CLAIMS:

1. A prostate-specific membrane antigen (PSMA)-binding polypeptide comprising a humanized PSMA-binding domain wherein the PSMA binding domain comprises (i) an immunoglobulin light chain variable region comprising LCDR1, LCDR2, and LCDR3, and (ii) an immunoglobulin heavy chain variable region comprising HCDR1, HCDR2, and HCDR3, wherein the LCDR1, LCDR2 and LCDR3 has the amino acid sequences set forth in SEQ ID NO:15, 16 and 17, respectively, and the HCDR1, HCDR2, and HCDR3 has the amino acid sequences set forth in SEQ ID NO:9, 10 and 11, respectively.

2. The PSMA-binding polypeptide of claim 1, wherein said PSMA-binding polypeptide comprises from amino-terminus to carboxyl-terminus

(a) the PSMA binding domain,

(b) a first hinge region, and

(c) an immunoglobulin constant region.

3. The PSMA-binding polypeptide of claim 1, wherein said PSMA-binding polypeptide further comprises a second binding domain, wherein the second binding domain specifically binds a T cell, CD3, CD3ε or a T cell receptor (TCR) complex or a component thereof.

4. The PSMA-binding polypeptide of claim 3, wherein the PSMA-binding polypeptide comprises, in order from amino-terminus to carboxyl-terminus or in order from carboxyl-terminus to amino-terminus

(a) the PSMA binding domain,

(b) a first hinge region,

(c) an immunoglobulin constant region,

(d) a second hinge region, and

(e) a second binding domain.

5. The PSMA-binding protein of claim 3 or 4, wherein the second binding domain is amino-terminal to the second hinge region.

6. The PSMA-binding polypeptide of any one of the previous claims, wherein the immunoglobulin light chain variable region comprises an amino acid sequence that is at least 95% identical to the amino acid sequence set forth in SEQ ID NO:5 or SEQ ID NO:23 and the heavy chain variable region comprises an amino acid sequence that is at least 95% or 100% identical to the amino acid sequence set forth in SEQ ID NO:2, SEQ ID NO:25, or SEQ ID NO:27.

7. The PSMA-binding polypeptide of any one of the previous claims, wherein the PSMA-binding domain competes for binding to human PSMA with a single chain Fv (scFv) having the amino acid sequence set forth in SEQ ID NO:21.

8. The PSMA-binding polypeptide of any one of claims 2-6, wherein the first hinge region is derived from (i) a stalk region of a type II C lectin or (ii) an immunoglobulin hinge region.

9. The PSMA-binding polypeptide of any one of claims 4-7, wherein the second hinge region is derived from (i) a stalk region of a type II C lectin or (ii) an immunoglobulin hinge region.

10. The PSMA-binding polypeptide of any one of the previous claims, wherein the PSMA-binding domain is a single chain Fv (scFv).

11. The PSMA-binding polypeptide of claim 10, wherein said scFv comprises an amino acid sequence that is at least 95% identical to the amino acid sequence set forth in SEQ ID NO:19, SEQ ID NO:21, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:34, or SEQ ID NO:35.

12. The PSMA-binding polypeptide of any one of the preceding claims, wherein said PSMA-binding polypeptide comprises an amino acid sequence that is at least 95% identical to the amino acid sequence set forth in SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:42, SEQ ID NO:43, SEQ ID NO:70, or SEQ ID NO:72.

~~13. The PSMA-binding polypeptide of any one of claims 3-12, wherein the second binding domain specifically binds a T cell, CD3, CD3ε or a T cell receptor (TCR) complex or a component thereof.~~

~~14~~13. The PSMA-binding polypeptide of ~~claim 13~~any one of claims 3-12, wherein the second binding domain competes for binding to CD3ε with a monoclonal antibody selected from the group consisting of CRIS-7and HuM291.

~~15~~14. The PSMA-binding polypeptide of ~~claim 13 or 14~~any one of claims 3-13, wherein the second binding domain comprises an immunoglobulin light chain variable region and an immunoglobulin heavy chain

variable region derived from a monoclonal antibody selected from the group consisting of CRIS-7 and HuM291.

~~16~~15. The PSMA-binding polypeptide of claim ~~15~~14, wherein the light and heavy chain variable regions of the second binding domain are selected from the group consisting of

(a) a light chain variable region comprising an amino acid sequence that is at least 95% or 100% identical to the amino acid sequence set forth in residues 139-245 of SEQ ID NO:47 and a heavy chain variable region comprising an amino acid sequence that is at least 95% or 100% identical to the amino acid sequence set forth in residues 1-121 of SEQ ID NO:47; and

(b) a light chain variable region comprising an amino acid sequence that is at least 95% or 100% identical to the amino acid sequence set forth in residues 634-740 of SEQ ID NO:78 and a heavy chain variable region comprising an amino acid sequence that is at least 95% or 100% identical to the amino acid sequence set forth in residues 496-616 of SEQ ID NO:78.

~~17~~16. The PSMA-binding polypeptide of claim 1, wherein said PSMA-binding polypeptide comprises an amino acid sequence that is at least 95% or 100% identical to the amino acid sequence set forth in SEQ ID NO:49, SEQ ID NO:51, SEQ ID NO:74, SEQ ID NO:76, SEQ ID NO:78, SEQ ID NO:80, SEQ ID NO:82, SEQ ID NO:84, SEQ ID NO:158, SEQ ID NO:160, SEQ ID NO:162, or SEQ ID NO:164.

~~18~~17. A dimeric PSMA-binding protein comprising first and second polypeptide chains, wherein each of said polypeptide chains is the PSMA-binding polypeptide of any one of the previous claims.

~~19~~18. An isolated nucleic acid encoding the PSMA-binding polypeptide of any one of the previous claims.

~~20~~19. A recombinant host cell comprising the nucleic acid of claim ~~19~~18.

~~21~~20. A composition comprising the PSMA-binding protein of claim ~~18~~17; and a pharmaceutically acceptable carrier, diluent, or excipient.

~~22~~21. An *ex vivo* method for inducing redirected T-cell cytotoxicity (RTCC) against a cell expressing prostate-specific membrane antigen (PSMA), the method comprising contacting said PSMA-expressing cell with the PSMA-binding protein of ~~claim 13~~any one of claims 3-12, wherein said contacting is under

conditions whereby RTCC against the PSMA-expressing cell is induced ~~wherein the method is not a method of treatment for the purposes of therapy carried out on the human or animal body~~.

~~23~~22. Use of the dimeric PSMA-binding protein of claim 8 in the manufacture of a medicament for treating a disorder in a subject characterized by overexpression of prostate-specific membrane antigen (PSMA), wherein preferably, the disorder is a cancer, a prostate disorder, a neovascular disorder, a prostate cancer, colorectal cancer, gastric cancer, castrate-resistant prostate cancer, benign prostatic hyperplasia, solid tumor growth, clear cell renal carcinoma, colorectal cancer, bladder cancer, or lung cancer.