CLAIMS

1. An isolated bispecific antibody or the antigen-binding portion thereof, comprising a prostate-specific membrane antigen (PSMA) binding moiety capable of binding to PSMA, wherein the PSMA binding moiety comprises:

a heavy chain variable region comprising the sequence of SEQ ID NO: 15 or an amino acid sequence encoded by SEQ ID NO: 23 and a light chain variable region comprising the sequence of SEQ ID NO: 16 or an amino acid sequence encoded by SEQ ID NO: 24; and

a CD3 binding moiety that is capable of binding to CD3, wherein the CD3 binding moiety comprises:

a heavy chain variable region comprising the sequence of SEQ ID NO: 13 or an amino acid sequence encoded by SEQ ID NO: 21, and a light chain variable region comprising the sequence of SEQ ID NO: 14 or an amino acid sequence encoded by SEQ ID NO: 22.

2. The isolated bispecific antibody or the antigen-binding portion thereof of any preceding claim, wherein the CD3 binding moiety comprises a heavy chain TCR beta constant region comprising the sequence of SEQ ID NO: 29, and a light chain TCR beta constant region comprising the sequence of SEQ ID NO: 30.

3. The isolated bispecific antibody or the antigen-binding portion thereof of any preceding claim, wherein:

(a) the CD3 binding moiety comprises a heavy chain comprising the sequence of SEQ ID NO: 17, and a light chain comprising the sequence of SEQ ID NO: 18; and/or

(b) the PSMA binding moiety comprises a heavy chain comprising the sequence of SEQ ID NO: 19, and a light chain comprising the sequence of SEQ ID NO: 20.

4. The isolated bispecific antibody or the antigen-binding portion thereof of any preceding claim, which is a monoclonal antibody, a chimeric antibody, or a humanized antibody; optionally a monoclonal antibody which is a human monoclonal antibody.

5. The isolated bispecific antibody or the antigen-binding portion thereof of any preceding claim, which is fused to a constant region of an IgG, optionally a human IgG, optionally, a human IgG1 or human IgG4.

6. A pharmaceutical composition comprising the isolated bispecific antibody or the antigen-binding portion thereof of any preceding claim and a pharmaceutically acceptable carrier.

7. A conjugate comprising the isolated bispecific antibody or the antigen-binding portion thereof of any preceding claim and one or more moieties conjugated to the isolated antibody or the antigen-binding portion thereof.

8. An isolated nucleic acid molecule, comprising a nucleic acid sequence encoding a heavy chain and/or a light chain of the isolated bispecific antibody or the antigen-binding portion thereof of any preceding claim, optionally wherein the nucleic acid sequence comprises any combination of the sequences of SEQ ID NOs:35 to 38.

9. A vector comprising the nucleic acid molecule of claim 8.

10. A host cell comprising the isolated nucleic acid molecule of claim 8 or the vector of claim 9.

11. A method for preparing the bispecific antibody or antigen-binding portion thereof of any one of claims 1-5, comprising:

a) expressing the bispecific antibody or antigen-binding portion thereof in the host cell of claim 10; and

b) isolating the antibody or antigen-binding portion thereof from the host cell.

12. A method for inhibiting growth or metastasis of tumor cells in a subject, comprising administering to the subject an effective amount of the isolated bispecific antibody or antigen-binding portion thereof of any one of claims 1-5 or the pharmaceutical composition of claim 6.

13. A method for modulating an immune response in a subject, comprising administering to the subject an effective amount of the isolated bispecific antibody or antigen-binding portion thereof of any one of claims 1-5 or the pharmaceutical composition of claim 6.

14. A method for treating or preventing a proliferative disorder, autoimmune disease, inflammatory disease, or infectious disease in a subject, comprising administering to the subject an effective amount of the isolated bispecific antibody or antigen-binding portion thereof of any one of claims 1-5 or the pharmaceutical composition of claim 6.

15. The method of claim 14, wherein the method treats a proliferative disorder that is a cancer, optionally prostate cancer, lung cancer, bronchogenic carcinoma, squamous cell carcinoma, small cell carcinoma, large cell carcinoma, adenocarcinoma, alveolar cell carcinoma, bronchial adenoma, chondromatous hamartoma (noncancerous), sarcoma, kidney cancer, breast cancer, gastric cancer, colorectal cancer, glioblastoma, pancreatic cancer, ovarian cancer, or metastatic castration-resistant prostate cancer.

16. The method of claim 15, wherein the cancer is a prostate cancer.

17. The method of any one of claims 12-16, wherein the isolated bispecific antibody or antigen-binding portion thereof of any one of claims 1-5 or the pharmaceutical composition of claim 6 is administered in combination with a chemotherapeutic agent, radiation, and/or another cancer immunotherapy.

18. A kit for treating or diagnosing a proliferative disorder, an immune disorder, or an infection, comprising a container comprising at least one of the isolated bispecific antibody or antigen-binding portion thereof of any one of claims 1-5.

19. An isolated antibody or the antigen-binding portion thereof, comprising a prostate-specific membrane antigen (PSMA) binding moiety capable of binding to PSMA, wherein the PSMA binding moiety comprises:

a heavy chain variable region comprising the sequence of SEQ ID NO: 15 or an amino acid sequence encoded by SEQ ID NO: 23 and a light chain variable region comprising the sequence of SEQ ID NO: 16 or an amino acid sequence encoded by SEQ ID NO: 24.