Claims

What is claimed is:

1. An anti-cancer combination therapy comprising at least one dendritic cell pulsed with an oncodriver and at least one immunoregulatory molecule inhibitor; wherein the immunoregulatory molecule comprises Semaphorin 4D or VEGF.

2. The anti-cancer combination therapy of claim 1, wherein the oncodriver is human epidermal growth factor receptor (HER) HER2.

3. The anti-cancer combination therapy of claim 1 or claim 2, wherein the oncodriver pulsed dendritic cell is activated with IL-12 prior to administration.

4. The anti-cancer combination therapy of any one of claims 1 to 3, wherein the immunoregulatory molecule inhibitor comprises an antagonist antibody that specifically binds to SEMA4D or VEGF.

5. The anti-cancer combination therapy of claim 4, wherein the antagonist antibody that specifically binds to SEMA4D comprises pepinemab.

6. The anti-cancer combination therapy of any one of claims 1-5, wherein the at least one immunoregulatory inhibitor is formulated for systemic administration.

7. The anti-cancer combination therapy of any one of claims 1-6, wherein the at least one oncodriver pulsed dendritic cell is formulated for intratumoral administration.

8. The anti-cancer combination therapy of any one of claims 1-7, wherein the at least one dendritic cell pulsed with an oncodriver is obtained by removing dendritic cells from a subject to be treated with the anti-cancer combination therapy, and pulsed with the oncodriver *ex vivo*.

9. The anti-cancer combination therapy of any one of claims 1-8, wherein the cancer is breast cancer, melanoma, colorectal cancer, pancreatic cancer, prostate cancer, bladder cancer, ovarian cancer, stomach cancer, any combination thereof, or any metastasis thereof.

10. At least one dendritic cell pulsed with an oncodriver for use in the treatment of cancer in a subject, in combination with at least one immunoregulatory molecule inhibitor; wherein the immunoregulatory molecule comprises Semaphorin 4D or VEGF.

11. The at least one dendritic cell pulsed with an oncodriver for the use of claim 10, wherein the oncodriver is human epidermal growth factor receptor (HER) HER2.

12. The at least one dendritic cell pulsed with an oncodriver for the use of claim 10 or 11, wherein the oncodriver pulsed dendritic cell is activated with IL-12 prior to administration.

13. The at least one dendritic cell pulsed with an oncodriver for the use of any one co claims10 – 12, wherein the immunoregulatory molecule inhibitor comprises an antagonist antibody that specifically binds to SEMA4D or VEGF.

14. The at least one dendritic cell pulsed with an oncodriver for the use of claim 13, wherein the antagonist antibody that specifically binds to SEMA4D comprises pepinemab.

15. The at least one dendritic cell pulsed with an oncodriver for the use of any one of claims 10-14, wherein the at least one immunoregulatory inhibitor is formulated for systemic administration.

16. The at least one dendritic cell pulsed with an oncodriver for the use of any one of claims 10-15, wherein the at least one oncodriver pulsed dendritic cell is formulated for intratumoral administration.

17. The at least one dendritic cell pulsed with an oncodriver for the use of any one of claims 10-16 wherein the at least one dendritic cell pulsed with an oncodriver is obtained by removing dendritic cells from a subject to be treated with the anti-cancer combination therapy, and pulsed with the oncodriver *ex vivo*.

18. The at least one dendritic cell pulsed with an oncodriver for the use of any one of claims 10-17 wherein the cancer is breast cancer, melanoma, colorectal cancer, pancreatic cancer, prostate cancer, bladder cancer, ovarian cancer, stomach cancer, any combination thereof, or any metastasis thereof.