Claims

1. An isolated antibody or antibody fragment thereof comprising an antigen binding region that binds to a V-domain Ig Suppressor of T cell Activation (VISTA), wherein the antibody comprises an antibody VH domain comprising a VH CDRI having the amino acid sequence of SEQ ID NO:25, a VH CDR2 having the amino acid sequence of SEQ ID NO:26 and a VH CDR3 having the amino acid sequence of SEQ ID NO:27, and which further comprises an antibody VL domain comprising a VL CDR1 having the amino acid sequence of SEQ ID NO:28, a VL CDR2 having the amino acid sequence of SEQ ID NO:29 and a VL CDR3 having the amino acid sequence of SEQ ID NO:30.
2. The antibody or antibody fragment of Claim 1, comprising one or more humanized or human framework regions.
3. The antibody or antibody fragment of Claim 2, wherein the antibody VH domain comprises SEQ ID NO:37.
4. The antibody of Claim 2 or 3, wherein the antibody VL domain comprises SEQ ID NO:44.
5. The antibody or antibody fragment of any one of Claims 1 to 4, wherein the antibody comprises a heavy chain constant region.
6. The antibody or antibody fragment of Claim 5, wherein the heavy chain constant region is a human heavy chain constant region.
7. The antibody or antibody fragment of Claim 5 or 6, wherein the heavy chain constant region is an IgG1 heavy chain constant region.
8. The antibody or antibody fragment of Claim 7, wherein the IgG1 heavy chain constant region comprises the amino acid sequence of the IgG1 heavy chain constant region present in SEQ ID NO:61.
9. The antibody or antibody fragment of Claim 7, wherein the IgG1 heavy chain constant region has been modified to enhance protease resistance of the antibody.
10. The antibody or antibody fragment of Claim 9, wherein the IgG1 heavy chain constant region that has been modified to enhance protease resistance of the antibody comprises the amino acid sequence of the IgG1 heavy chain constant region present in SEQ ID NO:60.
11. The antibody or antibody fragment of any one of Claims 5 to 10, wherein the antibody comprises a light chain constant region.
12. The antibody or antibody fragment of Claim 1, wherein the light chain constant region is a human light chain constant region.
13. The antibody or antibody fragment of Claim 12, wherein the human light chain constant region comprises the amino acid sequence of the light chain constant region present in SEQ ID NO:.
14. The antibody or antibody fragment of any one of Claim 1 to 13, wherein the antibody comprises a heavy chain comprising SEQ ID NO:60 and a light chain comprising SEQ ID NO:56.
15. The antibody or antibody fragment of any one of Claims 1 to 13, wherein the antibody comprises a heavy chain comprising SEQ ID NO:61 and a light chain comprising SEQ ID NO:56.

16. The antibody or antibody fragment of any one of Claims 1 to 15, wherein the antibody or antibody fragment is expressed in a cell that is deficient in fucosylation enzymes.
17. The antibody or antibody fragment of Claim 16, wherein the cell is a Chinese hamster ovary (CHO) cell.
18. A composition comprising the antibody or antibody fragment of any one of Claims 1 to 17 and a pharmaceutically acceptable carrier, diluent, or excipient.
19. Use of an effective amount of the antibody or antibody fragment of any one of Claims 1 to 17, or the composition of Claim 18, in the manufacture of a medicament for treating cancer in an individual in need thereof.
20. The use of Claim 19, wherein the cancer is a lung cancer.
21. The use of Claim 19 or 20, wherein the antibody or antibody fragment, or the composition, is to be administered in combination with a second cancer treatment.
22. The use of Claim 21, wherein the second cancer treatment is surgery, chemotherapy, radiation therapy, biologic therapy, targeted therapy, or immunomodulatory therapy, or a combination thereof.
23. Use of an effective amount of the antibody or antibody fragment of any one of Claims 1 to 17, or the composition of Claim 18, in the manufacture of a medicament for treating a non-small cell lung carcinoma (NSCLC) in an individual in need thereof.
24. The antibody or antibody fragment of any one of Claims 1 to 17, wherein the epitope is a conformational epitope.
25. The antibody or antibody fragment of Claim 24, wherein the conformational epitope comprises or is present within residues 103-111 (NLTLLDSGL (SEQ ID NO:62)) and 136-146 (VQTGKDAPSNC (SEQ ID NO:63)) of human VISTA (SEQ ID NO:46).
26. The antibody or antibody fragment of Claim 24, wherein the conformational epitope comprises or is present within residues 24-36 (LLGPVDKGHDVTF (SEQ ID NO:64)), and 54-65 (RRPIRNLTFQDL (SEQ ID NO:65) of human VISTA (SEQ ID NO:46).
27. The antibody or antibody fragment of Claim 24, wherein the conformational epitope comprises amino acid residues in the FG loop of human VISTA (SEQ ID NO:46).
28. Use of a therapeutically effective amount of the antibody or antibody fragment of any one of Claims 1 to 17, in the manufacture of a medicament for enhancing an immune response in an individual in need thereof.
29. The use of Claim 28, wherein the immune response is an antitumor immune response.
30. Use of a therapeutically effective amount of the antibody or antibody fragment of any one of Claims 1 to 17, in the manufacture of a medicament for eliciting a biological response in an individual in need thereof, wherein the biological response is selected from the group consisting of:
    a. activation of monocytes;
    b. induction of T-cell proliferation and cytokine secretion;
    c. increased survival of monocytes;
    d. induction of antibody-dependent cell-mediated cytotoxicity (ADCC) in cells-expressing VISTA; and

e. induction of antibody-dependent cellular phagocytosis (ADCP) in cells expressing VISTA.

31. The use of Claim 19, wherein the cancer is a bladder cancer.
32. The use of Claim 19, wherein the cancer is a breast cancer.
33. The use of any one of Claims 19 to 23, or any one of claims 28 to 32, wherein the individual is a mammal.
34. The use of any one of Claims 19 to 23, or any one of claims 28 to 32, wherein the individual is a human.
35. The use of Claim 19 or 21 or 22, wherein the cancer is a leukemia, lymphoma, myelodisplastic syndrome or myeloma, or a combination thereof.
36. The use of Claim 35, wherein the leukemia is a lymphocytic leukemia or a myelogenous leukemia.
37. The use of Claim 35, wherein the leukemia is acute lymphoblastic leukemia (ALL), chronic lymphocytic leukemia (CLL), acute myeloid (myelogenous) leukemia (AML), chronic myelogenous leukemia (CML); hairy cell leukemia, T-cell prolymphocytic leukemia, large granular lymphocytic leukemia, or adult T-cell leukemia.
38. The use of Claim 35, wherein the cancer is an acute myeloid (myelogenous) leukemia (AML).
39. The use of Claim 35, wherein the cancer is a chronic myelogenous leukemia (CML).
40. The use of Claim 19 or 21 or 22, wherein the cancer is a solid tumor.
41. The use of Claim 40, wherein the solid tumor is surrounded by a tumor stroma comprising myeloid cells, T-cells, or a combination of myeloid cells and T-cells.
42. The use of Claim 40 or 41, wherein the solid tumor is infiltrated with myeloid cells, T cells or a combination of myeloid cells and T-cells.
43. The use of Claim 34, wherein the antibody or antibody fragment, or the composition, is to be administered in combination with a vaccine.
44. Use of an effective amount of the antibody or antibody fragment of Claims 1 to 17 in the manufacture of a medicament for suppressing tumor growth in an individual in need thereof.
45. The use of Claim 33 or 34 or any one of Claims 37 to 44, wherein the composition, antibody or fragment is to be administered parenterally or nonparenterally.
46. The use of Claim 45, wherein the composition, antibody or fragment is to be administered intravenously, subcutaneously or orally.
47. The use of Claim 33 or 34 or any one of Claims 37 to 44, wherein the dosage of the composition, antibody or fragment to be administered is 0.1-15 mg/kg.
48. The use of Claim 33 or 34 or any one of Claims 37 to 44, wherein the composition, antibody or fragment is to be administered from the list consisting of weekly, once every two weeks, once every three weeks, once every month, once every 2 months, and once every 3 months.
49. The antibody or antibody fragment of any one of Claims 1 to 17, or the composition of Claim 18, for use in therapy.