Claims

1. A bispecific single chain antibody molecule comprising a first binding domain capable of binding to an epitope of human and non-chimpanzee primate CD3ε (epsilon) chain, wherein the epitope is part of an amino acid sequence comprised in the group consisting of SEQ ID NOs. 2, 4, 6, and 8, and a second binding domain capable of binding to prostate-specific membrane antigen (PSMA).

2. The bispecific single chain antibody molecule of claim 1, wherein at least one of said first or second binding domain is CDR-grafted, humanized or human.

3. The bispecific single chain antibody molecule according to any one of claims 1 or 2, wherein the first binding domain capable of binding to an epitope of human and non-chimpanzee primate CD3ε chain comprises a VL region comprising CDR-L1, CDR-L2 and CDR-L3 selected from:
   (a) CDR-L1 as depicted in SEQ ID NO. 27, CDR-L2 as depicted in SEQ ID NO. 28 and CDR-L3 as depicted in SEQ ID NO. 29;
   (b) CDR-L1 as depicted in SEQ ID NO. 117, CDR-L2 as depicted in SEQ ID NO. 118 and CDR-L3 as depicted in SEQ ID NO. 119; and
   (c) CDR-L1 as depicted in SEQ ID NO. 153, CDR-L2 as depicted in SEQ ID NO. 154 and CDR-L3 as depicted in SEQ ID NO. 155.

4. The bispecific single chain antibody molecule according to any one of claims 1 or 2, wherein the first binding domain capable of binding to an epitope of human and non-chimpanzee primate CD3ε chain comprises a VH region comprising CDR-H 1, CDR-H2 and CDR-H3 selected from:
   (a) CDR-H1 as depicted in SEQ ID NO. 12, CDR-H2 as depicted in SEQ ID NO. 13 and CDR-H3 as depicted in SEQ ID NO. 14;
   (b) CDR-H1 as depicted in SEQ ID NO. 30, CDR-H2 as depicted in SEQ ID NO. 31 and CDR-H3 as depicted in SEQ ID NO. 32;
   (c) CDR-H1 as depicted in SEQ ID NO. 48, CDR-H2 as depicted in SEQ ID NO. 49 and CDR-H3 as depicted in SEQ ID NO. 50;

(d) CDR-H1 as depicted in SEQ ID NO. 66, CDR-H2 as depicted in SEQ ID NO. 67 and CDR-H3 as depicted in SEQ ID NO. 68;

(e) CDR-H1 as depicted in SEQ ID NO. 84, CDR-H2 as depicted in SEQ ID NO. 85 and CDR-H3 as depicted in SEQ ID NO. 86;

(f) CDR-H1 as depicted in SEQ ID NO. 102, CDR-H2 as depicted in SEQ ID NO. 103 and CDR-H3 as depicted in SEQ ID NO. 104;

(g) CDR-H1 as depicted in SEQ ID NO. 120, CDR-H2 as depicted in SEQ ID NO. 121 and CDR-H3 as depicted in SEQ ID NO. 122;

(h) CDR-H1 as depicted in SEQ ID NO. 138, CDR-H2 as depicted in SEQ ID NO. 139 and CDR-H3 as depicted in SEQ ID NO. 140;

(i) CDR-H1 as depicted in SEQ ID NO. 156, CDR-H2 as depicted in SEQ ID NO. 157 and CDR-H3 as depicted in SEQ ID NO. 158; and

(j) CDR-H1 as depicted in SEQ ID NO. 174, CDR-H2 as depicted in SEQ ID NO. 175 and CDR-H3 as depicted in SEQ ID NO. 176.

5. The bispecific single chain antibody molecule according to any one of claims 1 to 3, wherein the first binding domain capable of binding to an epitope of human and non-chimpanzee primate CD3ε chain comprises a VL region selected from the group consisting of a VL region as depicted in SEQ ID NO. 35, 39, 125, 129, 161 or 165.

6. The bispecific single chain antibody molecule according to any one of claims 1 or 2 and 4, wherein the first binding domain capable of binding to an epitope of human and non-chimpanzee primate CD3ε chain comprises a VH region selected from the group consisting of a VH region as depicted in SEQ ID NO. 15, 19, 33, 37, 51, 55, 69, 73, 87, 91, 105, 109, 123, 127, 141, 145, 159, 163, 177 or 181.

7. The bispecific single chain antibody molecule according to any one of claims 1 to 6, wherein the first binding domain capable of binding to an epitope of human and non-chimpanzee primate CD3ε chain comprises a VL region and a VH region selected from the group consisting of:

(a) a VL region as depicted in SEQ ID NO. 17 or 21 and a VH region as depicted in SEQ ID NO. 15 or 19;

(b) a VL region as depicted in SEQ ID NO. 35 or 39 and a VH region as depicted in SEQ ID NO. 33 or 37;

(c) a VL region as depicted in SEQ ID NO. 53 or 57 and a VH region as depicted in SEQ ID NO. 51 or 55;

(d) a VL region as depicted in SEQ ID NO. 71 or 75 and a VH region as depicted in SEQ ID NO. 69 or 73;

(e) a VL region as depicted in SEQ ID NO. 89 or 93 and a VH region as depicted in SEQ ID NO. 87 or 91;

(f) a VL region as depicted in SEQ ID NO. 107 or 111 and a VH region as depicted in SEQ ID NO. 105 or 109;

(g) a VL region as depicted in SEQ ID NO. 125 or 129 and a VH region as depicted in SEQ ID NO. 123 or 127;

(h) a VL region as depicted in SEQ ID NO. 143 or 147 and a VH region as depicted in SEQ ID NO. 141 or 145;

(i) a VL region as depicted in SEQ ID NO. 161 or 165 and a VH region as depicted in SEQ ID NO. 159 or 163; and

(j) a VL region as depicted in SEQ ID NO. 179 or 183 and a VH region as depicted in SEQ ID NO. 177 or 181.

8. The bispecific single chain antibody molecule according to claim 7, wherein the first binding domain capable of binding to an epitope of human and non-chimpanzee primate CD3ε chain comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 23, 25, 41, 43, 59, 61, 77, 79, 95, 97, 113, 115, 131, 133, 149, 151, 167, 169, 185 or 187.

9. The bispecific single chain antibody molecule according to any one of claims 1 to 8, wherein the second binding domain is capable of binding to human PSMA and/or a non-Chimpanzee primate PSMA.

10. The bispecific single chain antibody molecule according to claim 9, wherein the bispecific single chain antibody molecule comprises a group of the following sequences as CDR H1, CDR H2, CDR H3, CDR L1, CDR L2 and CDR L3 in the second binding domain selected from:

a) CDR H1-3 of SEQ ID NO: 394 – 396 and CDR L1-3 of SEQ ID NO: 389 – 391;

b) CDR H1-3 of SEQ ID NO: 408 – 410 and CDR L1-3 of SEQ ID NO: 403 – 405;

c) CDR H1-3 of SEQ ID NO: 422 – 424 and CDR L1-3 of SEQ ID NO: 417 – 419;

d) CDR H1-3 of SEQ ID NO: 436 – 438 and CDR L1-3 of SEQ ID NO: 431 – 433;

e) CDR H1-3 of SEQ ID NO: 445 – 447 and CDR L1-3 of SEQ ID NO: 450 – 452;

f) CDR H1-3 of SEQ ID NO: 464 – 466 and CDR L1-3 of SEQ ID NO: 459 – 461;

g) CDR H1-3 of SEQ ID NO: 478 – 480 and CDR L1-3 of SEQ ID NO: 473 – 475;

h) CDR H1-3 of SEQ ID NO: 492 – 494 and CDR L1-3 of SEQ ID NO: 487 – 489;

i) CDR H1-3 of SEQ ID NO: 506 – 508 and CDR L1-3 of SEQ ID NO: 501 – 503;

j) CDR H1-3 of SEQ ID NO: 520 – 522 and CDR L1-3 of SEQ ID NO: 515 – 517;

k) CDR H1-3 of SEQ ID NO: 534 – 536 and CDR L1-3 of SEQ ID NO: 529 – 531;

l) CDR H1-3 of SEQ ID NO: 548 – 550 and CDR L1-3 of SEQ ID NO: 543 – 545;

m) CDR H1-3 of SEQ ID NO: 562 – 564 and CDR L1-3 of SEQ ID NO: 557 – 559;

n) CDR H1-3 of SEQ ID NO: 576 – 578 and CDR L1-3 of SEQ ID NO: 571 – 573;

o) CDR H1-3 of SEQ ID NO: 590 – 592 and CDR L1-3 of SEQ ID NO: 585 – 587;

p) CDR H1-3 of SEQ ID NO: 604 – 606 and CDR L1-3 of SEQ ID NO: 599 – 601;

q) CDR H1-3 of SEQ ID NO: 618 – 620 and CDR L1-3 of SEQ ID NO: 613 – 615;

r) CDR H1-3 of SEQ ID NO: 632 – 634 and CDR L1-3 of SEQ ID NO: 627 – 629;

s) CDR H1-3 of SEQ ID NO: 646 – 648 and CDR L1-3 of SEQ ID NO: 641 – 643;

t) CDR H1-3 of SEQ ID NO: 660 – 662 and CDR L1-3 of SEQ ID NO: 655 – 657;

u) CDR H1-3 of SEQ ID NO: 674 – 676 and CDR L1-3 of SEQ ID NO: 669 – 671;

v) CDR H1-3 of SEQ ID NO: 688 – 690 and CDR L1-3 of SEQ ID NO: 683 – 685;

w) CDR H1-3 of SEQ ID NO: 702 – 704 and CDR L1-3 of SEQ ID NO: 697 – 699;

x) CDR H1-3 of SEQ ID NO: 716 – 718 and CDR L1-3 of SEQ ID NO: 711 – 713;

y) CDR H1-3 of SEQ ID NO: 729 – 731 and CDR L1-3 of SEQ ID NO: 724 – 726;

z) CDR H1-3 of SEQ ID NO: 788 – 790 and CDR L1-3 of SEQ ID NO: 793 – 795;

aa) CDR H1-3 of SEQ ID NO: 806 – 808 and CDR L1-3 of SEQ ID NO: 811 – 813;

ab) CDR H1-3 of SEQ ID NO: 852 – 854 and CDR L1-3 of SEQ ID NO: 857 – 859;

ac) CDR H1-3 of SEQ ID NO: 838 – 840 and CDR L1-3 of SEQ ID NO: 843 – 845;

ad) CDR H1-3 of SEQ ID NO: 824 – 826 and CDR L1-3 of SEQ ID NO: 829 – 831;

ae) CDR H1-3 of SEQ ID NO: 774 – 776 and CDR L1-3 of SEQ ID NO: 779 – 781;

af) CDR H1-3 of SEQ ID NO: 688 – 690 and CDR L1-3 of SEQ ID NO: 683 – 685;

ag) CDR H1-3 of SEQ ID NO: 870 – 872 and CDR L1-3 of SEQ ID NO: 875 – 877;

ah) CDR H1-3 of SEQ ID NO: 888 – 890 and CDR L1-3 of SEQ ID NO: 893 – 895;

ai) CDR H1-3 of SEQ ID NO: 924 – 926 and CDR L1-3 of SEQ ID NO: 929 – 931;

aj) CDR H1-3 of SEQ ID NO: 1019 – 1021 and CDR L1-3 of SEQ ID NO: 1025 – 1027;

ak) CDR H1-3 of SEQ ID NO: 1006 – 1008 and CDR L1-3 of SEQ ID NO: 1011 – 1013;

al) CDR H1-3 of SEQ ID NO: 906 – 908 and CDR L1-3 of SEQ ID NO: 911 – 913;

am) CDR H1-3 of SEQ ID NO: 992 – 994 and CDR L1-3 of SEQ ID NO: 997 – 999;

an) CDR H1-3 of SEQ ID NO: 942 – 944 and CDR L1-3 of SEQ ID NO: 947 – 949;

ao) CDR H1-3 of SEQ ID NO: 960 – 962 and CDR L1-3 of SEQ ID NO: 965 – 967; and

ap) CDR H1-3 of SEQ ID NO:978 – 980 and CDR L1-3 of SEQ ID NO: 983 – 985.

11. The bispecific single chain antibody molecule of claim 10, wherein the binding domains are arranged in the order VH PSMA-VL PSMA-VH CD3-VL CD3 or VL PSMA-VH PSMA-VH CD3-VL CD3.

12. The bispecific single chain antibody molecule according to claim 11, wherein the bispecific single chain antibody molecule comprises a sequence selected from:

(a) an amino acid sequence as depicted in any of SEQ ID NOs: 399, 413, 427, 441, 455, 469, 483, 497, 511, 525, 539, 553, 567, 581, 595, 609, 623, 637, 651, 665, 679, 693, 707, 721, 734, 799, 817, 863, 849, 835, 785, 899, 935, 1017, 1031, 917, 1003, 953, 971 or 989;

(b) an amino acid sequence encoded by a nucleic acid sequence as depicted in any of SEQ ID NOs: 400, 414, 428, 442, 456, 470, 484, 498, 512, 526, 540, 554, 568, 582, 596, 610, 624, 638, 652, 666, 680, 694, 708, 736 735, 800, 818, 864, 850, 836, 786, 882, 900, 936, 1018, 1032, 918, 1004, 954, 972, 990, 804, 822, 868, 886, 904, 940, 922, 958 or 976; and

(c) an amino acid sequence at least 90 % identical, more preferred at least 95 % identical, most preferred at least 96 % identical to the amino acid sequence of (a) or (b).

13. A nucleic acid sequence encoding a bispecific single chain antibody molecule as defined in any of claims 1 to 12.

14. A vector, which comprises a nucleic acid sequence as defined in claim 13.

15. The vector of claim 14, wherein said vector further comprises a regulatory sequence, which is operably linked to said nucleic acid sequence defined in claim 13.

16. The vector of claim 15, wherein said vector is an expression vector.

17. A host transformed or transfected with a vector defined in any of claims 14 to 16.

18. A process for the production of a bispecific single chain antibody molecule according to any of claims 1 to 12, said process comprising culturing a host defined in claim 17 under conditions allowing the expression of the bispecific single chain antibody molecule as defined in any of claims 1 to 12 and recovering the produced polypeptide from the culture.

19. A pharmaceutical composition comprising a bispecific single chain antibody molecule according to any one of claims 1 to 12, or produced according to the process of claim 18.

20. The pharmaceutical composition of claim 19 for use in the prevention, treatment or amelioration of cancer.

21. A bispecific single chain antibody molecule according to any one of claims 1 to 12, or produced according to the process of claim 18, for use in the prevention, treatment or amelioration of cancer.

22. The pharmaceutical composition of claim 20 or the bispecific single chain antibody molecule of claim 21, wherein said cancer is a solid tumor, preferably a carcinoma or prostate cancer.

23. The pharmaceutical composition of claim 19, 20 or 22 or the bispecific single chain antibody molecule of claim 21 or 22 which, optionally further comprises suitable formulations of carriers, stabilizers and/or excipients.

24. The pharmaceutical composition of claim 19, 20, 22 or 23 or the bispecific single chain antibody molecule of claim 21, 22 or 23, wherein said bispecific single chain antibody molecule or pharmaceutical composition is suitable to be administered in combination with an additional drug.

25. The pharmaceutical composition or bispecific single chain antibody molecule of claim 24, wherein said drug is a non-proteinaceous compound or a proteinaceous compound.

26. The pharmaceutical composition or the bispecific single chain antibody molecule of claim 25, wherein said proteinaceous compound or non-proteinaceous compound is administered simultaneously or non-simultaneously with the bispecific single chain antibody molecule of claim 21, 22, or 23, or the pharmaceutical composition according to claim 19 or 20.

27. Use of a bispecific single chain antibody molecule as defined in any of claims 1 to 12, or produced according to claim 18, for the preparation of a pharmaceutical composition for the prevention, treatment or amelioration of a disease.

28. A method for the prevention, treatment or amelioration of a disease in a subject in the need thereof, said method comprising the step of administration of an effective amount of a pharmaceutical composition of claim 19 or 20.

29. The method of claim 28 or the use of claim 27, wherein said disease is cancer.

30. The method or use of claim 29, wherein said cancer is a solid tumor, preferably a carcinoma or prostate cancer.

31. The method of any of claims 28 to 30 or the use of claim 27, 29 or 30, wherein said pharmaceutical composition is administered in combination with an additional drug.

32. The method or use of claim 31, wherein said drug is a non-proteinaceous compound or a proteinaceous compound.

33. The method or use of claim 32, wherein said proteinaceous compound or non-proteinaceous compound is administered simultaneously or non-simultaneously with a pharmaceutical composition according to claim 19 or 20.

34. The method of any one of claims 28 to 33 or the use of claim 27, or 29 to 33, wherein said subject is a human.

35. A kit comprising a bispecific single chain antibody molecule as defined in any of claims 1 to 12, a nucleic acid molecule as defined in claim 13, a vector as defined in any of claims 14 to 16, or a host as defined in claim 17.

Amended Claims

1. A bispecific single chain antibody molecule comprising a first binding domain which specifically binds to an epitope of human and Callithrix jacchus, Saguinus oedipus or Saimiri sciureus CD3ε (epsilon) chain, wherein said epitope is part of an amino acid sequence comprised in the group consisting of SEQ ID NOs. 2, 4, 6, or 8, and comprises at least the amino acid sequence Gln-Asp-Gly-Asn-Glu, and a second binding domain binding to prostate-specific membrane antigen (PSMA).

2. The bispecific single chain antibody molecule according to claim 1, wherein the first binding domain comprises a VL region comprising CDR-L1, CDR-L2 and CDR-L3 selected from:
   (a) CDR-L1 as depicted in SEQ ID NO. 27, CDR-L2 as depicted in SEQ ID NO. 28 and CDR-L3 as depicted in SEQ ID NO. 29;
   (b) CDR-L1 as depicted in SEQ ID NO. 117, CDR-L2 as depicted in SEQ ID NO. 118 and CDR-L3 as depicted in SEQ ID NO. 119; and
   (c) CDR-L1 as depicted in SEQ ID NO. 153, CDR-L2 as depicted in SEQ ID NO. 154 and CDR-L3 as depicted in SEQ ID NO. 155.

3. The bispecific single chain antibody molecule according to claim 1 or 2, wherein the first binding domain comprises a VH region comprising CDR-H 1, CDR-H2 and CDR-H3 selected from:
   (a) CDR-H1 as depicted in SEQ ID NO. 12, CDR-H2 as depicted in SEQ ID NO. 13 and CDR-H3 as depicted in SEQ ID NO. 14;
   (b) CDR-H1 as depicted in SEQ ID NO. 30, CDR-H2 as depicted in SEQ ID NO. 31 and CDR-H3 as depicted in SEQ ID NO. 32;
   (c) CDR-H1 as depicted in SEQ ID NO. 48, CDR-H2 as depicted in SEQ ID NO. 49 and CDR-H3 as depicted in SEQ ID NO. 50;
   (d) CDR-H1 as depicted in SEQ ID NO. 66, CDR-H2 as depicted in SEQ ID NO. 67 and CDR-H3 as depicted in SEQ ID NO. 68;
   (e) CDR-H1 as depicted in SEQ ID NO. 84, CDR-H2 as depicted in SEQ ID NO. 85 and CDR-H3 as depicted in SEQ ID NO. 86;
   (f) CDR-H1 as depicted in SEQ ID NO. 102, CDR-H2 as depicted in SEQ ID NO. 103 and CDR-H3 as depicted in SEQ ID NO. 104;
   (g) CDR-H1 as depicted in SEQ ID NO. 120, CDR-H2 as depicted in SEQ ID NO. 121 and CDR-H3 as depicted in SEQ ID NO. 122;

(h) CDR-H1 as depicted in SEQ ID NO. 138, CDR-H2 as depicted in SEQ ID NO. 139 and CDR-H3 as depicted in SEQ ID NO. 140;

(i) CDR-H1 as depicted in SEQ ID NO. 156, CDR-H2 as depicted in SEQ ID NO. 157 and CDR-H3 as depicted in SEQ ID NO. 158; and

(j) CDR-H1 as depicted in SEQ ID NO. 174, CDR-H2 as depicted in SEQ ID NO. 175 and CDR-H3 as depicted in SEQ ID NO. 176.

4. The bispecific single chain antibody molecule according to any one of claims 1 to 3, wherein the second binding domain is capable of binding to human PSMA and/or a non-human primate PSMA.

5. The bispecific single chain antibody molecule according to claim 4, wherein the bispecific single chain antibody molecule comprises a group of the following sequences as CDR H1, CDR H2, CDR H3, CDR L1, CDR L2 and CDR L3 in the second binding domain selected from:

a) CDR H1-3 of SEQ ID NO: 394 – 396 and CDR L1-3 of SEQ ID NO: 389 – 391;
b) CDR H1-3 of SEQ ID NO: 408 – 410 and CDR L1-3 of SEQ ID NO: 403 – 405;
c) CDR H1-3 of SEQ ID NO: 422 – 424 and CDR L1-3 of SEQ ID NO: 417 – 419;
d) CDR H1-3 of SEQ ID NO: 436 – 438 and CDR L1-3 of SEQ ID NO: 431 – 433;
e) CDR H1-3 of SEQ ID NO: 445 – 447 and CDR L1-3 of SEQ ID NO: 450 – 452;
f) CDR H1-3 of SEQ ID NO: 464 – 466 and CDR L1-3 of SEQ ID NO: 459 – 461;
g) CDR H1-3 of SEQ ID NO: 478 – 480 and CDR L1-3 of SEQ ID NO: 473 – 475;
h) CDR H1-3 of SEQ ID NO: 492 – 494 and CDR L1-3 of SEQ ID NO: 487 – 489;
i) CDR H1-3 of SEQ ID NO: 506 – 508 and CDR L1-3 of SEQ ID NO: 501 – 503;
j) CDR H1-3 of SEQ ID NO: 520 – 522 and CDR L1-3 of SEQ ID NO: 515 – 517;
k) CDR H1-3 of SEQ ID NO: 534 – 536 and CDR L1-3 of SEQ ID NO: 529 – 531;
l) CDR H1-3 of SEQ ID NO: 548 – 550 and CDR L1-3 of SEQ ID NO: 543 – 545;
m) CDR H1-3 of SEQ ID NO: 562 – 564 and CDR L1-3 of SEQ ID NO: 557 – 559;
n) CDR H1-3 of SEQ ID NO: 576 – 578 and CDR L1-3 of SEQ ID NO: 571 – 573;
o) CDR H1-3 of SEQ ID NO: 590 – 592 and CDR L1-3 of SEQ ID NO: 585 – 587;
p) CDR H1-3 of SEQ ID NO: 604 – 606 and CDR L1-3 of SEQ ID NO: 599 – 601;
q) CDR H1-3 of SEQ ID NO: 618 – 620 and CDR L1-3 of SEQ ID NO: 613 – 615;
r) CDR H1-3 of SEQ ID NO: 632 – 634 and CDR L1-3 of SEQ ID NO: 627 – 629;
s) CDR H1-3 of SEQ ID NO: 646 – 648 and CDR L1-3 of SEQ ID NO: 641 – 643;
t) CDR H1-3 of SEQ ID NO: 660 – 662 and CDR L1-3 of SEQ ID NO: 655 – 657;
u) CDR H1-3 of SEQ ID NO: 674 – 676 and CDR L1-3 of SEQ ID NO: 669 – 671;
v) CDR H1-3 of SEQ ID NO: 688 – 690 and CDR L1-3 of SEQ ID NO: 683 – 685;

w) CDR H1-3 of SEQ ID NO: 702 – 704 and CDR L1-3 of SEQ ID NO: 697 – 699;
x) CDR H1-3 of SEQ ID NO: 716 – 718 and CDR L1-3 of SEQ ID NO: 711 – 713;
y) CDR H1-3 of SEQ ID NO: 729 – 731 and CDR L1-3 of SEQ ID NO: 724 – 726;
z) CDR H1-3 of SEQ ID NO: 788 – 790 and CDR L1-3 of SEQ ID NO: 793 – 795;
aa) CDR H1-3 of SEQ ID NO: 806 – 808 and CDR L1-3 of SEQ ID NO: 811 – 813;
ab) CDR H1-3 of SEQ ID NO: 852 – 854 and CDR L1-3 of SEQ ID NO: 857 – 859;
ac) CDR H1-3 of SEQ ID NO: 838 – 840 and CDR L1-3 of SEQ ID NO: 843 – 845;
ad) CDR H1-3 of SEQ ID NO: 824 – 826 and CDR L1-3 of SEQ ID NO: 829 – 831;
ae) CDR H1-3 of SEQ ID NO: 774 – 776 and CDR L1-3 of SEQ ID NO: 779 – 781;
af) CDR H1-3 of SEQ ID NO: 688 – 690 and CDR L1-3 of SEQ ID NO: 683 – 685;
ag) CDR H1-3 of SEQ ID NO: 870 – 872 and CDR L1-3 of SEQ ID NO: 875 – 877;
ah) CDR H1-3 of SEQ ID NO: 888 – 890 and CDR L1-3 of SEQ ID NO: 893 – 895;
ai) CDR H1-3 of SEQ ID NO: 924 – 926 and CDR L1-3 of SEQ ID NO: 929 – 931;
aj) CDR H1-3 of SEQ ID NO: 1019 – 1021 and CDR L1-3 of SEQ ID NO: 1025 – 1027;
ak) CDR H1-3 of SEQ ID NO: 1006 – 1008 and CDR L1-3 of SEQ ID NO: 1011 – 1013;
al) CDR H1-3 of SEQ ID NO: 906 – 908 and CDR L1-3 of SEQ ID NO: 911 – 913;
am) CDR H1-3 of SEQ ID NO: 992 – 994 and CDR L1-3 of SEQ ID NO: 997 – 999;
an) CDR H1-3 of SEQ ID NO: 942 – 944 and CDR L1-3 of SEQ ID NO: 947 – 949;
ao) CDR H1-3 of SEQ ID NO: 960 – 962 and CDR L1-3 of SEQ ID NO: 965 – 967; and
ap) CDR H1-3 of SEQ ID NO:978 – 980 and CDR L1-3 of SEQ ID NO: 983 – 985.

6. The bispecific single chain antibody molecule of claim 5, wherein the binding domains are arranged in the order VH PSMA-VL PSMA-VH CD3-VL CD3 or VL PSMA-VH PSMA-VH CD3-VL CD3.

7. The bispecific single chain antibody molecule according to claim 6, wherein the bispecific single chain antibody molecule comprises a sequence selected from:
   (a) an amino acid sequence as depicted in any of SEQ ID NOs: 399, 413, 427, 441, 455, 469, 483, 497, 511, 525, 539, 553, 567, 581, 595, 609, 623, 637, 651, 665, 679, 693, 707, 721, 734, 799, 817, 863, 849, 835, 785, 899, 935, 1017, 1031, 917, 1003, 953, 971 or 989;
   (b) an amino acid sequence encoded by a nucleic acid sequence as depicted in any of SEQ ID NOs: 400, 414, 428, 442, 456, 470, 484, 498, 512, 526, 540, 554, 568, 582, 596, 610, 624, 638, 652, 666, 680, 694, 708, 736 735, 800,

818, 864, 850, 836, 786, 882, 900, 936, 1018, 1032, 918, 1004, 954, 972, 990, 804, 822, 868, 886, 904, 940, 922, 958 or 976; and

(c) an amino acid sequence at least 90 % identical, more preferred at least 95 % identical, most preferred at least 96 % identical to the amino acid sequence of (a) or (b).

8. A nucleic acid sequence encoding a bispecific single chain antibody molecule as defined in any of claims 1 to 7.

9. A vector, which comprises a nucleic acid sequence as defined in claim 8.

10. A host cell transformed or transfected with a vector defined in any of claims 6 to 9.

11. A process for the production of a bispecific single chain antibody molecule according to any of claims 1 to 7, said process comprising culturing a host cell defined in claim 10 under conditions allowing the expression of the bispecific single chain antibody molecule as defined in any of claims 1 to 7 and recovering the produced polypeptide from the culture.

12. A pharmaceutical composition comprising a bispecific single chain antibody molecule according to any one of claims 1 to 7, or produced according to the process of claim 11.

13. A bispecific single chain antibody molecule according to any one of claims 1 to 7, or produced according to the process of claim 11, for use in the prevention, treatment or amelioration of cancer.

14. The bispecific single chain antibody molecule of claim 13, wherein said cancer is a solid tumor, preferably a carcinoma or prostate cancer.

15. A kit comprising a bispecific single chain antibody molecule as defined in any of claims 1 to 7, a nucleic acid molecule as defined in claim 8, a vector as defined in claim 9, or a host cell as defined in claim 10.

16. The bispecific single chain antibody molecule of claim 1, wherein said first binding domain binds to the N-terminal CD3 epsilon polypeptide fragment in vitro and to the

native CD3 epsilon subunit of the CD3 complex on T cells in vivo with the same binding affinity.

17. The bispecific single chain antibody molecule of claim 1, wherein said epitope is part of an amino acid sequence comprising 26, 25, 24, 23, 22, 21 , 20, 19, 18, 17, 16, 15, 14, 13, 12, 11 , 10, 9, 8, 7, 6 or 5 amino acids.

18. The bispecific single chain antibody molecule of claim 1, wherein the homogeneity of the bispecific single chain antibody molecule is at least 90%, 95% or 98%.