Claims

1. A pharmaceutical composition comprising a CD33 targeting compound and at least one epigenetic factor, wherein
   (a) the CD33 targeting compound is a bispecific single chain antibody construct comprising a first binding domain specifically binding to CD33 and a second binding domain specifically binding to CD3; and
   (b) the at least one epigenetic factor is selected from the group consisting of histone deacetylase (HDAC) inhibitor panobinostat, DNA methyltransferase (DNMT) I inhibitor 5-azacitidine, hydroxyurea, and Granulocyte-Colony Stimulating Factor (G-CSF).

2. The pharmaceutical composition of claim 1, wherein the bispecific single chain antibody construct binds to human and cynomolgous CD3 and human and cynomolgous CD33.

3. The pharmaceutical composition of claim 2, wherein the bispecific single chain antibody construct comprises
   - a first binding domain specifically binding to CD33 and comprising a VL chain having an amino acid sequence selected from the group consisting of SEQ ID NO: 6, 24, 42, 60, 78, 96, 114 and 132 and a VH chain having an amino acid sequence selected from the group consisting of SEQ ID NO:1, 19, 37, 55, 73, 91, 109 and127; and
   - a second binding domain specifically binding to CD3 and comprising a VL chain having an amino acid sequence selected from the group consisting SEQ ID NO: 154, 157, 160, 163, 166, 169 and 172 and a VH chain having an amino acid sequence selected from the group consisting of SEQ ID NO:155, 158, 161, 164, 167, 170 and 173.

4. The pharmaceutical composition of claim 3, wherein the bispecific single chain antibody construct comprises an amino acid sequence as depicted in any of SEQ ID NOs:13, 15, 17, 31, 33, 35, 49, 51, 53, 67, 69, 71, 85, 87, 89, 103, 105, 107, 121, 123, 125, 139, 141, 143, 148, 150, 152, 215, 217, 219, 221, 223, 225 and 227.

5. The pharmaceutical composition of any preceding claim for use in the treatment of a myeloid leukemia.

6. The pharmaceutical composition of claim 5, wherein
   (a) the epigenetic factor is to be administered prior to the administration of the CD33 targeting compound;
   (b) the epigenetic factor is to be administered subsequent to the administration of the CD33 targeting compound; or
   (c) the epigenetic factor and the CD33 targeting compound are to be administered simultaneously.

7. The pharmaceutical composition of claim 5 or 6, wherein a first dose of the epigenetic factor is to be administered prior to the start of the administration of the CD33 targeting compound.

8. The pharmaceutical composition of claim 7, wherein the administration of the epigenetic factor is to be continued during the administration of the CD33 targeting compound.

9. The pharmaceutical composition of claim 5, wherein the myeloid leukemia is selected from the group consisting of acute myeloblastic leukemia, chronic neutrophilic leukemia, myeloid dendritic cell leukemia, accelerated phase chronic myelogenous leukemia, acute myelomonocytic leukemia, juvenile myelomonocytic leukemia, chronic myelomonocytic leukemia, acute basophilic leukemia, acute eosinophilic leukemia, chronic eosinophilic leukemia, Acute megakaryoblastic leukemia, essential thrombocytosis, acute erythroid leukemia, polycythemia vera, myelodysplastic syndrome, acute panmyelosis, myeloid sarcoma, and acute biphenotypic leukaemia.

10. Use of an epigenetic factor in the manufacture of an agent for the amelioration and/or treatment of a myeloid leukemia, wherein the epigenetic factor increases the responsiveness of a patient to a CD33 targeting compound, wherein
   (a) the CD33 targeting compound is a bispecific single chain antibody construct comprising a first binding domain specifically binding to CD33 and a second binding domain specifically binding to CD3; and

(b) the at least one epigenetic factor is selected from the group consisting of histone deacetylase (HDAC) inhibitor panobinostat, , DNA methyltransferase (DNMT) I inhibitor 5-azacitidine, hydroxyurea, and Granulocyte-Colony Stimulating Factor (G-CSF).

11. A kit comprising a pharmaceutical composition of any of claims 1 to 9 or an epigenetic factor defined in claim 10 and a bispecific CD33 targeting compound comprising a first binding domain specifically binding to CD33 and a second binding domain specifically binding to CD3, to be employed in the amelioration and/or treatment of a myeloid leukemia.