

Claims

1. An antibody molecule that binds to programmed death-ligand 1 (PD-L1) and CD137, comprising
 - 5 (a) a complementarity determining region (CDR)-based antigen-binding site for PD-L1; and
 - (b) a CD137 antigen-binding site located in a CH3 domain of the antibody molecule;

wherein the CDR-based antigen-binding site comprises the VH CDR1, VH CDR2, VH CDR3, VL CDR1, VL CDR2, and VL CDR3, defined according to the Kabat numbering scheme, set forth in:

 - 10 (i) SEQ ID NOs: **1, 2, 3, 4, 5** and **6**, respectively [**E12v2**];
 - (ii) SEQ ID NOs: **1, 2, 3, 18, 19** and **20**, respectively [**E05v2**]; or
 - (iii) SEQ ID NOs: **1, 2, 3, 18, 19** and **29**, respectively [**G12v2**]; or

wherein the CDR-based antigen-binding site comprises the VH CDR1, VH CDR2, VH CDR3, VL CDR1, VL CDR2, and VL CDR3, defined according to the ImMunoGeneTics (IMGT)

 - 15 numbering scheme, set forth in:
 - (iv) SEQ ID NOs: **7, 8, 9, 10, 11** and **6**, respectively [**E12v2**];
 - (v) SEQ ID NOs: **21, 8, 9, 22, 11** and **20**, respectively [**E05v2**]; or
 - (vi) SEQ ID NOs: **21, 8, 9, 22, 11** and **29**, respectively [**G12v2**]; and

wherein the CD137 antigen-binding site comprises a first sequence and a second

 - 20 sequence located in the AB and EF structural loops of the CH3 domain, respectively,

wherein the first and second sequence have the sequence set forth in SEQ ID NOs: **113** and **114** [**FS22-172-003**], or **79** and **80** [**FS22-53-008**], respectively.
2. The antibody molecule according to claim 1, wherein the antibody molecule
 - 25 comprises the VH domain and the VL domain set forth in:
 - (i) SEQ ID NOs: **12** and **14**, respectively [**E12v2**];
 - (ii) SEQ ID NOs: **23** and **25**, respectively [**E05v2**]; or
 - (iii) SEQ ID NOs: **23** and **30**, respectively [**G12v2**].
3. The antibody molecule according to claim 1 or 2, wherein the antibody molecule
 - 30 comprises:
 - (i) the VH CDR1, VH CDR2, VH CDR3, VL CDR1, VL CDR2, and VL CDR3, defined according to the Kabat numbering scheme, set forth in SEQ ID NOs: **1, 2, 3, 4, 5** and **6**, respectively [**E12v2**];

(ii) the VH CDR1, VH CDR2, VH CDR3, VL CDR1, VL CDR2, and VL CDR3, defined according to the IMGT numbering scheme, set forth in SEQ ID NOs: **7, 8, 9, 10, 11** and **6**, respectively [**E12v2**]; and/or

(iii) the VH domain and VL domain set forth in SEQ ID NOs: **12** and **14**,
5 respectively [**E12v2**].

4. The antibody molecule according to any one of the preceding claims, wherein:

(i) the first sequence is located between positions 14 and 17 of the CH3 domain of the antibody molecule; and/or

10 (ii) wherein the second sequence is located between positions 91 and 99 of the CH3 domain of the antibody molecule; and
wherein the amino acid residue numbering is according to the IMGT numbering scheme.

15 5. The antibody molecule according to any one of the preceding claims, wherein the antibody molecule comprises the CH3 domain set forth in SEQ ID NO: **115 [FS22-172-003]** or SEQ ID NO: **81 [FS22-53-008]**.

6. The antibody molecule according to claim 5, wherein the CH3 domain sequence
20 further comprises a lysine residue (K) at the immediate C-terminus of the CH3 domain sequence.

7. The antibody molecule according to any one of the preceding claims, wherein the antibody molecule comprises the heavy chain and light chain of antibody:

- 25 (i) **FS22-172-003-AA/E12v2** set forth in SEQ ID NOs: **134** and **17**, respectively;
(ii) **FS22-172-003-AA/E05v2** set forth in SEQ ID NOs: **137** and **28**, respectively;
(iii) **FS22-172-003-AA/G12v2** set forth in SEQ ID NOs: **140** and **33**, respectively;
(iv) **FS22-053-008-AA/E12v2** set forth in SEQ ID NOs: **143** and **17**, respectively;
(v) **FS22-053-008-AA/E05v2** set forth in SEQ ID NOs: **146** and **28**, respectively; or
30 (vi) **FS22-053-008-AA/G12v2** set forth in SEQ ID NOs: **149** and **33**, respectively.

8. The antibody molecule according to any one of the preceding claims, wherein the antibody molecule comprises the heavy chain and light chain set forth in SEQ ID NOs: **134** and **17**, respectively [**FS22-172-003-AA/E12v2**].

9. The antibody molecule according to claim 8, wherein the CH3 domain in the heavy chain sequence comprises a lysine residue (K) at the immediate C-terminus of the CH3 domain sequence.
- 5 10. The antibody molecule according to any one of the preceding claims, wherein the antibody molecule comprises a CH2 domain, and wherein:
- (i) the antibody molecule has been modified to reduce or abrogate binding of the CH2 domain of the antibody molecule to one or more Fcγ receptors;
- 10 (ii) the antibody molecule does not bind to one or more Fcγ receptors; and/or
- (iii) binding of the antibody molecule to CD137 on an immune cell and to tumour cell surface-bound PD-L1 causes clustering of CD137 on the immune cell.
- 15 11. A nucleic acid molecule or molecules encoding the antibody molecule according to any one of the preceding claims.
12. A vector or vectors comprising the nucleic acid molecule or molecules according to claim 11.
- 20 13. A recombinant host cell comprising the nucleic acid molecule(s) according to claim 11, or the vector(s) according to claim 12.
- 25 14. A method of producing the antibody molecule according to any one of claims 1 to 10 comprising culturing the recombinant host cell of claim 13 under conditions for production of the antibody molecule, optionally further comprising isolating and/or purifying the antibody molecule.
- 30 15. A pharmaceutical composition comprising the antibody molecule according to any one of claims 1 to 10 and a pharmaceutically acceptable excipient.
16. A pharmaceutical composition for the treatment of cancer in an individual, comprising the antibody molecule according to any one of claims 1 to 10.