CLAIMS

1. An antigen binding protein comprising a first polypeptide comprising a variable domain V_A comprising complementarity determining regions (CDR) CDRa1, CDRa2 and CDRa3 and a second polypeptide comprising a variable domain V_B comprising CDRb1, CDRb2 and CDRb3, wherein
   1) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 80, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 82, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 85, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 87,
   2) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 24, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 133, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 75, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 136,
   3) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 24, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 63, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 66, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 68,
   4) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 90, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 92, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 66, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 96,
   5) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 2, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 4, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 8, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 10,
   6) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 53, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 55, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 58, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 60,
   7) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 71, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 72, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 75, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 77,
   8) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 99, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 101, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 75, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 104,

9) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 14, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 16, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 19, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 21,
10) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 107, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 109, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 112, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 114,
11) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 125, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 127, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 112, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 130, or
12) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 117, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 119, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 58, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 122,
13) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 24, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 35, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 38, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 40,
14) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 24, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 26, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 29, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 31, or
15) CDRa1 comprises or consists of the amino acid sequence of SEQ ID NO: 43, CDRa3 comprises or consists of the amino acid sequence of SEQ ID NO: 45, CDRb1 comprises or consists of the amino acid sequence of SEQ ID NO: 48, and CDRb3 comprises or consists of the amino acid sequence of SEQ ID NO: 50,

wherein the antigen binding protein comprises said CDRa1, CDRa3, CDRb1 and CDRb3 sequence(s) with not more than one, two or three amino acid mutations, wherein each of CDRa1, CDRa3, CDRb1 and/or CDRb3 may comprise one, two or three amino acid mutations.

2. The antigen binding protein of claim 1, wherein

CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 81, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 86

CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 25, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 76,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 25, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 67,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 91, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 95,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 3, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 9,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 54, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 59,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 15, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 76,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 100, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 76,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 15, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 20,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 108, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 113,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 126, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 113,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 118, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 59,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 25, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 39,
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 25, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 30, or
CDRa2 comprises or consists of the amino acid sequence of SEQ ID NO: 44, and CDRb2 comprises or consists of the amino acid sequence of SEQ ID NO: 49,
wherein the antigen binding protein comprises said CDRa2 and CDRb2 sequence(s) with not more than one, two, three or four amino acid mutations, wherein each of CDRa2 and/or CDRb2 may comprise one, two, three or four amino acid mutations.

3. The antigen binding protein of claim 1 or 2, specifically binding to a CT45 antigenic peptide that is in a complex with a major histocompatibility complex (MHC) protein, wherein the CT45 antigenic peptide consists of the amino acid sequence of SEQ ID NO: 138 (KIFEMLEGV).

4. The antigen binding protein of any one of claims 1to 3, wherein the antigen binding protein is a T Cell Receptor (TCR), preferably wherein the TCR is selected from the group consisting of an α/β TCR, a γ/δ TCR, a single chain TCR, a membrane-bound TCR, a soluble TCR, a monovalent, bivalent or multivalent TCR, a monospecific, bispecific or multispecific TCR, a functional fragment of a TCR, and a fusion protein or chimeric protein comprising a functional fragment of a TCR, more preferably wherein the TCR is an α/β TCR or a γ/δ TCR, most preferably an α/β TCR.

5. The antigen binding protein of any one of claims 1 to 4, wherein V_A comprises or consists of an amino acid sequence selected from the group consisting of SEQ ID NO: 79, 13, 132, 62, 89, 1, 52, 70, 98, 106, 124, 116, 34, 23, and 42, or an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 98% or 99% identity to SEQ ID NO: 79, 13, 132, 62, 89, 1, 52, 70, 98, 106, 124, 116, 34, 23, and 42 and comprising the CDRa1, CDRa2 and CDRa3 according to claim 1 or 2; and wherein V_B comprises or consists of an amino acid sequence selected from the group consisting of SEQ ID NO: 84, 18, 135, 65, 94, 7, 57, 74, 103, 111, 129, 121, 37, 28 and 47 or an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 98% or 99% identity to SEQ ID NO: 84, 18, 135, 65, 94, 7, 57, 74, 103, 111, 129, 121, 37, 28 and 47 and comprising the CDRb1, CDRb2 and CDRb3 according to claim 1 or 2, wherein the CDRa1, CDRa2, CDRa3, CDRb1, CDRb2 and/or CDRb3 sequences may comprise one, two or three amino acid mutations, preferably amino acid substitutions.

6. The antigen binding protein of any one of claims 1 to 5, wherein the first polypeptidefurther comprises a constant domain, wherein the constant domain comprises or consists of an amino acid sequence selected from the group consisting of SEQ ID NO: 751, 5, 750, 156, 11, 32 and 157, preferably selected from the group consisting of SEQ ID NO: 751, 5, 750, , 11 and 32, or an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 98% or 99% identity to SEQ ID NO: 5, 750, 751, 156, 11, 32 or 157, and the second polypeptide further comprises a constant domain, wherein the constant domain comprises or consists of an amino acid sequence selected from the group consisting of SEQ ID NO: 11, 5, 750, 156, 32 and 157, preferably selected from the group consisting of SEQ ID NO: 11, 751, 5, 750, and 32, or an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 98% or 99% identity to SEQ ID NO: 11, 5, 750, 751, 156, 32 or 157.

7. The antigen binding protein of any one of claims 1 to 6, wherein the first polypeptide comprises or consists of an amino acid sequence selected from the group consisting of SEQ ID NO: 83, 17, 134, 64, 93, 6, 56, 73, 102, 110, 128, 120, 36, 27, 46 and 158-172,

preferably selected from the group consisting of SEQ ID NO: 83, 17, 134, 64, 93, 6, 56, 73, 102, 110, 128, 120, 36, 27 and 46, or an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 98% or 99% identity to SEQ ID NO: 83, 17, 134, 64, 93, 6, 56, 73, 102, 110, 128, 120, 36, 27, 46, or 158-172, and the second polypeptide comprises or consists of an amino acid sequence selected from the group consisting of SEQ ID NO: 88, 22, 137, 69, 97, 12, 61, 78 105, 115, 131, 123, 41, 33, 51 and 173-187, preferably selected from the group consisting of SEQ ID NO: 88, 22, 137, 69, 97, 12, 61, 78 105, 115, 131, 123, 41, 33 and 51, or an amino acid sequence having at least 70%, 75%, 80%, 85%, 90%, 95%, 98% or 99% identity to SEQ ID NO: 88, 22, 137, 69, 97, 12, 61, 78 105, 115, 131, 123, 41, 33, 51 or 173-187.

8. The antigen binding protein of any one of claims 1 to 7, wherein the antigen binding protein does not significantly bind to at least one, at least 2, at least 3, at least 4, at least 5, or all similar peptides selected from the group consisting of SEQ ID NO: 146 (SP-05-0001), SEQ ID NO: 147 (SP-05-0002), SEQ ID NO: 148 (SP-05-0003), SEQ ID NO: 149 (SP-05-0004), SEQ ID NO: 150 (SP-05-0005), SEQ ID NO: 151 (SP-05-0006), SEQ ID NO: 152 (SP-05-0007), SEQ ID NO: 153 (SP-05-0008), SEQ ID NO: 154 (SP-05-0009) and SEQ ID NO: 155 (SP-05-0010), preferably from the group consisting of SEQ ID NO: 146 (SP-05-0001), SEQ ID NO: 147 (SP-05-0002), SEQ ID NO: 148 (SP-05-0003), SEQ ID NO: 150 (SP-05-0005), SEQ ID NO: 151 (SP-05-0006), SEQ ID NO: 152 (SP-05-0007), SEQ ID NO: 153 (SP-05-0008), SEQ ID NO: 154 (SP-05-0009) and SEQ ID NO: 155 (SP-05-0010), more preferably from the group consisting of SEQ ID NO: 147 (SP-05-0002), SEQ ID NO: 151 (SP-05-0006), SEQ ID NO: 152 (SP-05-0007) and SEQ ID NO: 155 (SP-05-0010).

9. The antigen binding protein of any one of claims 1 to 8, wherein the antigen binding protein is capable of activating

   - a CD4+ T cell, in particular a CD4+ CD8- T cell, and/or

   - a CD8+ T cell, in particular a CD8+ CD4-T cell, and wherein the antigen binding protein is preferably a TCR, more preferably an α/β TCR or γ/δ TCR.

10. A nucleic acid comprising a sequence encoding the antigen binding protein of any one of claims 1 to 9.

11. A vector comprising the nucleic acid of claim 10.

12. A host cell comprising the antigen binding protein of any one of claims 1 to 9, or the nucleic acid of claim 10, or the vector of claim 11.

13. A pharmaceutical composition comprising the antigen binding protein of any one of claims 1 to 9, the nucleic acid of claim 10, the vector of claim 11, or the host cell of claim 12 and optionally a pharmaceutically acceptable carrier.

14. Use of the antigen binding protein of any one of claims 1 to 9, the nucleic acid of claim 10, the vector of claim 11, the host cell of claim 12, or the pharmaceutical composition of claim 13 in the manufacture of a medicament for use in a method of treatment and/or diagnosis of a proliferative disease, in particular cancer.

15. An *in-vitro* method of detecting cancer, in particular cancer expressing CT45, in a biological sample comprising:
    a) contacting the biological sample with the antigen binding protein of any one of claims 1 to 9, and
    b) detecting binding of the antigen binding protein to the biological sample.

16. A method of producing the antigen binding protein according to any one of claims 1 to 9, comprising
    a) providing a host cell,
    b) providing a genetic construct comprising a nucleic acid encoding the antigen binding protein of any of claims 1 to 9,
    c) introducing the genetic construct into the host cell, and
    d) expressing the genetic construct by the host cell.

17. The antigen binding protein of any one of claims 1 to 9, the nucleic acid of claim 10, the vector of claim 11, the host cell of claim 12, or the pharmaceutical composition of claim 13 for use as a medicament.