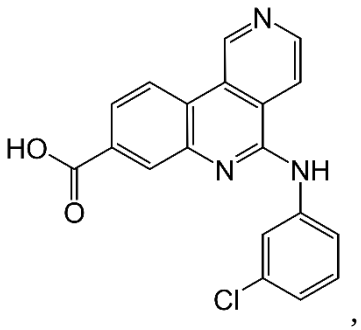
Claims

What is claimed is:

1. Use of a combination of a CK2 inhibitor and an immune checkpoint inhibitor in the manufacture of a medicament for treating a cancer or refractory cancer and/or inhibiting cancer metastasis, recurrence or progression in a subject or increasing the likelihood of survival over a relevant period in a subject diagnosed with a cancer, wherein:

the CK2 inhibitor is CX-4945 or a pharmaceutically acceptable salt or ester thereof, the CX-4945 having the following structure:



,

and

the immune checkpoint inhibitor is an anti-CTLA-4 antibody.

2. The use of Claim 1, wherein the combination is to be administered to increase the likelihood of survival over a relevant period in the subject.

3. The use of Claim 1, wherein the combination is to be administered to increase tumor-specific T cells in the tumor microenvironment in a subject.

4. The use of Claim 1, wherein the combination of the CK2 inhibitor and the immune checkpoint inhibitor are to be administered concurrently, sequentially, intermittently or periodically.

5. The use of Claim 1, wherein the combination is to be administered for at least one administration cycle, wherein the cycle is a period of eight weeks or less.

6. The use of Claim 1, wherein the combination is to be administered to result in immunological memory to said cancer.

7. The use of Claim 1, wherein the CK2 inhibitor and the immune checkpoint inhibitor are in synergistically effective amounts.

8. The use of Claim 5, wherein the cycle is a period of four weeks.

9. The use of Claim 5, wherein the administration cycle comprises administering to the subject the CK2 inhibitor in an amount and regimen sufficient to achieve a response (partial or complete response), and then administering an amount of the immune checkpoint inhibitor to the subject.

10. The use of Claim 5, wherein the administration cycle comprises administering the CK2 inhibitor in every day.

11. The use of Claim 10, wherein the administration cycle comprises administrating the immune checkpoint inhibitor twice a week.

12. The use of Claim 5, wherein the CK2 inhibitor is to be administered in a daily dose in the range from 25 mg per kg of subject weight (25 mg/kg) to 2000 mg/kg.

13. The use of Claim 12, wherein the daily dose is in the range of 50 mg/kg to 200 mg/kg.

14. The use of Claim 5, wherein the immune checkpoint inhibitor is to be administered in a dose in the range from 1 mg per kg of subject weight (1 mg/kg) to 20 mg/kg.

15. The use of Claim 5, wherein the dose of the immune checkpoint inhibitor is in the range of 8 mg/kg to 15 mg/kg.

16. The use of Claim 1, wherein the cancer is glioblastoma, skin cancer (such as melanoma and basal cell carcinoma), liver cancer (such as hepatocellular carcinoma), colorectal carcinoma, glioblastoma, gastric cancer, colorectal cancer, esophageal cancer, lung cancer (such as non-small cell lung cancer (NSCLC) and small cell lung cancer), pancreatic cancer, renal cell carcinoma, benign prostate hyperplasia, prostate cancer, ovarian cancer, melanoma, breast cancer, chronic lymphocytic leukemia (CLL), Merkel cell carcinoma, Non-Hodgkin lymphoma, acute myeloid leukemia (AML), gallbladder cancer, cholangiocarcinoma, urinary bladder cancer, or uterine cancer.

17. The use of Claim 1, wherein the immune checkpoint inhibitor is ticilimumab or ipilimumab.

18. The use of Claim 1, wherein the cancer is colorectal carcinoma, colorectal cancer, colon carcinoma, colon cancer, breast cancer or breast carcinoma.