Claims:

1. A method of treating a subject having acute lymphoblastic leukemia (ALL), comprising administering to a patient in need thereof an anti-CD38 antibody that competes for binding to CD38 with an antibody comprising a heavy chain variable region (VH) of SEQ ID NO: 4 and a light chain variable region (VL) of SEQ ID NO: 5, wherein the anti-CD38 antibody induces *in vitro* killing of ALL cells by antibody-dependent cell-mediated cytotoxicity (ADCC), antibody-dependent cellular phagocytosis (ADCP), complement dependent cytotoxicity (CDC), apoptosis, or *in vitro* modulation of CD38 enzymatic activity.
2. The method of claim 1, wherein the anti-CD38 antibody binds to the region SKRNIQFSCKNIYR (SEQ ID NO: 2) and the region EKVQTLEAWVIHGG (SEQ ID NO: 3) of human CD38 (SEQ ID NO: 1).
3. The method of claim 2, wherein the anti-CD38 antibody induces *in vitro* killing of the ALL cells that express CD38 by ADCC or CDC.
4. The method of claim 1, wherein the anti-CD38 antibody is of IgG1, IgG2, IgG3 or IgG4 isotype.
5. The method of claim 4, wherein the anti-CD38 antibody has a biantennary glycan structure with fucose content of about 50%, 40%, 45%, 40%, 35%, 30%, 25%, 20%, 15%, 14%, 13%, 12%, 11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1% or 0%.
6. The method of claim 4, wherein the anti-CD38 antibodies comprise a substitution in the antibody Fc at amino acid positions 256, 290, 298, 312, 356, 330, 333, 334, 360, 378 or 430, wherein residue numbering is according to the EU index.
7. The method of claim 1, wherein the anti-CD38 antibody comprises the heavy chain complementarity determining regions (HCDR) 1 (HCDR1), 2 (HCDR2) and 3 (HCDR3) sequences of SEQ ID NOs: 6, 7 and 8, respectively.
8. The method of claim 7, wherein the anti-CD38 antibody comprises the light chain complementarity determining regions (LCDR) 1 (LCDR1), 2 (LCDR2) and 3 (LCDR3) sequences of SEQ ID NOs: 9, 10 and 11, respectively.
9. The method of claim 8, wherein the anti-CD38 antibody comprises the heavy chain variable region (VH) of SEQ ID NO: 4 and the light chain variable region (VL) of SEQ ID NO: 5.
10. The method of claim 1, wherein the anti-CD38 antibody comprises a heavy chain comprising an amino acid sequence that is 95%, 96%, 97%, 98% or 99% identical

to that of SEQ ID NO: 12 and a light chain comprising an amino acid sequence that is 95%, 96%, 97%, 98% or 99% identical to that of SEQ ID NO: 13.

11. The method of claim 10, wherein the anti-CD38 antibody comprises the heavy chain of SEQ ID NO: 12 and the light chain of SEQ ID NO: 13.

12. The method of claim 1, wherein the ALL is B-cell lineage ALL, T-cell lineage ALL, adult ALL or pediatric ALL.

13. The method of claim 12, wherein the ALL is refractory or relapsed ALL.

14. The method of claim 12, wherein the anti-CD38 antibody is administered as a remission induction or as postinduction therapy.

15. The method of claim 12, wherein the subject has a white blood cell count of at least about 1×10^9 /L.

16. The method of claim 12, wherein the ALL cells have a Philadelphia chromosome.

17. The method of claim 12, wherein the subject is resistant or has acquired resistance to treatment with a BCR-ABL kinase inhibitor.

18. The method of claim 17, wherein the BCR-ABL kinase inhibitor is imatinib, dasatinib, nilotinib, bosutinib, ponatinib, bafetinib, saracatinib, tozasertib danusertib or ibrutinib.

19. The method of claim 1 or 12, wherein the anti-CD38 antibody is administered in combination with vincristine.

20. The method of claim 19, wherein the anti-CD38 antibody and vincristine are administered simultaneously, sequentially or separately.

21. The method of claim 1 or 12, wherein the subject is further treated or has been treated with radiotherapy.

22. The method of claim 1 or 12, wherein the subject has received hematopoietic stem cell transplantation.

Claims:

1. An anti-CD38 antibody for use in the treatment of acute lymphoblastic leukemia (ALL), wherein the anti-CD38 antibody competes for binding to CD38 with an antibody comprising a heavy chain variable region (VH) of SEQ ID NO: 4 and a light chain variable region (VL) of SEQ ID NO: 5; and

   wherein the anti-CD38 antibody induces *in vitro* killing of ALL cells by antibody-dependent cell-mediated cytotoxicity (ADCC), antibody-dependent cellular phagocytosis (ADCP), complement dependent cytotoxicity (CDC), apoptosis, or *in vitro* modulation of CD38 enzymatic activity.
2. The anti-CD38 antibody of claim 1, wherein the anti-CD38 antibody binds to the region SKRNIQFSCKNIYR (SEQ ID NO: 2) and the region EKVQTLEAWVIHGG (SEQ ID NO: 3) of human CD38 (SEQ ID NO: 1).
3. The anti-CD38 antibody of claim 2, wherein the anti-CD38 antibody induces *in vitro* killing of the ALL cells that express CD38 by ADCC or CDC.
4. The anti-CD38 antibody of claim 1, wherein the anti-CD38 antibody is of IgG1, IgG2, IgG3 or IgG4 isotype.
5. The anti-CD38 antibody of claim 4, wherein the anti-CD38 antibody has a biantennary glycan structure with fucose content of about 50%, 40%, 45%, 40%, 35%, 30%, 25%, 20%, 15%, 14%, 13%, 12%, 11% 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1% or 0%.
6. The anti-CD38 antibody of claim 4, wherein the anti-CD38 antibodies comprise a substitution in the antibody Fc at amino acid positions 256, 290, 298, 312, 356, 330, 333, 334, 360, 378 or 430, wherein residue numbering is according to the EU index.
7. The anti-CD38 antibody of claim 1, wherein the anti-CD38 antibody comprises the heavy chain complementarity determining regions (HCDR) 1 (HCDR1), 2 (HCDR2) and 3 (HCDR3) sequences of SEQ ID NOs: 6, 7 and 8, respectively.
8. The anti-CD38 antibody of claim 7, wherein the anti-CD38 antibody comprises the light chain complementarity determining regions (LCDR) 1 (LCDR1), 2 (LCDR2) and 3 (LCDR3) sequences of SEQ ID NOs: 9, 10 and 11, respectively.
9. The anti-CD38 antibody of claim 8, wherein the anti-CD38 antibody comprises the heavy chain variable region (VH) of SEQ ID NO: 4 and the light chain variable region (VL) of SEQ ID NO: 5.
10. The anti-CD38 antibody of claim 1, wherein the anti-CD38 antibody comprises a heavy chain comprising an amino acid sequence that is 95%, 96%, 97%, 98% or 99% identical to that of SEQ ID NO: 12 and a light chain comprising an amino acid sequence that is 95%, 96%, 97%, 98% or 99% identical to that of SEQ ID NO: 13.
11. The anti-CD38 antibody of claim 10, wherein the anti-CD38 antibody comprises the heavy chain of SEQ ID NO: 12 and the light chain of SEQ ID NO: 13.

12. The anti-CD38 antibody of claim 1, wherein the ALL is B-cell lineage ALL, T-cell lineage ALL, adult ALL or pediatric ALL.

13. The anti-CD38 antibody of claim 12, wherein the ALL is refractory or relapsed ALL.

14. The anti-CD38 antibody of claim 12, wherein the anti-CD38 antibody is to be administered as a remission induction or as postinduction therapy.

15. The anti-CD38 antibody of claim 12, wherein a subject to be treated has a white blood cell count of at least about 1 x 10^9 /L.

16. The anti-CD38 antibody of claim 12, wherein the ALL cells have a Philadelphia chromosome.

17. The anti-CD38 antibody of claim 12, wherein a subject to be treated is resistant or has acquired resistance to treatment with a BCR-ABL kinase inhibitor.

18. The anti-CD38 antibody of claim 17, wherein the BCR-ABL kinase inhibitor is imatinib, dasatinib, nilotinib, bosutinib, ponatinib, bafetinib, saracatinib, tozasertib danusertib or ibrutinib.

19. The anti-CD38 antibody of claim 1 or 12, wherein the anti-CD38 antibody is to be administered in combination with vincristine.

20. The anti-CD38 antibody of claim 19, wherein the anti-CD38 antibody and vincristine are to be administered simultaneously, sequentially or separately.

21. The anti-CD38 antibody of claim 1 or 12, wherein a subject to be treated is further treated or has been treated with radiotherapy.

22. The anti-CD38 antibody of claim 1 or 12, wherein a subject to be treated has received hematopoietic stem cell transplantation.

23. The use of an anti-CD38 antibody in the manufacture of a medicament for the treatment of acute lymphoblastic leukemia (ALL),

wherein the anti-CD38 antibody competes for binding to CD38 with an antibody comprising a heavy chain variable region (VH) of SEQ ID NO: 4 and a light chain variable region (VL) of SEQ ID NO: 5; and

wherein the anti-CD38 antibody induces *in vitro* killing of ALL cells by antibody-dependent cell-mediated cytotoxicity (ADCC), antibody-dependent cellular phagocytosis (ADCP), complement dependent cytotoxicity (CDC), apoptosis, or *in vitro* modulation of CD38 enzymatic activity.

24. The use of claim 23, wherein the anti-CD38 antibody binds to the region SKRNIQFSCKNIYR (SEQ ID NO: 2) and the region EKVQTLEAWVIHGG (SEQ ID NO: 3) of human CD38 (SEQ ID NO: 1).

25. The use of claim 24, wherein the anti-CD38 antibody induces *in vitro* killing of the ALL cells that express CD38 by ADCC or CDC.

26. The use of claim 23, wherein the anti-CD38 antibody is of IgG1, IgG2, IgG3 or IgG4 isotype.

27. The use of claim 26, wherein the anti-CD38 antibody has a biantennary glycan structure with fucose content of about 50%, 40%, 45%, 40%, 35%, 30%, 25%, 20%, 15%, 14%, 13%, 12%, 11% 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1% or 0%.

28. The use of claim 26, wherein the anti-CD38 antibodies comprise a substitution in the antibody Fc at amino acid positions 256, 290, 298, 312, 356, 330, 333, 334, 360, 378 or 430, wherein residue numbering is according to the EU index.

29. The use of claim 23, wherein the anti-CD38 antibody comprises the heavy chain complementarity determining regions (HCDR) 1 (HCDR1), 2 (HCDR2) and 3 (HCDR3) sequences of SEQ ID NOs: 6, 7 and 8, respectively.

30. The use of claim 29, wherein the anti-CD38 antibody comprises the light chain complementarity determining regions (LCDR) 1 (LCDR1), 2 (LCDR2) and 3 (LCDR3) sequences of SEQ ID NOs: 9, 10 and 11, respectively.

31. The use of claim 30, wherein the anti-CD38 antibody comprises the heavy chain variable region (VH) of SEQ ID NO: 4 and the light chain variable region (VL) of SEQ ID NO: 5.

32. The use of claim 23, wherein the anti-CD38 antibody comprises a heavy chain comprising an amino acid sequence that is 95%, 96%, 97%, 98% or 99% identical to that of SEQ ID NO: 12 and a light chain comprising an amino acid sequence that is 95%, 96%, 97%, 98% or 99% identical to that of SEQ ID NO: 13.

33. The use of claim 32, wherein the anti-CD38 antibody comprises the heavy chain of SEQ ID NO: 12 and the light chain of SEQ ID NO: 13.

34. The use of claim 23, wherein the ALL is B-cell lineage ALL, T-cell lineage ALL, adult ALL or pediatric ALL.

35. The use of claim 34, wherein the ALL is refractory or relapsed ALL.

36. The use of claim 34, wherein the anti-CD38 antibody is to be administered as a remission induction or as postinduction therapy.

37. The use of claim 34, wherein a subject to be treated has a white blood cell count of at least about 1×10^9 /L.

38. The use of claim 34, wherein the ALL cells have a Philadelphia chromosome.

39. The use of claim 34, wherein a subject to be treated is resistant or has acquired resistance to treatment with a BCR-ABL kinase inhibitor.

40. The use of claim 39, wherein the BCR-ABL kinase inhibitor is imatinib, dasatinib, nilotinib, bosutinib, ponatinib, bafetinib, saracatinib, tozasertib danusertib or ibrutinib.

41. The use of claim 23 or 34, wherein the anti-CD38 antibody is to be administered in combination with vincristine.

42. The use of claim 41, wherein the anti-CD38 antibody and vincristine are to be administered simultaneously, sequentially or separately.

43. The use of claim 23 or 34, wherein a subject to be treated is further treated or has been treated with radiotherapy.

44. The use of claim 23 or 34, wherein a subject to be treated has received hematopoietic stem cell transplantation.