CLAIM(S):

1. An isolated or purified TCR comprising the amino acid sequences of all of SEQ ID NOs: 9-14.

2. The isolated or purified TCR of claim 1, comprising:

(i) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 15;

(ii) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 16;

(iii) an amino acid sequence at least 99% identical to amino acids 20-129 of SEQ ID NO: 15;

(iv) an amino acid sequence at least 99% identical to amino acids 22-133 of SEQ ID NO: 16; or

(v) both (i) and (ii); both (i) and (iv); both (ii) and (iii); or both (iii) and (iv).

3. The isolated or purified TCR of claim 1, comprising:

(i) the amino acid sequence of SEQ ID NO: 15;

(ii) the amino acid sequence of SEQ ID NO: 16;

(iii) amino acids 20-129 of SEQ ID NO: 15;

(iv) amino acids 22-133 of SEQ ID NO: 16; or

(v) both (i) and (ii); both (i) and (iv); both (ii) and (iii); or both (iii) and (iv).

4. The isolated or purified TCR of any one of claims 1-3, further comprising:

(A) an α chain constant region comprising an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 46, wherein:

(i) X at position 48 of SEQ ID NO: 46 is Thr or Cys;

(ii) X at position 112 of SEQ ID NO: 46 is Ser, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(iii) X at position 114 of SEQ ID NO: 46 is Met, Ala, Val, Leu, Ile, Pro, Phe, or Trp;

and

(iv) X at position 115 of SEQ ID NO: 46 is Gly, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(B) a β chain constant region comprising an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 47, wherein X at position 57 of SEQ ID NO: 47 is Ser or Cys; or

(C) both (A) and (B).

5. The isolated or purified TCR of any one of claims 1-3, further comprising:

(A) an α chain constant region comprising the amino acid sequence of SEQ ID NO: 46, wherein:

(i) X at position 48 of SEQ ID NO: 46 is Thr or Cys;

(ii) X at position 112 of SEQ ID NO: 46 is Ser, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(iii) X at position 114 of SEQ ID NO: 46 is Met, Ala, Val, Leu, Ile, Pro, Phe, or Trp;

and

(iv) X at position 115 of SEQ ID NO: 46 is Gly, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(B) a β chain constant region comprising the amino acid sequence of SEQ ID NO: 47, wherein X at position 57 of SEQ ID NO: 47 is Ser or Cys; or

(C) both (A) and (B).

6. The isolated or purified TCR of any one of claims 1-5, comprising:

(1) an α chain comprising an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 50;

(2) a β chain comprising an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 51;

(3) an α chain comprising an amino acid sequence at least 99% identical to amino acids 20-266 of SEQ ID NO: 50;

(4) a β chain comprising an amino acid sequence at least 99% identical to amino acids 22-306 of SEQ ID NO: 51; or

(5) both (1) and (2); both (1) and (4); both (2) and (3); or both (3) and (4).

7. The isolated or purified TCR of any one of claims 1-5, comprising:

(1) an α chain comprising the amino acid sequence of SEQ ID NO: 50;

(2) a β chain comprising the amino acid sequence of SEQ ID NO: 51;

(3) an α chain comprising amino acids 20-266 of SEQ ID NO: 50;

(4) a β chain comprising amino acids 22-306 of SEQ ID NO: 51; or

(5) both (1) and (2); both (1) and (4); both (2) and (3); or both (3) and (4).

8. An isolated or purified polypeptide comprising the amino acid sequences of all of SEQ ID NOs: 9-14.

9. The isolated or purified polypeptide of claim 8, comprising:

(i) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 15;

(ii) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 16;

(iii) an amino acid sequence at least 99% identical to amino acids 20-129 of SEQ ID NO: 15;

(iv) an amino acid sequence at least 99% identical to amino acids 22-133 of SEQ ID NO: 16; or

(v) both (i) and (ii); both (i) and (iv); both (ii) and (iii); or both (iii) and (iv).

10. The isolated or purified polypeptide of claim 8, comprising:

(i) the amino acid sequence of SEQ ID NO: 15;

(ii) the amino acid sequence of SEQ ID NO: 16;

(iii) amino acids 20-129 of SEQ ID NO: 15;

(iv) amino acids 22-133 of SEQ ID NO: 16; or

(v) both (i) and (ii); both (i) and (iv); both (ii) and (iii); or both (iii) and (iv).

11. The isolated or purified polypeptide of any one of claims 8-10, further comprising:

(A) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 46, wherein:

(i) X at position 48 of SEQ ID NO: 46 is Thr or Cys;

(ii) X at position 112 of SEQ ID NO: 46 is Ser, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(iii) X at position 114 of SEQ ID NO: 46 is Met, Ala, Val, Leu, Ile, Pro, Phe, or Trp;

and

(iv) X at position 115 of SEQ ID NO: 46 is Gly, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(B) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 47, wherein X at position 57 of SEQ ID NO: 47 is Ser or Cys; or

(C) both (A) and (B).

12. The isolated or purified polypeptide of any one of claims 8-10, further comprising:

(A) the amino acid sequence of SEQ ID NO: 46, wherein:

(i) X at position 48 of SEQ ID NO: 46 is Thr or Cys;

(ii) X at position 112 of SEQ ID NO: 46 is Ser, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(iii) X at position 114 of SEQ ID NO: 46 is Met, Ala, Val, Leu, Ile, Pro, Phe, or Trp;

and

(iv) X at position 115 of SEQ ID NO: 46 is Gly, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(B) the amino acid sequence of SEQ ID NO: 47, wherein X at position 57 of SEQ ID NO: 47 is Ser or Cys; or

(C) both (A) and (B).

13. The isolated or purified polypeptide of any one of claims 8-12, comprising:

(1) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 50;

(2) an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 51;

(3) an amino acid sequence at least 99% identical to amino acids 20-266 of SEQ ID NO: 50;

(4) an amino acid sequence at least 99% identical to amino acids 22-306 of SEQ ID NO: 51; or

(5) both (1) and (2); both (1) and (4); both (2) and (3); or both (3) and (4).

14. The isolated or purified polypeptide of any one of claims 8-12, comprising:

(1) the amino acid sequence of SEQ ID NO: 50;

(2) the amino acid sequence of SEQ ID NO: 51;

(3) amino acids 20-266 of SEQ ID NO: 50;

(4) amino acids 22-306 of SEQ ID NO: 51; or

(5) both (1) and (2); both (1) and (4); both (2) and (3); or both (3) and (4).

15. An isolated or purified protein comprising:

(a) a first polypeptide chain comprising the amino acid sequences of SEQ ID NOs: 9-11; and

(b) a second polypeptide chain comprising the amino acid sequences of SEQ ID NOs: 12-14.

16. The isolated or purified protein of claim 15 comprising:

(i) a first polypeptide chain comprising an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 15;

(ii) a second polypeptide chain comprising an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 16;

(iii) a first polypeptide chain comprising an amino acid sequence at least 99% identical to amino acids 20-129 of SEQ ID NO: 15;

(iv) a second polypeptide chain comprising an amino acid sequence at least 99% identical to amino acids 22-133 of SEQ ID NO: 16; or

(v) both (i) and (ii); both (i) and (iv); both (ii) and (iii); or both (iii) and (iv).

17. The isolated or purified protein of claim 15 comprising:

(i) a first polypeptide chain comprising the amino acid sequence of SEQ ID NO: 15;

(ii) a second polypeptide chain comprising the amino acid sequence of SEQ ID NO: 16;

(iii) a first polypeptide chain comprising amino acids 20-129 of SEQ ID NO: 15;

(iv) a second polypeptide chain comprising amino acids 22-133 of SEQ ID NO: 16; or

(v) both (i) and (ii); both (i) and (iv); both (ii) and (iii); or both (iii) and (iv).

18. The isolated or purified protein of any one of claims 15-17, wherein:

(A) the first polypeptide chain further comprises an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 46, wherein:

(i) X at position 48 of SEQ ID NO: 46 is Thr or Cys;

(ii) X at position 112 of SEQ ID NO: 46 is Ser, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(iii) X at position 114 of SEQ ID NO: 46 is Met, Ala, Val, Leu, Ile, Pro, Phe, or Trp;

and

(iv) X at position 115 of SEQ ID NO: 46 is Gly, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(B) the second polypeptide chain further comprises an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 47, wherein X at position 57 of SEQ ID NO: 47 is Ser or Cys; or

(C) both (A) and (B).

19. The isolated or purified protein of any one of claims 15-17, wherein:

(A) the first polypeptide chain further comprises the amino acid sequence of SEQ ID NO: 46, wherein:

(i) X at position 48 of SEQ ID NO: 46 is Thr or Cys;

(ii) X at position 112 of SEQ ID NO: 46 is Ser, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(iii) X at position 114 of SEQ ID NO: 46 is Met, Ala, Val, Leu, Ile, Pro, Phe, or Trp;

and

(iv) X at position 115 of SEQ ID NO: 46 is Gly, Ala, Val, Leu, Ile, Pro, Phe, Met, or Trp;

(B) the second polypeptide chain further comprises the amino acid sequence of SEQ ID NO: 47, wherein X at position 57 of SEQ ID NO: 47 is Ser or Cys; or

(C) both (A) and (B).

20. The isolated or purified protein of any one of claims 15-19, wherein:

(1) the first polypeptide chain comprises an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 50;

(2) the second polypeptide chain comprises an amino acid sequence at least 99% identical to the amino acid sequence of SEQ ID NO: 51;

(3) the first polypeptide chain comprises an amino acid sequence at least 99% identical to amino acids 20-266 of SEQ ID NOs: 50;

(4) the second polypeptide chain comprises an amino acid sequence at least 99% identical to amino acids 22-306 of SEQ ID NO: 51; or

(5) both (1) and (2); both (1) and (4); both (2) and (3); or both (3) and (4).

21. The isolated or purified protein of any one of claims 15-19, wherein:

(1) the first polypeptide chain comprises the amino acid sequence of SEQ ID NO: 50;

(2) the second polypeptide chain comprises the amino acid sequence of SEQ ID NO: 51;

(3) the first polypeptide chain comprises amino acids 20-266 of SEQ ID NOs: 50;

(4) the second polypeptide chain comprises amino acids 22-306 of SEQ ID NO: 51; or

(5) both (1) and (2); both (1) and (4); both (2) and (3); or both (3) and (4).

22. An isolated or purified nucleic acid comprising a nucleotide sequence encoding the TCR of any one of claims 1-7, the polypeptide of any one of claims 8-14, or the protein of any one of claims 15-21.

23. A recombinant expression vector comprising the nucleic acid of claim 22.

24. An isolated or purified host cell comprising the recombinant expression vector of claim 23.

25. A population of cells comprising at least one isolated or purified host cell of claim 24.

26. A pharmaceutical composition comprising one or more T cells expressing the TCR of any one of claims 1-7, the polypeptide of any one of claims 8-14, or the protein of any one of claims 15-21, and a pharmaceutically acceptable carrier.

27. A method of detecting the presence of a $KRAS^{G12D}$-positive cancer in a mammal, the method comprising:

(a) contacting a sample comprising cells of the cancer with the TCR of any one of claims 1-7, the polypeptide of any one of claims 8-14, or the protein of any one of claims 15-21, thereby forming a complex, wherein the TCR, polypeptide, and protein comprise a detectable label; and

(b) detecting the complex,

wherein detection of the complex is indicative of the presence of a $KRAS^{G12D}$-positive cancer in the mammal.

28. The method of claim 27, wherein the cancer is pancreatic, colorectal, lung, endometrial, ovarian, or prostate cancer.

29. Use of one or more T cells expressing the TCR of any one of claims 1-7, the polypeptide of any one of claims 8-14, or the protein of any one of claims 15-21, in the manufacture of a medicament for the treatment of a $KRAS^{G12D}$-positive cancer in a mammal.

30. The use of claim 29, wherein the cancer is pancreatic, colorectal, lung, endometrial, ovarian, or prostate cancer.