CLAIMS

1. An antibody drug conjugate of the formula

$$Ab\text{-}(L\text{-}(D)_m)_n$$

or a pharmaceutically acceptable salt thereof; wherein
Ab is an antibody or antigen binding fragment thereof that comprises (i) a heavy chain variable region that comprises (a) a HCDR1 (CDR-Complementarity Determining Region) of SEQ ID NO: 76, (b) a HCDR2 of SEQ ID NO: 77, (c) a HCDR3 of SEQ ID NO: 78; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 85, (e) a LCDR2 of SEQ ID NO: 86, and (f) a LCDR3 of SEQ ID NO: 87; that specifically binds to an epitope of human cKIT at domains 1-3 (SEQ ID NO.155);
L is a linker;
D is a drug moiety;
m is an integer from 1 to 8; and
n is an integer from 1 to 10.

2. The antibody drug conjugate of claim 1, wherein said n is 3 or 4.

3. The antibody drug conjugate of claim 1 or 2, wherein said antibody or antigen binding fragment thereof specifically binds human cKIT at SEQ ID NO. 161 and SEQ ID NO. 162.

4. The antibody drug conjugate of any of the preceding claims in which one or two amino acids within a CDR have been modified, deleted or substituted.

5. The antibody drug conjugate of any of the preceding claims that retains at least 90, 91, 92, 93, 94, 95, 96, 97, 98 or 99% identity over either the variable light or variable heavy region.

6. The antibody drug conjugate of any of the preceding claims wherein the antibody is a monoclonal antibody, a chimeric antibody, a humanized antibody, a human engineered antibody, a human antibody, a single chain antibody(scFv) or an antibody fragment.

7. The antibody drug conjugate of any one of claims 1-6, wherein said linker (L) is selected from the group consisting of a cleavable linker, a non-cleavable linker, a hydrophilic linker, a procharged linker and a dicarboxylic acid based linker.

8. The antibody drug conjugate of claim 7, wherein the linker is derived from a cross-linking reagent selected from the group consisting of N-succinimidyl-3-(2-pyridyldithio)propionate (SPDP), N-succinimidyl 4-(2-pyridyldithio)pentanoate (SPP), N-succinimidyl 4-(2-pyridyldithio)butanoate (SPDB),

N-succinimidyl-4-(2-pyridyldithio)2-sulfo-butanoate (sulfo-SPDB), N-succinimidyl iodoacetate (SIA), N-succinimidyl(4-iodoacetyl)aminobenzoate (SIAB), maleimide PEG NHS, N-succinimidyl 4-(maleimidomethyl) cyclohexanecarboxylate (SMCC), N- sulfosuccinimidyl 4-(maleimidomethyl) cyclohexanecarboxylate (sulfo-SMCC) or 2,5-dioxopyrrolidin-1-yl 17-(2,5-dioxo-2,5-dihydro-1H-pyrrol-1-yl)-5,8,11,14-tetraoxo-4,7,10,13-tetraazaheptadecan-1-oate (CX1-1).

9. The antibody drug conjugate of claim 8, wherein said linker is derived from the cross-linking reagent N-succinimidyl 4-(maleimidomethyl) cyclohexanecarboxylate (SMCC).

10. The antibody drug conjugate of any one of claims 1-9, wherein said drug moiety (D) is selected from a group consisting of a V-ATPase inhibitor, a pro-apoptotic agent, a Bcl2 inhibitor, an MCL1 inhibitor, a HSP90 inhibitor, an IAP inhibitor, an mTor inhibitor, a microtubule stabilizer, a microtubule destabilizer, an auristatin, a dolastatin, a maytansinoid, a MetAP (methionine aminopeptidase), an inhibitor of nuclear export of proteins CRM1, a DPPIV inhibitor, proteasome inhibitors, inhibitors of phosphoryl transfer reactions in mitochondria, a protein synthesis inhibitor, a kinase inhibitor, a CDK2 inhibitor, a CDK9 inhibitor, a kinesin inhibitor, an HDAC inhibitor, a DNA damaging agent, a DNA alkylating agent, a DNA intercalator, a DNA minor groove binder and a DHFR inhibitor.

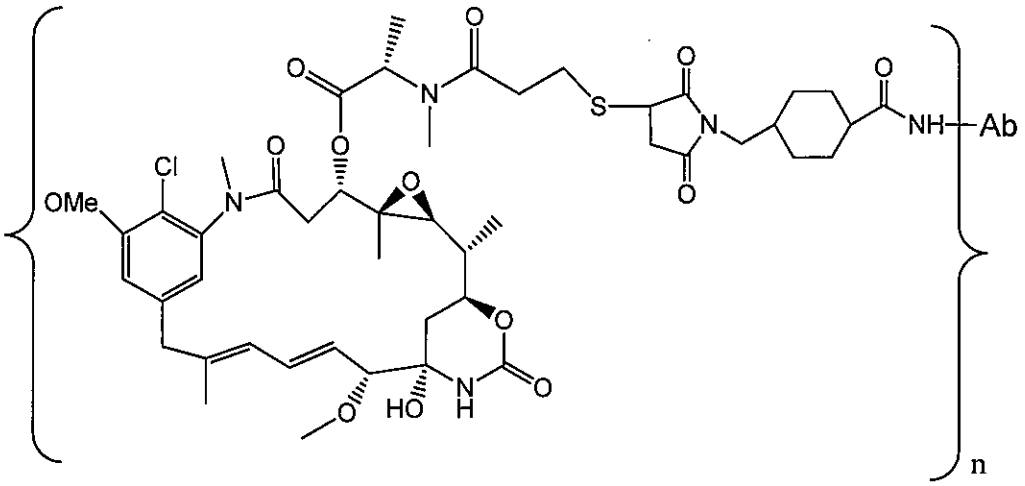
11. The antibody drug conjugate of claim 10, wherein the drug moiety is a maytansinoid.

12. The antibody drug conjugate of claim 11, wherein the maytansinoid is N(2')- deacetyl-N(2')-(3-mercapto-1-oxopropyl)-maytansine (DM1) or N(2')-deacetyl-N2-(4- mercapto-4-methyl- 1 -oxopentyl)-maytansine (DM4).

13. The antibody drug conjugate of any of the preceding claims in combination with another therapeutic agent.

14. The antibody drug conjugate of any of the preceding claims in combination with a therapeutic agent listed in Table 16.

15. An antibody drug conjugate of the formula



or a pharmaceutically acceptable salt thereof; wherein;

Ab is an antibody or antigen binding fragment thereof that specifically binds to human cKIT comprising: (i) a heavy chain variable region that comprises (a) a HCDR1 (CDR-Complementarity Determining Region) of SEQ ID NO: 76, (b) a HCDR2 of SEQ ID NO: 77, (c) a HCDR3 of SEQ ID NO: 78; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 85, (e) a LCDR2 of SEQ ID NO: 86, and (f) a LCDR3 of SEQ ID NO: 87;

(ii) a heavy chain variable region that comprises (a) a HCDR1 of SEQ ID NO: 22, (b) a HCDR2 of SEQ ID NO: 23, (c) a HCDR3 of SEQ ID NO: 24; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 31, (e) a LCDR2 of SEQ ID NO: 32, and (f) a LCDR3 of SEQ ID NO: 33;

(iii) a heavy chain variable region that comprises (a) a HCDR1 of SEQ ID NO: 130, (b) a HCDR2 of SEQ ID NO: 131, (c) a HCDR3 of SEQ ID NO: 132; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 139, (e) a LCDR2 of SEQ ID NO: 140, and (f) a LCDR3 of SEQ ID NO: 141;

(iv) a heavy chain variable region that comprises: (a) a HCDR1 of SEQ ID NO: 58, (b) a HCDR2 of SEQ ID NO: 59, (c) a HCDR3 of SEQ ID NO: 60; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 67, (e) a LCDR2 of SEQ ID NO: 68, and (f) a LCDR3 of SEQ ID NO: 69;

(v) a heavy chain variable region that comprises: (a) a HCDR1 of SEQ ID NO: 40, (b) a HCDR2 of SEQ ID NO: 41, (c) a HCDR3 of SEQ ID NO: 42; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 49, (e) a LCDR2 of SEQ ID NO: 50, and (f) a LCDR3 of SEQ ID NO: 51;

(vi) a heavy chain variable region that comprises: (a) a HCDR1 of SEQ ID NO: 94, (b) a HCDR2 of SEQ ID NO: 95, (c) a HCDR3 of SEQ ID NO: 96; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 103, (d) a LCDR2 of SEQ ID NO: 104, and (f) a LCDR3 of SEQ ID NO: 105;

(vii) a heavy chain variable region that comprises: (a) a HCDR1 of SEQ ID NO: 112, (b) a HCDR2 of SEQ ID NO: 113, (c) a HCDR3 of SEQ ID NO: 114; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 121, (e) a LCDR2 of SEQ ID NO: 122, and (f) a LCDR3 of SEQ ID NO: 123; or

(viii) a heavy chain variable region that comprises: (a) a HCDR1 of SEQ ID NO: 3, (b) a HCDR2 of SEQ ID NO: 4, (c) a HCDR3 of SEQ ID NO: 5; and a light chain variable region that comprises: (d) a LCDR1 of SEQ ID NO: 12, (e) a LCDR2 of SEQ ID NO: 13, and (f) a LCDR3 of SEQ ID NO: 14;

at domains 1-3 (SEQ ID NO.155), and n is an integer from 1 to 10.

16. The antibody drug conjugate of claims 15 in which one or two amino acids within a CDR have been modified, deleted or substituted.

17. The antibody drug conjugate of claims 15 that retains at least 90, 91, 92, 93, 94, 95, 96, 97, 98 or 99% identity over either the variable light or variable heavy region.

18. The antibody drug conjugate of claims 15 , wherein the antibody is a monoclonal antibody, a chimeric antibody, a humanized antibody, a human engineered antibody, a human antibody, a single chain antibody(scFv) or an antibody fragment.

19. The antibody drug conjugate of claims 15-17, wherein said n is an integer from 2 to 8.

20. The antibody drug conjugate of claims15-17, wherein said n is an integer from 3 to 4.

21. The antibody drug conjugate of claims 15-20 in combination with another therapeutic agent.

22. The antibody drug conjugate of claims 15-20 in combination with a therapeutic agent listed in Table 16.

23. A pharmaceutical composition comprising the antibody drug conjugate of claims 1 or 17 and a pharmaceutically acceptable carrier.