

costimulates T cell activities. CD137 ligand can also be expressed as a transmembrane protein on the cell surface and transmit signals into the cells on which it is expressed (reverse signaling) (Herbert Schwarz et al. J. Leukoc. Biol.89: 21–29; 2011).

[0005] Previous studies indicated that CD137L gene delivery into multiple mouse tumor models can enable the host mice to develop long-term immunity against wild-type tumors (Melero *et al.* Eur. J. Immunol. 1998 Mar;28(3):1116-21), prevent tumor formation or induce tumor regression from the transfectants (Guinn *et al.* J Immunol. 1999 Apr 15;162(8):5003-10; Xiang Cancer Biother. Radiopharm. 1999 Oct;14(5):353-61), or improve host survival (Martinet *et al.* J Natl Cancer Inst. 2000 Jun 7;92(11):931-6). These results suggest that CD137L expression may modify the tumor cells for whole cell vaccination by improving their ability to act as APCs for their tumor antigens, with the costimulatory CD137L molecules providing an abundance of signal two.

[0006] It is thought that CD137L expression may be useful, *e.g.*, in selecting patients for cancer treatments (such as treatment with an anti-CD137 antibody). However, this depends on the ability to detect CD137L in a sample (*e.g.*, an IHC sample, such as from a patient) with high confidence, robustness, and accuracy. As such, there is a need for anti-CD137L antibodies that allow for highly sensitive and robust detection of CD137L expression in a sample.

[0007] All references cited herein, including patent applications, patent publications, and UniProtKB/Swiss-Prot Accession numbers are herein incorporated by reference in their entirety, as if each individual reference were specifically and individually indicated to be incorporated by reference.

~~BRIEF~~ SUMMARY

[0008] To meet the above and other needs, disclosed herein are anti-CD137L antibodies that specifically bind the intracellular and/or transmembrane domains of human CD137L. Since the extracellular domain of CD137L is known to be subject to cleavage/shedding in tissues, it is thought that detection of CD137L via the intracellular or transmembrane domain may provide a more accurate assessment of CD137L expression in a tissue, *e.g.*, from a tumor.

As such, the present disclosure provides anti-CD137L antibodies that bind the intracellular and/or transmembrane domains of human CD137L with high sensitivity and robustness, thereby enabling their use in detection of CD137L in a fixed sample (*e.g.*, using IHC). Moreover, this detection may be used to inform treatment decisions, *e.g.*, to determine whether a patient's tumor may be responsive to treatment with an anti-CD137 antibody.

[0009] Accordingly, in one [aspectexample](#), provided herein are antibodies (*e.g.*, isolated antibodies) or antigen-binding fragments thereof that bind to an intracellular or transmembrane region of human CD137 ligand (CD137L). In some [embodimentexamples](#), the antibody or antigen-binding fragment binds to a peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARACRVLP (SEQ ID NO:1). In some [embodimentexamples](#), the antibody or antigen-binding fragment binds to a peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARA (SEQ ID NO:2). In some [embodimentexamples](#), the antibody or antigen-binding fragment binds to a peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARACRVLP (SEQ ID NO:1) and binds to a peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARA (SEQ ID NO:2). In some [embodimentexamples](#), the antibody or antigen-binding fragment binds to the extracellular domain of human CD137L. In some [embodimentexamples](#), the antibody or antigen-binding fragment binds to an intracellular domain or non-transmembrane region of human CD137L.

[0009a] In one aspect, the present disclosure refers to an isolated antibody, or antigen-binding fragment thereof, that binds to an intracellular or transmembrane region of human CD137 ligand (CD137L), wherein the antibody or antigen-binding fragment binds to a peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARACRVLP (SEQ ID NO:1) and/or binds to a peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARA (SEQ ID NO:2).

[0010] In some [embodimentexamples](#), the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARACRVLP (SEQ ID NO:1) is less than 50 amino acids in length. In some [embodimentexamples](#), the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARA (SEQ ID NO:2) is less than 50 amino acids in length. In some [embodimentexamples](#), the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARACRVLP (SEQ ID NO:1) is less than 50 amino acids in length, and the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARA (SEQ ID NO:2) is less than 50 amino acids in length. In some [embodimentexamples](#), the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARACRVLP (SEQ ID NO:1) does not comprise the extracellular domain of CD137L, or a portion thereof. In some [embodimentexamples](#), the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARA (SEQ ID NO:2)

does not comprise the extracellular domain of CD137L, or a portion thereof. In some [embodimentexamples](#), the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARACRVLP (SEQ ID NO:1) and the peptide comprising the amino acid sequence of MEYASDASLDPEAPWPPAPRARA (SEQ ID NO:2) do not comprise the extracellular domain of CD137L, or a portion thereof. In some [embodimentexamples](#), wherein the antibody or antigen-binding fragment binds to a Chinese hamster ovary (CHO) cell that expresses human CD137L. In some [embodimentexamples](#), the antibody or antigen-binding fragment binds to human CD137L in a fixed human tissue sample, *e.g.*, a formalin-fixed paraffin-embedded (FFPE) sample. In some [embodimentexamples](#), the sample is from human tonsil tissue or from human tumor tissue.

[0011] In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising an amino acid sequence according to Formula (I): $LX_1TX_2GVGVX_3WI$, wherein X_1 is S, N, or T; wherein X_2 is S, A, G, or T; and wherein X_3 is S, T, A, or G (SEQ ID NO:346); an HVR-H2 comprising an amino acid sequence according to Formula (II): $X_1X_2X_3IDX_4X_5X_6X_7X_8YYX_9PSX_{10}KSX_{11}L$, wherein X_1 is L or I; wherein X_2 is A or G; wherein X_3 is L, V, or I; wherein X_4 is W, H, or Y; wherein X_5 is A or S; wherein X_6 is G or D; wherein X_7 is D, Y, A, or S; wherein X_8 is K or T; wherein X_9 is S or N; wherein X_{10} is L or P; and wherein X_{11} is R or H (SEQ ID NO:347); and an HVR-H3 comprising an amino acid sequence according to Formula (III): $ARYGX_1X_2X_3YAX_4DY$, wherein X_1 is Y, V, W, L, or G; wherein X_2 is S, G, R, D, or N; wherein X_3 is S, G, or N; and wherein X_4 is I, L, or M (SEQ ID NO:348); and/or wherein the light chain variable region comprises an HVR-L1 comprising an amino acid sequence according to Formula (IV): $RX_1SQX_2X_3X_4X_5X_6X_7LA$, wherein X_1 is A or T; wherein X_2 is S, T, or G; wherein X_3 is V or I; wherein X_4 is R, S, or H; wherein X_5 is G or N; wherein X_6 is S, N, or T; and wherein X_7 is Y or F (SEQ ID NO:349); an HVR-L2 comprising an amino acid sequence according to Formula (V): $X_1AX_2X_3LX_4SGV$, wherein X_1 is A or D; wherein X_2 is S or F; wherein X_3 is T or S; and wherein X_4 is Q or E (SEQ ID NO:350); and an HVR-L3 comprising an amino acid sequence according to Formula (VI): $YCQQYX_1SX_2WT$, wherein X_1 is S, G, or N and wherein X_2 is L, Y, S, W or F (SEQ ID NO:351). In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a

light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:4, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:5, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:6, and/or the light chain variable region comprises an HVR-L1 comprising the amino acid sequence of SEQ ID NO:7, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:8, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:9. In some embodimentexamples, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:10, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:11, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:12, and/or the light chain variable region comprises an HVR-L1 comprising the amino acid sequence of SEQ ID NO:13, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:14, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:15. In some embodimentexamples, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:16, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:17, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:18, and/or the light chain variable region comprises an HVR-L1 comprising the amino acid sequence of SEQ ID NO:19, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:20, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:21. In some embodimentexamples, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:22, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:23, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:24, and/or the light chain variable region comprises an HVR-L1 comprising the amino acid sequence of SEQ ID NO:25, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:26, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:27. In some embodimentexamples, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:28, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:29, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:30, and/or the light chain variable region comprises an HVR-L1 comprising the amino

acid sequence of SEQ ID NO:31, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:32, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:33. In some embodimentexamples, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:34, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:35, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:36, and/or the light chain variable region comprises an HVR-L1 comprising the amino acid sequence of SEQ ID NO:37, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:38, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:39. In some embodimentexample, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:40, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:41, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:42, and/or the light chain variable region comprises an HVR-L1 comprising the amino acid sequence of SEQ ID NO:43, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:44, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:45. In some embodimentexamples, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:46, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:47, and an HVR-H3 comprising the amino acid sequence of SEQ ID NO:48, and/or the light chain variable region comprises an HVR-L1 comprising the amino acid sequence of SEQ ID NO:49, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:50, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:51. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:68, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:116, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:164, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:228, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:69, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:117, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:165, an HVR-L1 comprising the amino acid sequence of

SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:228, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:233. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:70, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:118, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:166, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:228, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:233. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:71, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:119, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:167, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:228, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:234. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:72, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:120, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:168, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:235. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:73, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:121, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:169, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:74, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:122, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:170, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:214, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:236. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:75, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:123, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:171, an HVR-L1

comprising the amino acid sequence of SEQ ID NO:215, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:76, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:124, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:172, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:235. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:77, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:125, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:173, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:235. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:78, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:126, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:174, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:216, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:79, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:127, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:175, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:217, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:80, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:128, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:176, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:238. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:81, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:129, an HVR-H3 comprising the amino

acid sequence of SEQ ID NO:177, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:217, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some embodiment examples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:82, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:130, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:178, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some embodiment examples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:83, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:131, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:179, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some embodiment examples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:84, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:132, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:180, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:218, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:239. In some embodiment examples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:85, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:133, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:181, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some embodiment examples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:86, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:134, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:182, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some embodiment examples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:87, an HVR-H2 comprising the amino acid sequence of SEQ ID

NO:135, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:183, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:240. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:88, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:136, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:184, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:217, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:89, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:137, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:185, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:219, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:90, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:138, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:186, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:91, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:139, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:187, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:220, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:228, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:233. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:92, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:140, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:188, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:217, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:93, an HVR-H2

comprising the amino acid sequence of SEQ ID NO:141, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:189, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:94, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:142, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:190, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:95, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:143, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:191, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:235. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:96, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:144, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:192, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:97, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:145, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:193, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:221, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:230, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:98, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:146, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:194, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:222, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid

sequence of SEQ ID NO:99, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:147, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:195, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:223, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:100, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:148, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:196, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:223, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:101, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:149, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:197, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:224, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:102, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:150, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:198, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:240. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:103, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:151, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:199, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:223, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some [embodimentexamples](#), the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:104, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:152, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:200, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:223, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:240. In some [embodimentexamples](#), the anti-CD137L antibody

comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:105, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:153, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:201, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:240. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:106, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:154, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:202, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:225, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:238. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:107, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:155, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:203, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:226, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:234. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:108, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:156, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:204, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:221, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:109, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:157, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:205, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:219, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:110, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:158, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:206, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:227, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some

embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:111, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:159, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:207, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:217, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:112, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:160, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:208, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:231, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:235. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:113, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:161, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:209, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:212, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:237. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:114, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:162, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:210, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:213, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:240. In some embodimentexamples, the anti-CD137L antibody comprises an HVR-H1 comprising the amino acid sequence of SEQ ID NO:115, an HVR-H2 comprising the amino acid sequence of SEQ ID NO:163, an HVR-H3 comprising the amino acid sequence of SEQ ID NO:211, an HVR-L1 comprising the amino acid sequence of SEQ ID NO:217, an HVR-L2 comprising the amino acid sequence of SEQ ID NO:229, and an HVR-L3 comprising the amino acid sequence of SEQ ID NO:232.

[0012] In some embodimentexamples, the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:52, and/or the light chain variable region comprises the amino acid

sequence of SEQ ID NO:53. In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:54, and/or the light chain variable region comprises the amino acid sequence of SEQ ID NO:55. In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:56, and/or the light chain variable region comprises the amino acid sequence of SEQ ID NO:57. In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:58, and/or the light chain variable region comprises the amino acid sequence of SEQ ID NO:59. In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:60, and/or the light chain variable region comprises the amino acid sequence of SEQ ID NO:61. In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:62, and/or the light chain variable region comprises the amino acid sequence of SEQ ID NO:63. In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:64, and/or the light chain variable region comprises the amino acid sequence of SEQ ID NO:65. In some [embodimentexamples](#), the antibody comprises a heavy chain variable region and a light chain variable region, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO:66, and/or the light chain variable region comprises the amino acid sequence of SEQ ID NO:67. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:241 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:242. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:241 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:242. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:243 and/or 1, 2, or 3 HVR sequences from a VL region

comprising the amino acid sequence of SEQ ID NO:244. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:243 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:244. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:245 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:246. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:245 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:246. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:247 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:248. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:247 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:248. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:249 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:250. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:249 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:250. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:251 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:252. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:251 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:252. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:253 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:254. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:253

and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:254. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:255 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:256. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:255 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:256. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:257 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:258. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:257 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:258. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:259 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:260. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:259 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:260. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:261 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:262. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:261 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:262. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:263 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:264. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:263 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:264. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH

region comprising the amino acid sequence of SEQ ID NO:265 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:266. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:265 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:266. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:267 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:268. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:267 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:268. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:269 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:270. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:269 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:270. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:271 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:272. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:271 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:272. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:273 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:274. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:273 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:274. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:275 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:276. In some [embodimentexamples](#), the anti-

CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:275 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:276. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:277 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:278. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:277 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:278. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:279 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:280. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:279 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:280. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:281 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:282. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:281 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:282. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:283 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:284. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:283 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:284. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:285 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:286. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:285 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID

NO:286. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:287 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:288. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:287 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:288. In some [embodimentexample](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:289 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:290. In some [embodimentexample](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:289 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:290. In some [embodimentexample](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:291 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:292. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:291 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:292. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:293 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:294. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:293 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:294. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:295 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:296. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:295 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:296. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:297 and/or 1, 2, or 3 HVR

sequences from a VL region comprising the amino acid sequence of SEQ ID NO:298. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:297 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:298. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:299 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:300. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:299 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:300. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:301 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:302. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:301 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:302. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:303 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:304. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:303 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:304. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:305 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:306. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:305 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:306. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:307 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:308. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid

sequence of SEQ ID NO:307 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:308. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:309 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:310. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:309 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:310. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:311 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:312. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:311 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:312. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:313 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:314. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:313 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:314. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:315 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:316. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:315 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:316. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:317 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:318. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:317 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:318. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR

sequences from a VH region comprising the amino acid sequence of SEQ ID NO:319 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:320. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:319 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:320. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:321 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:322. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:321 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:322. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:323 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:324. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:323 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:324. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:325 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:326. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:325 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:326. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:327 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:328. In some [embodimentexamples](#), the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:327 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:328. In some [embodimentexamples](#), the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:329 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:330. In some

embodimentexamples, the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:329 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:330. In some embodimentexample, the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:331 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:332. In some embodimentexample, the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:331 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:332. In some embodimentexample, the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:333 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:334. In some embodimentexample, the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:333 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:334. In some embodimentexample, the anti-CD137L antibody comprises 1, 2, or 3 HVR sequences from a VH region comprising the amino acid sequence of SEQ ID NO:335 and/or 1, 2, or 3 HVR sequences from a VL region comprising the amino acid sequence of SEQ ID NO:336. In some embodimentexample, the anti-CD137L antibody comprises a heavy chain variable (VH) region comprising the amino acid sequence of SEQ ID NO:335 and/or a light chain variable (VL) region comprising the amino acid sequence of SEQ ID NO:336.

[0013] In some embodimentexamples, the antibody comprises a non-human Fc region. In some embodimentexamples, the antibody comprises a mouse Fc region. In some embodimentexamples, the antibody comprises a mouse IgG2a Fc region.

[0014] In another aspectexample, provided herein are polynucleotides (*e.g.*, isolated polynucleotides) encoding the antibody or antigen-binding fragment according to any one of the above embodimentexamples. Also provided herein are vectors (*e.g.*, expression vectors) comprising any of the polynucleotides according to any one of the above embodimentexamples. Also provided herein are host cells (*e.g.*, isolated host cells) comprising a polynucleotide or vector according to any one of the above embodimentexamples. Also provided herein are methods of making or producing an antibody or antigen-binding fragment thereof, comprising culturing a host cell

according to any one of the above [embodimentexamples](#) under conditions suitable for producing the antibody or antigen-binding fragment. In some [embodimentexamples](#), the methods further comprise recovering the antibody or antigen-binding fragment produced by the cell.

[0014a] In one aspect, the present disclosure refers to a polynucleotide encoding the antibody or antigen-binding fragment disclosed herein.

[0014b] In one aspect, the present disclosure refers to a vector comprising the polynucleotide disclosed herein.

[0014c] In one aspect, the present disclosure refers to a host cell comprising the vector disclosed herein.

[0014d] In one aspect, the present disclosure refers to a method of making an antibody or antigen-binding fragment, comprising culturing the host cell disclosed herein under conditions suitable for producing the antibody or antigen-binding fragment.

[0015] In another [aspectexample](#), provided herein are methods of detecting a level of expression of human CD137L in a sample. In some [embodimentexamples](#), the methods comprise: contacting a human tissue sample with an antibody or antigen-binding fragment according to any one of the above [embodimentexamples](#); and detecting binding of the antibody or antigen-binding fragment to the sample, wherein binding of the antibody or antigen-binding fragment to the sample (e.g., a level of binding of the antibody or antigen-binding fragment to the sample) indicates the level of expression of human CD137L in the sample. In some [embodimentexamples](#), binding of the antibody or antigen-binding fragment to the sample is detected in (c) by immunohistochemistry (IHC). In another [aspectexample](#), provided herein are methods of treating or delaying progression of cancer in a subject in need thereof. In some [embodimentexamples](#), the methods comprise: obtaining a human tissue sample from the individual; measuring level of expression of CD137L in the sample using an antibody or antigen-binding fragment according to any one of the above [embodimentexamples](#); and if the level of expression of CD137L in the sample is lower than a reference level, administering an effective amount of an anti-CD137 antibody to the individual. In some [embodimentexamples](#) according to any of the [embodimentexamples](#) described herein, the methods further comprise obtaining a human tissue sample. In some [embodimentexamples](#), the methods comprise administering an effective amount of an anti-CD137 antibody to an individual, wherein level of expression of CD137L has been detected in a sample obtained from the individual using an antibody or antigen-binding fragment according to any one of the above [embodimentexamples](#). In some [embodimentexamples](#), the level of expression of CD137L in the sample is measured using IHC. In some [embodimentexamples](#), the level of expression of CD137L in the sample is below the limit of detection. In some [embodimentexample](#), the sample is a fixed sample. In some [embodimentexamples](#), the sample is a formalin-fixed paraffin-embedded (FFPE) sample. In some [embodimentexamples](#), the sample is a tumor biopsy sample. In some [embodimentexamples](#), the sample is a liquid tumor sample. In some [embodimentexamples](#), the sample comprises one or more cancer cells. In some [embodimentexamples](#), the sample is a tumor sample from the cancer of the individual. In some [embodimentexamples](#), the level of expression of CD137L is the level of expression of CD137L by cancer cells. In some

embodimentexamples, the methods further comprise administering to the subject a therapeutically effective amount of at least one additional therapeutic agent. In some **embodimentexamples**, the at least one additional therapeutic agent is selected from the group consisting of viral gene therapy, immune checkpoint inhibitor, target therapy, radiation therapy, and chemotherapy. In some **embodimentexamples**, the at least one additional therapeutic agent is selected from the group consisting of pomalyst, revlimid, lenalidomide, pomalidomide, thalidomide, a DNA-alkylating platinum-containing derivative, cisplatin, 5-fluorouracil, cyclophosphamide, an anti-CTLA4 antibody, an anti-PD-1 antibody, an anti-PD-L1 antibody, an anti-CD20 antibody, an anti-CD40 antibody, an anti-DR5 antibody, an anti-CD1d antibody, an anti-TIM3 antibody, an anti-SLAMF7 antibody, an anti-KIR receptor antibody, an anti-OX40 antibody, an anti-HER2 antibody, an anti-ErbB-2 antibody, an anti-EGFR antibody, cetuximab, rituximab, trastuzumab, pembrolizumab, radiotherapy, single dose radiation, fractionated radiation, focal radiation, whole organ radiation, IL-12, IFN α , GM-CSF, a chimeric antigen receptor, adoptively transferred T cells, an anti-cancer vaccine, and an oncolytic virus.

[0015a] In one aspect, the present disclosure refers to a method of detecting a level of expression of human CD137L in a sample, the method comprising: (a) contacting a human tissue sample with the antibody or antigen-binding fragment disclosed herein; and (b) detecting binding of the antibody or antigen-binding fragment to the sample, wherein binding of the antibody or antigen-binding fragment to the sample indicates the level of expression of human CD137L in the sample.

[0015b] In one aspect, the present disclosure refers to use of an anti-CD137 antibody in the manufacture of a medicament for treating or delaying progression of cancer in a subject in need thereof, the use comprising: (a) measuring level of expression of CD137L in a sample obtained from the subject using the antibody disclosed herein; and (b) if the level of expression of CD137L in the sample is lower than a reference level, an effective amount of the medicament is to be administered to the subject.

[0016] It is to be understood that one, some, or all of the properties of the various **embodimentexamples** described above and herein may be combined to form other **embodimentexamples** of the present disclosure. These and other **aspectexamples** of the present disclosure will become apparent to one of skill in the art. These and other **embodimentexamples** of the present disclosure are further described by the detailed description that follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] **FIG. 1** shows high specificity of CD137L binding by purified anti-CD137L antibodies (as indicated), as measured by ELISA assays using CD137L peptides 01 and 02, as well as four other peptides as negative controls.

[0018] **FIGS. 2A-2D** show a comparison of binding specificity between TY23561 and the commercial Reference-1 antibody. Binding to a CHO-S cell line stably overexpressing human CD137L (CHO-S-CD137L) or to parental CHO-S cells was assayed by flow cytometry. The positive control cell CHO-S-CD137L and the negative control CHO-S cells were washed, fixed and permeabilized in a similar fashion as in immunohistochemistry, followed by analysis through Beckman CytoFlex. **(FIG. 2A)** Anti-CD137L antibody TY23561 (0.4 nM or 2 nM)