method of any one of claims 38-41, wherein the prior therapy is cytotoxic therapy.~~

~~43. The method of claim 38, wherein the subject has been treated with at least two lines of prior platinum-based therapy, wherein the cancer progressed within six months of the last line of prior platinum-based therapy.~~

~~44. The method of claim 38, wherein the subject has been treated with at least two lines of prior platinum-based therapy, wherein the cancer progressed within thirty days of the last line of prior platinum-based therapy.~~

~~45. The method of any one of the above claims, wherein the method comprises administering both anti-PD-1 therapy and anti-PARP therapy to the subject.~~

~~46. A method of treating cancer, the method comprising:~~

~~administering one or both of an agent that inhibits programmed death-1 protein (PD-1) signaling and an agent that inhibits poly [ADP-ribose] polymerase (PARP) to a subject so that the subject receives treatment with both,~~

~~wherein the agent that inhibits PARP is administered in a dose that is less than the FDA-approved dose.~~

~~47. The method of claim 46, wherein the agent that inhibits PARP is administered in a dose that is equivalent to 200 mg of niraparib daily.~~

~~48. The method of claim 46 or 47, wherein the dose of the agent that inhibits PARP is administered orally.~~

~~49. The method of any one of claims 46-48, wherein the agent that inhibits PARP is a small molecule, a nucleic acid, a polypeptide (e.g., an antibody), a carbohydrate, a lipid, a metal, or a toxin.~~

~~50. The method of any one of claims 46-49, wherein the agent that inhibits PARP is selected from the group consisting of: ABT-767, AZD 2461, BGB-290, BGP-15, CEP 8983, CEP 9722, DR-2313, E7016, E7449, fluzoparib (SHR-3162), IMP 4297, INO1001, JPI-289, JPI-547, monoclonal antibody B3-LysPE40 conjugate, MP-124, niraparib (ZEJULA) (MK-4827), NU-1025, NU-1064, NU-1076, NU1085, olaparib (AZD2281), ONO2231, PD-128763, R-503, R554, rucaparib (RUBRACA) (AG-014699, PF-01367338), SBP-101, SC-101914, Simmiparib, talazoparib (BMN-673), veliparib (ABT-888), WW-46, 2-(4-(Trifluoromethyl)phenyl)-7,8-dihydro-5H-thiopyrano[4,3-d]pyrimidin-4-ol, and salts or derivatives thereof.~~

~~51. The method of any one of claims 46-50, wherein the agent that inhibits PARP is a small molecule.~~

~~52. The method of claim 51, wherein the agent that inhibits PARP is selected from the group consisting of: niraparib, olaparib, rucaparib, talazoparib, and veliparib, or salts or derivatives thereof.~~

~~53. The method of claim 52, wherein the agent that inhibits PARP is niraparib or a salt or derivative thereof.~~

~~54. The method of any one of claims 46-53, wherein the agent that inhibits PD-1 signaling is a small molecule, a nucleic acid, a polypeptide (e.g., an antibody), a carbohydrate, a lipid, a metal, or a toxin.~~

~~55. The method of any one of claims 46-54, wherein the agent that inhibits PD-1 signaling is an anti-PD-1 antibody agent.~~

~~56. The method of any one of claims 46-55, wherein the agent that inhibits PD-1 signaling is an anti-PD-1 antibody agent selected from the group consisting of: BGB-A317, BI 754091, IBI308, INCSHR-1210, JNJ-63723283, JS-001, MEDI-0680, MGA-012, nivolumab, PDR001, pembrolizumab, PF-06801591, REGN-2810, TSR-042, and derivatives thereof.~~

~~57. The method of claim 55 or 56, wherein the anti-PD-1 antibody is pembrolizumab or a derivative thereof.~~

~~58. The method of any one of claims 46-54, wherein the agent that inhibits PD-1 signaling is an anti-PD-L1/L2 agent.~~

~~59. The method of claim 58, wherein the anti-PD-L1/L2 agent is an anti-PD-L1 antibody agent.~~

~~60. The method of claim 58 or 59, wherein the agent that inhibits PD-1 signaling is an anti-PD-L1 antibody agent selected from the group consisting of: atezolizumab, avelumab,~~

~~CX-072, durvalumab, FAZ053, LY3300054, PD-L1 millamolecule, and derivatives thereof.~~

~~61. The method of any one of claims 46-60, wherein the agent that inhibits PD-1 signaling and the agent that inhibits PARP are administered according to a regimen that includes at least one 2-12 week treatment cycle.~~

~~62. The method of any one of claims 46-61, wherein the agent that inhibits PD-1 signaling and the agent that inhibits PARP are administered in repeating cycles of 21 days.~~

~~63. The method of claim 61 or 62, wherein the agent that inhibits PD-1 signaling is administered on day one of cycle one.~~

~~64. The method of claim 63, wherein the agent that inhibits PD-1 signaling is administered on day one of a subsequent cycle.~~

~~65. The method of claim 63, wherein the agent that inhibits PD-1 signaling is administered between one to three days before or after day one of a subsequent cycle.~~

~~66. The method of any one of claims 46-65, wherein the agent that inhibits PD-1 signaling is administered at a dose that is equivalent to 200 mg of pembrolizumab or 2 mg/kg of pembrolizumab.~~

~~67. The method of claim 66, wherein the agent that inhibits PD-1 signaling is administered intravenously over about 30 minutes.~~

~~68. The method of any one of claims 46-65, wherein the agent that inhibits PD-1 signaling is administered at a dose that is equivalent to 3 mg/kg or 240 mg of nivolumab.~~

~~69. The method of claim 67, wherein the agent that inhibits PD-1 signaling is administered intravenously over about 60 minutes.~~

~~70. The method of any one of claims 21-45 and 61-69, wherein the treatment cycle is at least 2 weeks, at least 3 weeks, or at least 4 weeks.~~

~~71. The method of any one of claims 21-45 and 61-70, wherein the regimen includes at least 3 treatment cycles.~~

~~72. The method of any one of claims 21-45 and 61-70, wherein the dose of the agent that inhibits PARP is increased if the subject's hemoglobin ≥ 9 g/dL, platelets ≥ 100,000/μL and neutrophils ≥ 1500/μL for all labs performed during one or more cycles.~~

~~73. The method of claim 72, wherein the dose of the agent that inhibits PARP is increased after two cycles.~~

~~74. The method of claim 72, wherein the agent that inhibits PARP is administered in an increased dose that is equivalent to 300 mg of niraparib.~~

~~75. The method of any one of claims 45-74, wherein the subject has a cancer selected from the group consisting of: endometrial cancer, breast cancer, ovarian cancer, cervical cancer, fallopian tube cancer, primary peritoneal cancer, colon cancer, squamous cell carcinoma of the anogenital region, melanoma, renal cell carcinoma, lung cancer, non-small cell lung cancer, squamous cell carcinoma of the lung, stomach cancer, bladder cancer, gall bladder cancer, liver cancer, thyroid cancer, laryngeal cancer, salivary gland cancer, esophageal cancer, head and neck cancer, squamous cell carcinoma of the head and neck, prostate cancer, pancreatic cancer, mesothelioma, sarcoma, and a hematological cancer.~~

~~76. The method of any one of claims 46-75, wherein the cancer is selected from the group consisting of ovarian cancer, cervical cancer, fallopian tube cancer, primary peritoneal cancer, and triple negative breast cancer (TNBC).~~

~~77. The method of any one of claims 46-76, wherein the cancer is platinum resistant.~~

~~78. The method of any one of claims 46-76, wherein the cancer is platinum refractory.~~

~~79. The method of any one of claims 46-78, wherein the subject is BRCA negative.~~

~~80. The method of claim 79, wherein the subject is gBRCA negative, tBRCA negative, or sBRCA negative.~~

~~81. The method of claim 79 or 80, wherein the subject is tBRCA negative.~~

~~82. The method of any one of claims 46-81, wherein the cancer is PD-L1 negative.~~

~~83. The method of claim 82, wherein the subject is BRCA negative and the cancer is PD-L1 negative.~~

~~84. The method of any one of claims 46-83, wherein the subject has previously been treated with one or more different cancer treatment modalities.~~

~~85. The method of claim 84, wherein the subject has previously been treated with one or more of radiotherapy, chemotherapy or immunotherapy.~~

~~86. The method of claim 84 or 85, wherein the subject has been treated with one, two, three, four, or five lines of prior therapy.~~

~~87. The method of claim 86, wherein the subject has been treated with one or two lines of prior therapy.~~

~~88. The method of claim 86, wherein the subject has been treated with one line of prior therapy.~~

89. The method of claim 86, wherein the subject has been treated with two lines of prior therapy.

90. The method of any one of claims 86-89, wherein the prior therapy is cytotoxic therapy.

91. The method of claim 86, wherein the subject has been treated with at least two lines of prior platinum-based therapy, wherein the cancer progressed within six months of the last line of prior platinum-based therapy.

92. The method of claim 86, wherein the subject has been treated with at least two lines of prior platinum-based therapy, wherein the cancer progressed within thirty days of the last line of prior platinum-based therapy.

93. The method of any one of claims 46-92, wherein the method comprises administering both an agent that inhibits PD-1 signaling and an agent that inhibits PARP to the subject.

94. A method of treating a recurrent cancer, the method comprising:

administering one or both of a programmed death-1 protein (PD-1) antibody agent and niraparib to a subject so that the subject receives treatment with both,

wherein the cancer is a gynecological cancer or a breast cancer and wherein the treatment has been demonstrated to achieve clinical benefit in a percentage of patients, wherein the clinical benefit is or comprises stable disease ("SD"), a partial response ("PR") and/or a complete response ("CR").

95. The method of claim 94, wherein the cancer is selected from the group consisting of ovarian cancer, cervical cancer, fallopian tube cancer, primary peritoneal cancer, and triple negative breast cancer (TNBC).

96. The method of claim 94 or 95, wherein the cancer is platinum resistant.

97. The method of claim 94 or 95, wherein the cancer is platinum refractory.

~~98. The method of any one of claims 94-97, wherein the subject is BRCA negative.~~

~~99. The method of claim 98, wherein the subject is gBRCA negative, tBRCA negative, or sBRCA negative.~~

~~100. The method of claim 98 or 99, wherein the subject is tBRCA negative.~~

~~101. The method of any one of claims 94-100, wherein the cancer is PD-L1 negative.~~

~~102. The method of claim 101, wherein the subject is BRCA negative and the cancer is PD-L1 negative.~~

~~103. The method of any one of claims 94-102, wherein the step of administering comprises administering a composition that delivers the PD-1 antibody agent to a subject who has received or will receive niraparib.~~

~~104. The method of claim 103, wherein the step of administering comprises administering a composition that delivers the niraparib to a subject who has received or will receive the PD-1 antibody agent.~~

~~105. The method of any one of claims 94-104, wherein the percentage is at least 10%.~~

~~106. The method of claim 105, wherein the clinical benefit is or comprises SD and at least 10% of patients achieve the SD.~~

~~107. The method of claim 105, wherein the clinical benefit is or comprises PR at least 10% of patients achieve at least the PR.~~

~~108. The method of claim 105, wherein the clinical benefit is or comprises CR at least 10% of patients achieve at least the CR.~~

~~109. The method of any one of claims 94-104, wherein the percentage is at least 20%.~~

~~110. The method of claim 109, wherein the clinical benefit is or comprises SD and at least 20% of patients achieve the SD.~~

~~111. The method of claim 109, wherein at least 20% of patients achieve at least the PR.~~

~~112. The method of any one of claims 94-111, wherein the clinical benefit is determined in accordance with Response Evaluation Criteria in Solid Tumors (RECIST).~~

~~113. The method of any one of claims 94-112, wherein the method comprises administering both a PD-1 antibody agent and niraparib to the subject.~~

~~114. A method of treating a recurrent gynecological cancer or breast cancer, the method comprising: administering one or both of a programmed death-1 protein (PD-1) antibody agent and niraparib to a subject so that the subject receives treatment with both, wherein the treatment has been demonstrated to achieve overall response rate of at least 30%.~~

~~115. The method of claim 114, wherein the response is assessed as at least a SD.~~

~~116. The method of claim 114, wherein the response is assessed as a decrease in serum CA-125 concentration.~~

~~117. The method of any one of claims 114-116, wherein the recurrent cancer is selected from the group consisting of ovarian cancer, fallopian tube cancer, primary peritoneal cancer and triple negative breast cancer (TNBC).~~

~~118. The method of claim 117, wherein the recurrent cancer is high grade serous or a recurrent cancer with high grade predominantly serous histology.~~

~~119. The method of claim 117 or 118, wherein the recurrent cancer is platinum resistant at the commencement of treatment.~~

~~120. The method of claim 117 or 118, wherein the recurrent cancer is platinum refractory at the commencement of treatment.~~

~~121. The method of any one of claims claim 117-120, wherein the subject previously experienced a response to platinum-based therapy that lasted at least 6 months.~~

~~122. The method of claim 117, wherein the recurrent cancer is ovarian cancer.~~

~~123. The method of claim 122, wherein the ovarian cancer is high grade serous or a ovarian cancer with high grade predominantly serous histology.~~

~~124. The method of claim 122 or 123, wherein the ovarian cancer is platinum resistant at the commencement of treatment.~~

~~125. The method of claim 122 or 123, wherein the ovarian cancer is platinum refractory at the commencement of treatment.~~

~~126. The method of claim 117, wherein the recurrent cancer is triple negative breast cancer.~~

~~127. The method of any one of claims 46-126, wherein the subject has at least one mutation in BRCA1 and/or BRCA2.~~

~~128. The method of any one of claims 46-126, wherein the subject is characterized by an absence of a mutation in BRCA1 and BRCA2.~~

~~129. The method of any one of claims 114-126, wherein the subject is BRCA negative.~~

~~130. The method of claim 129, wherein the subject is gBRCA negative, tBRCA negative, or sBRCA negative.~~

~~131. The method of claim 129 or 130, wherein the subject is tBRCA negative.~~

~~132. The method of any one of claims 114-131, wherein the cancer is PD-L1 negative.~~

~~133. The method of claim 132, wherein the subject is BRCA negative and the cancer is PD-L1 negative.~~

~~134. The method of any one of claims 114-133, wherein the method comprises administering both a PD-1 antibody agent and niraparib to the subject.~~

~~135. A method of treating cancer, the method comprising:~~

~~administering a therapeutically effective amount of an agent that inhibits poly [ADP-ribose] polymerase (PARP) and an agent that inhibits programmed death-1 protein (PD-1) signaling to a subject,~~

~~wherein the subject is BRCA negative and the cancer is PD-L1 negative.~~

~~136. A method of treating cancer, the method comprising:~~

~~administering a therapeutically effective amount of an agent that inhibits poly [ADP-ribose] polymerase (PARP) and an agent that inhibits programmed death-1 protein (PD-1) signaling to a subject,~~

~~wherein the agents are administered to the subject independent of DNA repair status, optionally independent of BRCA status.~~

~~137. A method of treating cancer, the method comprising:~~

~~administering a therapeutically effective amount of an agent that inhibits poly [ADP-ribose] polymerase (PARP) and an agent that inhibits programmed death-1 protein (PD-1) signaling to a subject,~~

~~wherein administration of the agents to the subject is commenced prior to determining the DNA repair status of the subject or the BRCA status of the subject.~~

138. A method of treating cancer, the method comprising:

administering a therapeutically effective amount of an agent that inhibits poly [ADP-ribose] polymerase (PARP) and an agent that inhibits programmed death-1 protein (PD-1) signaling to a subject,

wherein administration of the agents to the subject is commenced in the absence of determining the DNA repair status of the subject or the BRCA status of the subject.

139. The method of any one of claims 135-138, wherein the subject is gBRCA negative, tBRCA negative, or sBRCA negative.

140. The method of any one of claims 135-139, wherein the subject is tBRCA negative.

141. The method of any one of claims 135-140, wherein the dose of the agent that inhibits PARP is administered orally.

142. The method of any one of claims 135-141, wherein the agent that inhibits PARP is a small molecule, a nucleic acid, a polypeptide (e.g., an antibody), a carbohydrate, a lipid, a metal, or a toxin.

143. The method of any one of claims 135-142, wherein the agent that inhibits PARP is selected from the group consisting of: ABT-767, AZD 2461, BGB-290, BGP-15, CEP 8983, CEP 9722, DR 2313, E7016, E7449, fluzoparib (SHR 3162), IMP 4297, INO1001, JPI 289, JPI 547, monoclonal antibody B3-LysPE40 conjugate, MP 124, niraparib (ZEJULA) (MK-4827), NU 1025, NU 1064, NU 1076, NU1085, olaparib (AZD2281), ONO2231, PD 128763, R 503, R554, rucaparib (RUBRACA) (AG 014699, PF-01367338), SBP 101, SC 101914, Simmiparib, talazoparib (BMN 673), veliparib (ABT-888), WW 46, 2 (4 (Trifluoromethyl)phenyl) 7,8-dihydro-5H thiopyrano[4,3-d]pyrimidin-4-ol, and salts or derivatives thereof.

144. The method of any one of claims 135-143, wherein the agent that inhibits PARP is a small molecule.

~~145. The method of claim 144, wherein the agent that inhibits PARP is selected from the group consisting of: niraparib, olaparib, rucaparib, talazoparib, and veliparib, or salts or derivatives thereof.~~

~~146. The method of claim 145, wherein the agent that inhibits PARP is niraparib or a salt or derivative thereof.~~

~~147. The method of claim 146, wherein the niraparib or salt or derivative thereof is administered in a dose that is equivalent to 200 mg or 300 mg of niraparib daily.~~

~~148. The method of any one of claims135-147, wherein the agent that inhibits PD-1 signaling is a small molecule, a nucleic acid, a polypeptide (e.g., an antibody), a carbohydrate, a lipid, a metal, or a toxin.~~

~~149. The method of any one of claims 135-148, wherein the agent that inhibits PD-1 signaling is an anti-PD-1 antibody agent.~~

~~150. The method of any one of claims 135-149, wherein the agent that inhibits PD-1 signaling is an anti-PD-1 antibody agent selected from the group consisting of: BGB-A317, BI 754091, IBI308, INCSHR-1210, JNJ-63723283, JS-001, MEDI-0680, MGA-012, nivolumab, PDR001, pembrolizumab, PF-06801591, REGN-2810, TSR-042, and derivatives thereof.~~

~~151. The method of claim 149 or 150, wherein the anti-PD-1 antibody agent is pembrolizumab or a derivative thereof.~~

~~152. The method of any one of claims 135-148, wherein the agent that inhibits PD-1 signaling is an anti-PD-L1/L2 agent.~~

~~153. The method of claim 152, wherein the anti-PD-L1/L2 agent is an anti-PD-L1 antibody agent.~~

~~154. The method of claim 152 or 153, wherein the agent that inhibits PD-1 signaling is an anti-PD-L1 antibody agent selected from the group consisting of: atezolizumab, avelumab, CX-072, durvalumab, FAZ053, LY3300054, PD-L1 millamolecule, and derivatives thereof.~~

~~155. The method of any one of claims 135-154, wherein the agent that inhibits PD-1 signaling and the agent that inhibits PARP are administered according to a regimen that includes at least one 2-12 week treatment cycle.~~

~~156. The method of any one of claims 135-155, wherein the agent that inhibits PD-1 signaling and the agent that inhibits PARP are administered in repeating cycles of 21 days.~~

~~157. The method of claim 155 or 156, wherein the agent that inhibits PD-1 signaling is administered on day one of cycle one.~~

~~158. The method of claim 157, wherein the agent that inhibits PD-1 signaling is administered on day one of a subsequent cycle.~~

~~159. The method of claim 157, wherein the agent that inhibits PD-1 signaling is administered between one to three days before or after day one of a subsequent cycle.~~

~~160. The method of any one of claims 135-159, wherein the agent that inhibits PD-1 signaling is administered at a dose that is equivalent to 200 mg of pembrolizumab or 2 mg/kg of pembrolizumab.~~

~~161. The method of claim 160, wherein the agent that inhibits PD-1 signaling is administered intravenously over about 30 minutes.~~

~~162. The method of any one of claims 135-159, wherein the agent that inhibits PD-1 signaling is administered at a dose that is equivalent to 3 mg/kg or 240 mg of nivolumab.~~

~~163. The method of claim 161, wherein the agent that inhibits PD-1 signaling is administered intravenously over about 60 minutes.~~

~~164. The method of any one of claims 155-163, wherein the treatment cycle is at least 2 weeks, at least 3 weeks, or at least 4 weeks.~~

~~165. The method of any one of claims 155-164, wherein the regimen includes at least 3 treatment cycles.~~

~~166. The method of any one of claims 155-165, wherein the dose of the agent that inhibits PARP is increased if the subject's hemoglobin ≥ 9 g/dL, platelets ≥ 100,000/μL and neutrophils ≥ 1500/μL for all labs performed during one or more cycles.~~

~~167. The method of claim 166, wherein the dose of the agent that inhibits PARP is increased after two cycles.~~

~~168. The method of claim 166, wherein the agent that inhibits PARP is administered in an increased dose that is equivalent to 300 mg of niraparib.~~

~~169. The method of any one of claims 135-168, wherein the cancer is selected from: endometrial cancer, breast cancer, ovarian cancer, cervical cancer, fallopian tube cancer, primary peritoneal cancer, colon cancer, squamous cell carcinoma of the anogenital region, melanoma, renal cell carcinoma, lung cancer, non-small cell lung cancer, squamous cell carcinoma of the lung, stomach cancer, bladder cancer, gall bladder cancer, liver cancer, thyroid cancer, laryngeal cancer, salivary gland cancer, esophageal cancer, squamous cell carcinoma of the head and neck, prostate cancer, pancreatic cancer, mesothelioma, sarcoma, or a hematological cancer.~~

~~170. The method of any one of claims 135-169, wherein the cancer is selected from the group consisting of ovarian cancer, cervical cancer, fallopian tube cancer, primary peritoneal cancer, and triple negative breast cancer (TNBC).~~

~~171. The method of any one of claims 135-170, wherein the cancer is recurrent cancer.~~

~~172. The method of any one of claims 135-171, wherein the cancer is platinum resistant.~~

~~173. The method of any one of claims 135-171, wherein the cancer is platinum refractory.~~

~~174. The method of any one of claims 135-173, wherein the subject has previously been treated with one or more different cancer treatment modalities.~~

~~175. The method of claim 174, wherein the subject has previously been treated with one or more of radiotherapy, chemotherapy or immunotherapy.~~

~~176. The method of claim 174 or 175, wherein the subject has been treated with one, two, three, four, or five lines of prior therapy.~~

~~177. The method of claim 176, wherein the subject has been treated with one or two lines of prior therapy.~~

~~178. The method of claim 176, wherein the subject has been treated with one line of prior therapy.~~

~~179. The method of claim 176, wherein the subject has been treated with two lines of prior therapy.~~

~~180. The method of any one of claims 176-179, wherein the prior therapy is cytotoxic therapy.~~

~~181. The method of claim 176, wherein the subject has been treated with at least two lines of prior platinum-based therapy, wherein the cancer progressed within six months of the last line of prior platinum-based therapy.~~

~~182. The method of claim 176, wherein the subject has been treated with at least two lines of prior platinum-based therapy, wherein the cancer progressed within thirty days of the last line of prior platinum-based therapy.~~

~~183. The method of any one of the above claims, wherein the subject is a human.~~

~~184. The method of any one of claims 1-3, 6-74, 77-93, 135-168, and 171-183, wherein the cancer is:~~

~~i) a cancer associated with a high tumor mutation burden (TMB);~~

~~ii) a cancer that is microsatellite stable (MSS),~~

~~iii) a cancer that is characterized by microsatellite instability,~~

~~iv) a cancer that has a high microsatellite instability status (MSI-H),~~

~~v) a cancer that has a low microsatellite instability status (MSI-L),~~

~~vi) a cancer associated with high TMB and MSI-H,~~

~~vii) a cancer associated with high TMB and MSI-L or MSS,~~

~~viii) a cancer that has a defective DNA mismatch repair system,~~

~~ix) a cancer that has a defect in a DNA mismatch repair gene,~~

~~x) a hypermutated cancer,~~

~~xi) a cancer comprising a mutation in polymerase delta (POLD)~~

~~xii) a cancer comprising a mutation in polymerase epsilon (POLE),~~

xiii) a cancer that has homologous recombination repair deficiency/homologous repair deficiency ("HRD") or is characterized by a homologous recombination repair (HRR) gene mutation or deletion;

xiv) adenocarcinoma, endometrial cancer, breast cancer, ovarian cancer, cervical cancer, fallopian tube cancer, testicular cancer, primary peritoneal cancer, colon cancer, colorectal cancer, small intestine cancer, squamous cell carcinoma of the anus, squamous cell carcinoma of the penis, squamous cell carcinoma of the cervix, squamous cell carcinoma of the vagina, squamous cell carcinoma of the vulva, soft tissue sarcoma, melanoma, renal cell carcinoma, lung cancer, non-small cell lung cancer, adenocarcinoma of the lung, squamous cell carcinoma of the lung, stomach cancer, bladder cancer, gall bladder cancer, liver cancer, thyroid cancer, laryngeal cancer, salivary gland cancer, esophageal cancer, head and neck cancer, squamous cell carcinoma of the head and neck, prostate cancer, pancreatic cancer, mesothelioma, Merkel cell carcinoma, sarcoma, glioblastoma, a hematological cancer, multiple myeloma, B-cell lymphoma, T-cell lymphoma, Hodgkin's lymphoma/primary mediastinal B-cell lymphoma, chronic myelogenous leukemia, acute myeloid leukemia, acute lymphoblastic leukemia, non-Hodgkin's lymphoma, neuroblastoma, a CNS tumor, diffuse intrinsic pontine glioma (DIPG), Ewing's sarcoma, embryonal rhabdomyosarcoma, osteosarcoma, or Wilms tumor; or

xv) a cancer of xiv), wherein the cancer is MSS or MSI-L, is characterized by microsatellite instability, is MSI-H, has high TMB, has high TMB and is MSS or MSI-L, has high TMB and is MSI-H, has a defective DNA mismatch repair system, has a defect in a DNA mismatch repair gene, is a hypermutated cancer, is an HRD or HRR cancer, comprises a mutation in polymerase delta (POLD), or comprises a mutation in polymerase epsilon (POLE).

185. The method of claim 184, wherein the cancer is melanoma, renal cell carcinoma, lung cancer, bladder cancer, breast cancer, cervical cancer, colon cancer, gall bladder cancer, laryngeal cancer, liver cancer, thyroid cancer, stomach cancer, salivary gland cancer, prostate cancer, pancreatic cancer, endometrial cancer, ovarian cancer, or Merkel cell carcinoma.

186. The method of claim 184, wherein the cancer is non-small cell lung cancer, endometrial cancer, renal cell carcinoma, cervical cancer, stomach cancer, colorectal cancer, or triple negative breast cancer (TNBC).

~~187. The method of claim 184, wherein the cancer is a cancer that has homologous recombination repair deficiency/homologous repair deficiency ("HRD") or is characterized by a homologous recombination repair (HRR) gene mutation or deletion.~~

~~188. The method of claim 184, wherein the cancer is endometrial cancer, optionally MSI-H or MSS/MSI-L endometrial cancer.~~

~~189. The method of claim 184, wherein the cancer is a MSI-H cancer comprising a mutation in POLE or POLD, optionally a MSI-H non-endometrial cancer comprising a mutation in POLE or POLD.~~

~~190. The method of claim 184, wherein the cancer is breast cancer, optionally triple negative breast cancer (TNBC).~~

~~191. The method of claim 184, wherein the cancer is ovarian cancer, optionally epithelial ovarian cancer.~~

~~192. The method of claim 184, wherein the cancer is lung cancer, optionally non-small cell lung cancer.~~

~~193. The method of claim 184, wherein the cancer is melanoma.~~

~~194. The method of claim 184, wherein the cancer is colorectal cancer.~~

~~195. The method of claim 184, wherein the cancer is squamous cell carcinoma of the anus, squamous cell carcinoma of the penis, squamous cell carcinoma of the cervix, squamous cell carcinoma of the vagina, or squamous cell carcinoma of the vulva.~~

~~196. The method of claim 184, wherein the cancer is acute myeloid leukemia.~~

~~197. The method of claim 184, wherein the cancer is acute lymphoblastic leukemia.~~

~~198. The method of claim 184, wherein the cancer is non-Hodgkin's lymphoma.~~

~~199. The method of claim 184, wherein the cancer is Hodgkin's lymphoma.~~

~~200. The method of claim 184, wherein the cancer is neuroblastoma.~~

~~201. The method of claim 184, wherein the cancer is a CNS tumor.~~

~~202. The method of claim 184, wherein the cancer is diffuse intrinsic pontine glioma (DIPG).~~

~~203. The method of claim 184, wherein the cancer is Ewing's sarcoma.~~

~~204. The method of claim 184, wherein the cancer is embryonal rhabdomyosarcoma.~~

~~205. The method of claim 184, wherein the cancer is osteosarcoma.~~

~~206. The method of claim 184, wherein the cancer is Wilms tumor.~~

~~207. The method of claim 184, wherein the cancer is soft tissue sarcoma.~~

~~208. The method of claim 184, wherein the cancer is leiomyosarcoma.~~

1. An invention not claimed in any divisional application.