

Claims

WHAT IS CLAIMED IS:

1. A pharmaceutical composition, comprising Plinabulin and one or more immune checkpoint inhibitor, wherein the immune checkpoint inhibitor is an antibody of PD-1, PD-L1, or CTLA-4.
2. The composition of claim 1, comprising a first immune checkpoint inhibitor and a second immune checkpoint inhibitor, wherein the first immune checkpoint inhibitor is different from the second immune checkpoint inhibitor.
3. The composition of claim 2, wherein the first and the second immune checkpoint inhibitor is independently an antibody of PD-1, PD-L1, or CTLA-4.
4. The composition of claim 3, wherein the first immune checkpoint inhibitor is a PD-1 antibody, and the second immune checkpoint inhibitor is a CTLA-4 antibody.
5. The composition of claim 3, wherein the first immune checkpoint inhibitor is a PD-L1 antibody, and the second immune checkpoint inhibitor is a CTLA-4 antibody.
6. The composition of claim 1, wherein the immune checkpoint inhibitor is a PD-1 antibody.
7. The composition of claim 1, wherein the immune checkpoint inhibitor is a PD-L1 antibody.
8. The composition of claim 1, wherein the immune checkpoint inhibitor is a CTLA-4 antibody.
9. The composition of claim 1, wherein the antibody is α -CTLA4-PE-Cy7, or α -PD1-APC.
10. The composition of any one of claims 1 to 9, further comprising one or more pharmaceutically acceptable excipients.
11. The composition of any one of claims 1 to 10, further comprising one or more additional chemotherapeutic agent.
12. The composition of any one of claims 1 to 11, wherein the immune checkpoint inhibitor is nivolumab, pembrolizumab, pidilizumab, ipilimumab, BMS 936559, atezolizumab, durvalimumab, or any combinations thereof.
13. Use of the pharmaceutical composition of any one of claims 1 to 12 for the manufacture of a medicament in treating cancer.

14. Use of Plinabulin for the manufacture of a medicament in treating cancer, wherein Plinabulin is used in combination with one or more immune checkpoint inhibitor, wherein the immune checkpoint inhibitor is an antibody of PD-1, PD-L1, or CTLA-4.
15. The use of plinabulin according to claim 14, wherein plinabulin is used in further combination with one or more additional chemotherapeutic agent.
16. The use of plinabulin according to any one of claims 13 to 15, wherein the cancer comprises cancer cells expressing a binding ligand of PD-1.
17. The use of plinabulin according to claim 16, wherein the binding ligand of PD-1 is PD-L1.
18. The use of plinabulin according to any one of claims 13 to 17, wherein the cancer is head and neck cancer, lung cancer, stomach cancer, colon cancer, pancreatic cancer, prostate cancer, breast cancer, kidney cancer, bladder cancer, ovary cancer, cervical cancer, melanoma, glioblastoma, myeloma, lymphoma, or leukemia.
19. The use of plinabulin according to any one of claims 13 to 17, wherein the cancer is renal cell carcinoma, malignant melanoma, non-small cell lung cancer (NSCLC), ovarian cancer, Hodgkin's lymphoma or squamous cell carcinoma.
20. The use of plinabulin according to any one of claims 13 to 15, wherein the cancer comprises cancer cells expressing a binding ligand of CTLA-4.
21. The use of plinabulin according to claim 20, wherein the binding ligand of CTLA-4 is B7.1 or B7.2.
22. The use of plinabulin according to claim 14, wherein the immune checkpoint inhibitor is a PD-1 antibody.
23. The use of plinabulin according to claim 14, wherein the immune checkpoint inhibitor is a PD-L1 antibody.
24. The use of plinabulin according to claim 14, wherein the immune checkpoint inhibitor is a CTLA antibody.
25. The use of plinabulin according to claim any one of claims 14-21, comprising a first immune checkpoint inhibitor and a second immune checkpoint inhibitor, wherein the first immune checkpoint inhibitor is different from the second immune checkpoint inhibitor.
26. The use of plinabulin according to claim 25, wherein the first and the second immune checkpoint inhibitor is independently an antibody of PD-1, PD-L1, or CTLA-4,.

27. The use of plinabulin according to claim 26, wherein the first immune checkpoint inhibitor is a PD-1 antibody, and the second immune checkpoint inhibitor is a CTLA-4 antibody.

28. The use of plinabulin according to claim 26, wherein the first immune checkpoint inhibitor is a PD-L1 antibody, and the second immune checkpoint inhibitor is a CTLA-4 antibody.

29. The use of plinabulin according to claim 25, wherein the antibody is α -CTLA4-PE-Cy7 or α -PD1-APC.

30. The use of plinabulin according to any one of claims 14 to 21, wherein the immune checkpoint inhibitor is nivolumab, pembrolizumab, pidilizumab, ipilimumab, BMS 936559, atezolizumab, durvalimumab, or any combinations thereof.

31. The use of plinabulin according to claim 13 or 14, wherein the cancer is selected from breast cancer, colon cancer, rectal cancer, lung cancer, prostate cancer, melanoma, leukemia, ovarian cancer, gastric cancer, renal cell carcinoma, liver cancer, pancreatic cancer, lymphomas and myeloma.

32. The use of plinabulin according to claim 13 or 14, wherein the cancer is a solid tumor or hematological cancer.

33. The use of plinabulin according to claim 13 or 14, wherein the cancer does not have any cells expressing PD-1, PD-L1, or PD-L2.