

Claims:

1. A mutant IgG2 Fc polypeptide fragment, wherein the mutant IgG2 Fc polypeptide fragment has the following features:

(i) said mutant IgG2 Fc polypeptide fragment has a mutation at L328 and optionally at position(s) selected from the group consisting of: H268, S267, P271, G327, or a combination thereof, with respect to the wild-type IgG2 Fc fragment of SEQ ID NO: 20, the mutation is selected from one of the group consisting of: L328W, L328E, L328Y, L328M, L328A, L328G, L328N, L328P, L328R, L328V, H268D/S298L/L328W, S267V/S298L/L328W, V234M/S267E/S298L/L328W, A235W/V266L/S298L/L328W, V234Q/A235G/P238L/S239V/H268D/G327A/L328E/A330S/I332T, S239V/V266L/S298L/L328W, V266L/L328W, P233F/V266L/S298L/L328W, V266L/S298L/L328W, V234Q/A235G/P238L/S239V/G327A/L328E/A330S/I332T, S267V/S298G/L328W, V234Q/A235G/P238L/S239V/S267E/S298L/G327A/L328E/A330S/I332T, and L328E/I332T; and the numbering of all amino acids is based on the IgG Eu numbering; and

(ii) the affinity of the mutant IgG2 Fc polypeptide fragment to FcγRIIB is increased compared to the wild-type IgG2 Fc polypeptide fragment of SEQ ID NO: 20.

2. A mutant immunoglobulin IgG2 Fc polypeptide fragment, wherein the mutant immunoglobulin IgG2 Fc polypeptide fragment comprises the mutant IgG2 Fc polypeptide fragment according to claim 1.

3. The mutant immunoglobulin Fc polypeptide fragment according to claim 2, wherein the mutant immunoglobulin Fc polypeptide fragment improve the agonistic activity of an antibody.

4. An antibody, wherein the antibody comprises the mutant IgG2 Fc polypeptide fragment according to claim 1 or the mutant immunoglobulin IgG2 Fc

polypeptide fragment according to claim 2 or 3.

5. A recombinant protein, wherein the recombinant protein comprises the mutant IgG2 Fc polypeptide fragment according to claim 1, the mutant immunoglobulin IgG2 Fc polypeptide fragment according to claim 2 or 3, or the antibody according to claim 4.

6. An isolated polynucleotide, wherein the polynucleotide encodes the mutant IgG2 Fc polypeptide fragment according to claim 1, the mutant immunoglobulin IgG2 Fc polypeptide fragment according to claim 2 or 3, the antibody according to claim 4, or the recombinant protein according to claim 5.

7. A vector, wherein the vector comprises the isolated polynucleotide according to claim 6.

8. A host cell, wherein the host cell contains the vector according to claim 7, or having the polynucleotide according to claim 6 integrated into the genome of the cell;

or, the host cell expresses the mutant IgG2 Fc polypeptide fragment according to claim 1, the mutant immunoglobulin IgG2 Fc polypeptide fragment according to claim 2, the antibody according to claim 3, or the recombinant protein according to claim 4.

9. A pharmaceutical composition, wherein the pharmaceutical composition comprises:

(a) the antibody according to claim 4, or the recombinant protein according to claim 4; and

(b) a pharmaceutically acceptable carrier.

10. A method of producing the mutant IgG2 Fc polypeptide fragment according to claim 1, the mutant immunoglobulin IgG2 Fc polypeptide fragment according to claim 2 or 3, the antibody according to claim 4, or the recombinant protein according to claim 5, wherein the method comprises the steps of:

(i) culturing the host cell according to claim 8 under suitable conditions to obtain a culture comprising said mutant IgG2 Fc polypeptide fragment, said mutant

immunoglobulin IgG2 Fc polypeptide fragment, said antibody, or said recombinant protein; and

(ii) purifying and/or separating said mutant IgG2 Fc polypeptide fragment, said mutant immunoglobulin IgG2 Fc polypeptide fragment, said antibody, or said recombinant protein from the culture obtained in step (i).

11. Use of the mutant Fc polypeptide fragment according to claim 1, the mutant immunoglobulin Fc region according to claim 2, the antibody according to claim 4, the recombinant protein according to claim 5, the polynucleotide according to claim 6, the vector according to claim 7 and/or the host cell according to claim 8, in the manufacture of a pharmaceutical composition for proliferating T cells for treating tumors.