

CLAIMS

1. An anti-v δ 1 antibody or fragment thereof for use in a method of treating cancer, an infectious disease or an inflammatory disease, wherein binding of the anti-V δ 1 antibody has an activating effect on $\gamma\delta$ TCR activity.
2. The anti-v δ 1 antibody or fragment thereof effor use according to claim 1, wherein the anti-V δ 1 antibody or fragment thereof, comprises one or more of:
 - a CDR3 comprising a sequence having at least 80% sequence identity with any one of SEQ ID NOs: 2-25;
 - a CDR2 comprising a sequence having at least 80% sequence identity with any one of SEQ ID NOs: 26-37 and SEQUENCES: A1-A12 (of Table 2); and/or
 - a CDR1 comprising a sequence having at least 80% sequence identity with any one of SEQ ID NOs: 38-61.
3. The anti-v δ 1 antibody or fragment thereof effor use according to claim 1, wherein the anti-V δ 1 antibody or fragment thereof, comprises:
 - a) a VH region comprising a CDR3 comprising a sequence of SEQ ID NO: 2, a CDR2 comprising a sequence of SEQ ID NO: 26, and a CDR1 comprising a sequence of SEQ ID NO: 38;
 - b) ~~4. — The anti-v δ 1 antibody or fragment thereof of claim 1, wherein the anti-V δ 1 antibody or fragment thereof, comprises~~ a VH region comprising a CDR3 comprising a sequence of SEQ ID NO: 4, a CDR2 comprising a sequence of SEQ ID NO: 28, and a CDR1 comprising a sequence of SEQ ID NO: 40;
 - c) ~~5. — The anti-v δ 1 antibody or fragment thereof of claim 1, wherein the anti-V δ 1 antibody or fragment thereof, comprises~~ a VH region comprising a CDR3 comprising a sequence of SEQ ID NO: 3, a CDR2 comprising a sequence of SEQ ID NO: 27, and a CDR1 comprising a sequence of SEQ ID NO: 39;
 - d) ~~6. — The anti-v δ 1 antibody or fragment thereof of claim 1, wherein the anti-V δ 1 antibody or fragment thereof, comprises~~ a VL region comprising a CDR3 comprising a sequence of SEQ ID NO: 14, a CDR2 comprising a sequence of SEQUENCE: A1, and a CDR1 comprising a sequence of SEQ ID NO: 50;

- e) ~~7. The anti-vδ1 antibody or fragment thereof of claim 1, wherein the anti-Vδ1 antibody or fragment thereof, comprises~~ a VL region comprising a CDR3 comprising a sequence of SEQ ID NO: 16, a CDR2 comprising a sequence of SEQUENCE: A3, and a CDR1 comprising a sequence of SEQ ID NO: 52; or
- f) ~~8. The anti-vδ1 antibody or fragment thereof of claim 1, wherein the anti-Vδ1 antibody or fragment thereof, comprises~~ a VL region comprising a CDR3 comprising a sequence of SEQ ID NO: 15, a CDR2 comprising a sequence of SEQUENCE: A2, and a CDR1 comprising a sequence of SEQ ID NO: 51.

94. The anti-vδ1 antibody or fragment thereof effor use according to claim 1, wherein the anti-Vδ1 antibody or fragment thereof, comprises one or more of:

- a) a VH region comprising an amino acid sequence having at least 80% sequence identity with any one of SEQ ID NOs: 62-73; and/or
- b) and a VL region, wherein the VH and VL region are joined by a linker, such as a polypeptide linker comprising an amino acid sequence having at least 80% sequence identity with any one of SEQ ID NOs: 74-85.

105. The anti-vδ1 antibody or fragment thereof effor use according to claim 1, wherein the anti-Vδ1 antibody or fragment thereof, comprises one or more of: binds to the same, or essentially the same, epitope as, or competes with, an antibody or fragment thereof as defined in any one of claims 1 to 9.

- a) a VH region comprising an amino acid sequence of SEQ ID NO: 62 and a VL region comprising an amino acid sequence of SEQ ID NO: 74;
- b) a VH region comprising an amino acid sequence of SEQ ID NO: 63 and a VL region comprising an amino acid sequence of SEQ ID NO: 75;
- c) a VH region comprising an amino acid sequence of SEQ ID NO: 64 and a VL region comprising an amino acid sequence of SEQ ID NO: 76;
- d) a VH region comprising an amino acid sequence of SEQ ID NO: 68 and a VL region comprising an amino acid sequence of SEQ ID NO: 80;
- e) a VH region comprising an amino acid sequence of SEQ ID NO: 69 and a VL region comprising an amino acid sequence of SEQ ID NO: 81;
- f) a VH region comprising an amino acid sequence of SEQ ID NO: 70 and a VL region comprising an amino acid sequence of SEQ ID NO: 82; or
- g) a VH region comprising an amino acid sequence of SEQ ID NO: 71 and a VL region comprising an amino acid sequence of SEQ ID NO: 83.

~~116.~~ The anti-v δ 1 antibody or fragment thereof ~~effor~~ for use according to any one of claims 1 to 5, wherein the ~~anti-V δ 1 antibody or fragment thereof binds to an epitope of a variable delta 1 (V δ 1) chain of a $\gamma\delta$ T cell receptor (TCR) comprising one or more amino acid residues within amino acids 1-90 of SEQ ID NO: 1~~ is an isolated multi-specific antibody that binds to at least two target antigens, wherein the first of the at least two target antigens is V δ 1.

~~127.~~ The anti-v δ 1 antibody or fragment thereof ~~effor~~ for use according to any one of claim 11 to 6, wherein the ~~epitope comprises at least one of amino acid residues 3, 5, 9, 10, 12, 16, 17, 20, 37, 42, 50, 53, 59, 62, 64, 68, 69, 72 or 77 of SEQ ID NO: 1~~ the antibody or fragment thereof binds to an activating epitope of a $\gamma\delta$ T cell.

~~138.~~ The anti-v δ 1 antibody or fragment thereof ~~for use according to any one of claims 11 to 127~~, wherein the ~~epitope comprises one or more amino acid residues within amino acid regions: 5-20 and 62-77; 50-64; 37-53 and 59-72; 59-77; or 3-17 and 62-69, of SEQ ID NO: 1~~ anti-V δ 1 antibody or fragment thereof binds to an epitope of a variable delta 1 (V δ 1) chain of a $\gamma\delta$ T cell receptor (TCR) comprising one or more amino acid residues within amino acids 1-90 of SEQ ID NO: 1; optionally
wherein the epitope comprises at least one of amino acid residues 3, 5, 9, 10, 12, 16, 17, 20, 37, 42, 50, 53, 59, 62, 64, 68, 69, 72 or 77 of SEQ ID NO: 1.

~~149.~~ The anti-v δ 1 antibody or fragment thereof ~~effor~~ for use according to any one of claims 11 to ~~138~~, wherein the epitope:

~~a) consists~~comprises of one or more amino acid residues within amino acid regions: 5-20 and 62-77; 50-64; 37-53 and 59-72; 59-77; or 3-17 and 62-69 of SEQ ID NO: 1;

b) consists of one or more amino acid residues within amino acid regions: 5-20 and 62-77; 50-64; 37-53 and 59-72; 59-77; or 3-17 and 62-69 of SEQ ID NO: 1;

~~15.~~ The anti-v δ 1 antibody or fragment thereof of any one of claims 11 to 14, wherein the ~~epitope c)~~ comprises one or more amino acid residues within amino acid regions 5-20 and 62-77 of SEQ ID NO: 1;

~~16.~~ The anti-v δ 1 antibody or fragment thereof of any one of claims 11 to 15, wherein the ~~epitope d)~~ comprises one or more amino acid residues within amino acid region 50-64 of SEQ ID NO: 1;

~~17. The anti-vδ1 antibody or fragment thereof of any one of claims 11 to 16, wherein the epitope-e) comprises one or more amino acid residues within amino acid regions 37-53 and 59-77 of SEQ ID NO: 1; and/or~~

~~18. The anti-vδ1 antibody or fragment thereof of any one of claims 11 to 17, wherein the epitope-f) is an activating epitope of a γδ T cell.~~

~~19~~10. The anti-vδ1 antibody or fragment thereof for use according to any one of claims 1 to 9, wherein the anti-Vδ1 antibody or fragment thereof ~~as defined in any one of claims 1 to 18,~~ is an scFv, Fab, Fab', F(ab')₂, Fv, variable domain (e.g. VH or VL), diabody, minibody or full length antibody.

~~20. The anti-vδ1 antibody or fragment thereof of claim 19, wherein the antibody or fragment thereof comprises an amino acid sequence having at least 80% sequence identity with SEQ ID NO: 111.~~

~~21. The anti-vδ1 antibody or fragment thereof of claim 19, wherein the antibody or fragment thereof comprises an amino acid sequence having at least 80% sequence identity with SEQ ID NO: 112.~~

~~22. The anti-vδ1 antibody or fragment thereof of claim 19, wherein the antibody or fragment thereof comprises an amino acid sequence having at least 80% sequence identity with SEQ ID NO: 116.~~

~~23~~11. An isolated ~~multi-specific~~human anti-Vδ1 antibody or fragment thereof, wherein the anti-Vδ1 antibody or fragment thereof is as defined in any one of claims 1 to 10, that binds to at least two target antigens, wherein the first of the at least two target antigens is Vδ1, and which comprises one or more of:

~~a CDR3 comprising a sequence having at least 80% sequence identity with any one of SEQ ID NOs: 2-25;~~

~~a CDR2 comprising a sequence having at least 80% sequence identity with any one of SEQ ID NOs: 26-37 and SEQUENCES: A1-A12 (of Table 2); and/or~~

~~a CDR1 comprising a sequence having at least 80% sequence identity with any one of SEQ ID NOs: 38-61.~~

12. An isolated multi-specific antibody or fragment thereof that binds to at least two target antigens, wherein the first of the at least two target antigens is Vδ1.

13. The isolated multi-specific antibody or fragment thereof of claim 12 wherein the isolated multi-specific antibody or fragment thereof is as defined in any one of claims 1 to 10.

2414. The isolated multi-specific anti-vδ1 antibody or fragment thereof for use according to claims 231 to 10, the anti-vδ1 antibody or fragment thereof of claim 11 or the isolated multi-specific antibody or fragment thereof of claim 12, comprising a VH region and VL region wherein the VH and VL region are joined by a linker, such as a polypeptide linker.

~~25. An isolated multi-specific antibody or fragment thereof, which binds to the same, or essentially the same, Vδ1 epitope as, or competes with, an antibody or fragment thereof as defined in any one of claims 23 or 24.~~

~~26. A human, isolated anti-TCR delta variable 1, multi-specific antibody or fragment thereof, that binds to at least two target antigens, wherein the first of the at least two target antigens is Vδ1, and wherein the multi-specific antibody or fragment thereof which binds to an epitope of Vδ1 comprising one or more amino acid residues within amino acids 1-90 of SEQ ID NO: 1.~~

~~27. The human, isolated multi-specific antibody or fragment thereof as defined in claim 132, wherein the epitope comprises at least one of amino acid residues 3, 5, 9, 10, 12, 16, 17, 20, 37, 42, 50, 53, 59, 62, 64, 68, 69, 72 or 77 of SEQ ID NO: 1.~~

~~28. The human, isolated multi-specific antibody or fragment thereof as defined in claim 26 or claim 27, wherein the epitope comprises one or more amino acid residues within amino acid regions: 5-20 and 62-77; 50-64; 37-53 and 59-72; 59-77; or 3-17 and 62-69, of SEQ ID NO: 1.~~

~~29. The human, isolated multi-specific antibody or fragment thereof as defined in claim 28, wherein the epitope consists of one or more amino acid residues within amino acid regions: 5-20 and 62-77; 50-64; 37-53 and 59-72; 59-77; or 3-17 and 62-69 of SEQ ID NO: 1.~~

~~30. — The human, isolated multi-specific antibody or fragment thereof as defined in any one of claims 26 to 29, wherein the epitope comprises one or more amino acid residues within amino acid regions 5-20 and 62-77 of SEQ ID NO: 1.~~

~~31. — The human, isolated multi-specific antibody or fragment thereof as defined in any one of claims 26 to 30, wherein the epitope comprises one or more amino acid residues within amino acid region 50-64 of SEQ ID NO: 1.~~

~~32. — The human, isolated multi-specific antibody or fragment thereof as defined in any one of claims 26 to 31, wherein the epitope comprises one or more amino acid residues within amino acid regions 37-53 and 59-77 of SEQ ID NO: 1.~~

~~33. — The human, isolated multi-specific antibody or fragment thereof as defined in any one of claims 26 to 32, wherein the epitope is an activating epitope of a $\gamma\delta$ T cell.~~

~~34. — The isolated multi-specific antibody as defined in claim 26, which comprises an amino acid sequence having at least 80% sequence identity with SEQ ID NO: 111.~~

~~35. — The isolated multi-specific antibody as defined in claim 26, which comprises an amino acid sequence having at least 80% sequence identity with SEQ ID NO: 112.~~

~~36. — The isolated multi-specific antibody as defined in claim 26, which comprises an amino acid sequence having at least 80% sequence identity with SEQ ID NO: 116.~~

3715. The anti- $\nu\delta 1$ antibody or fragment thereof for use according to claim 7 or the isolated multi-specific antibody or fragment thereof as defined in any one of claims 2312 to 3614, wherein the second of the at least two target antigens is one selected from the group consisting of EGFR and CD19.

3816. The isolated multi-specific antibody or fragment thereof as defined in any one of claims 2312 to 3715 for use as a medicament.

3917. The isolated multi-specific antibody or fragment thereof as defined in any one of claims 2312 to 3715 for use in the treatment of cancer, an infectious disease or an inflammatory disease.