

CLAIMS

WHAT IS CLAIMED IS:

1. An isolated antibody or an antigen-binding fragment thereof, comprising:
 - a) heavy chain CDR sequences comprising SEQ ID NO: 1, SEQ ID NO: 3, and SEQ ID NO: 5; and kappa light chain CDR sequences comprising SEQ ID NO: 2, SEQ ID NO: 4, and SEQ ID NO: 6;
 - b) heavy chain CDR sequences comprising SEQ ID NO: 7, SEQ ID NO: 9, and SEQ ID NO: 11; and kappa light chain CDR sequences comprising SEQ ID NO: 8, SEQ ID NO: 10, and SEQ ID NO: 12;
 - c) heavy chain CDR sequences comprising SEQ ID NO: 13, SEQ ID NO: 15, and SEQ ID NO: 17; and kappa light chain CDR sequences comprising SEQ ID NO: 14, SEQ ID NO: 16, and SEQ ID NO: 18;
 - d) heavy chain CDR sequences comprising SEQ ID NO: 19, SEQ ID NO: 21, and SEQ ID NO: 23; and kappa light chain CDR sequences comprising SEQ ID NO: 20, SEQ ID NO: 22, and SEQ ID NO: 24;
 - e) heavy chain CDR sequences comprising SEQ ID NO: 25, SEQ ID NO: 27, and SEQ ID NO: 29; and kappa light chain CDR sequences comprising SEQ ID NO: 26, SEQ ID NO: 28, and SEQ ID NO: 30;
 - f) heavy chain CDR sequences comprising SEQ ID NO: 31, SEQ ID NO: 33, and SEQ ID NO: 35; and kappa light chain CDR sequences comprising SEQ ID NO: 32, SEQ ID NO: 34, and SEQ ID NO: 36;
 - g) heavy chain CDR sequences comprising SEQ ID NO: 37, SEQ ID NO: 39, and SEQ ID NO: 41; and kappa light chain CDR sequences comprising SEQ ID NO: 38, SEQ ID NO: 40, and SEQ ID NO: 42; or
 - h) heavy chain CDR sequences comprising SEQ ID NO: 43, SEQ ID NO: 45, and SEQ ID NO: 47; and kappa light chain CDR sequences comprising SEQ ID NO: 44, SEQ ID NO: 46, and SEQ ID NO: 48.
2. The antibody or an antigen-binding fragment thereof of claim 1, comprising:
 - a) a heavy chain variable region comprising SEQ ID NO: 81 and a kappa light chain variable region comprising SEQ ID NO: 83;
 - b) a heavy chain variable region comprising SEQ ID NO: 85 and a kappa light chain variable region comprising SEQ ID NO: 87;
 - c) a heavy chain variable region comprising SEQ ID NO: 89 and a kappa light chain

- variable region comprising SEQ ID NO: 91;
 - d) a heavy chain variable region comprising SEQ ID NO: 93 and a kappa light chain variable region comprising SEQ ID NO: 95;
 - e) a heavy chain variable region comprising SEQ ID NO: 97 and a kappa light chain variable region comprising SEQ ID NO: 99;
 - f) a heavy chain variable region comprising SEQ ID NO: 101 and a kappa light chain variable region comprising SEQ ID NO: 103;
 - g) a heavy chain variable region comprising SEQ ID NO: 105 and a kappa light chain variable region comprising SEQ ID NO: 107;
 - h) a heavy chain variable region comprising SEQ ID NO: 109 and a kappa light chain variable region comprising SEQ ID NO: 111;
 - i) a heavy chain variable region comprising SEQ ID NO: 113 and a kappa light chain variable region comprising SEQ ID NO: 115; or
 - j) a heavy chain variable region comprising SEQ ID NO: 117 and a kappa light chain variable region comprising SEQ ID NO: 119.
3. The antibody or antigen-binding fragment thereof of claim 1, further comprising an immunoglobulin constant region, optionally a constant region of IgG, optionally a constant region of human IgG1.
 4. The antibody or an antigen-binding fragment thereof of claim 1, which is a humanized antibody.
 5. The antibody or antigen-binding fragment thereof of claim 1, which is a camelized single domain antibody, a diabody, a scFv, an scFv dimer, a BsFv, a dsFv, a (dsFv)₂, a dsFv-dsFv', an Fv fragment, a Fab, a Fab', a F(ab')₂, a bispecific antibody, a ds diabody, a nanobody, a domain antibody, or a bivalent domain antibody.
 6. The antibody or an antigen-binding fragment thereof of claim 5, wherein the antibody or an antigen-binding fragment thereof is bispecific and has a first specificity for CD3epsilon, and a second specificity.
 7. The antibody or an antigen-binding fragment thereof of claim 6, wherein the second specificity is for a second antigen different from CD3epsilon wherein presence of the second antigen in proximity to a CD3epsilon-expressing T cells is desirable for the second antigen to be recognized by immune system.
 8. The antibody or antigen-binding fragment thereof of claim 1 linked to one or more conjugates, wherein the conjugate comprises a chemotherapeutic agent, a toxin, a radioactive isotope, a lanthanide, a luminescent label, a fluorescent label, or an enzyme-

substrate label.

9. The antibody or an antigen-binding fragment thereof of claim 1, capable of specifically binding to CD3epsilon, and optionally wherein the CD3epsilon are derived from mouse, rat, monkey or human, and optionally wherein the CD3epsilon is a recombinant CD3epsilon or a CD3epsilon expressed on a cell surface.
10. A pharmaceutical composition comprising the antibody or antigen-binding fragment thereof of claim 1, and a pharmaceutically acceptable carrier.
11. An isolated polynucleotide encoding the antibody or an antigen-binding fragment thereof of claim 1.
12. A vector comprising the isolated polynucleotide of claim 11.
13. A host cell comprising the vector of claim 12.
14. A method of expressing the antibody or antigen-binding fragment thereof of claim 1, comprising culturing a host cell comprising a vector comprising an isolated polynucleotide encoding the antibody or antigen-binding fragment thereof of claim 1 under the condition at which the vector is expressed
15. Use of an antibody or antigen-binding fragment thereof of claim 1 in the manufacture of a medicament for the treatment of CD3 related disease or condition.
16. The use of claim 15, wherein the antibody or antigen-binding fragment thereof is bispecific and the disease or condition is cancer.
17. A method of activating CD3epsilon-expressing T cells in vitro, comprising contacting the CD3epsilon-expressing T cells with the antibody or antigen-binding fragment thereof of claim 1.
18. A method of promoting in vitro processing of a second antigen by CD3epsilon -expressing T cell, comprising contacting the CD3epsilon-expressing T cells with the bispecific antibody or antigen-binding fragment thereof of claim 6, wherein the bispecific antibody or antigen-binding fragment is capable of specifically binding to both the CD3epsilon-expressing T cells and a second antigen thereby bringing both in close proximity.
19. A kit comprising the antibody or antigen-binding fragment thereof of claim 1, useful in detecting CD3epsilon, optionally recombinant CD3epsilon, CD3epsilon expressed on cell surface, or CD3epsilon-expressing cells, or useful in diagnosing a CD3 related disease or condition in a subject.