

CLAIMS

1. A polypeptide that redirects T cells for killing of CD123 expressing cells, comprising one immunoglobulin single variable domain (ISV) that specifically binds T cell receptor (TCR) and one or more ISV that specifically bind CD123,
5 wherein the ISV that specifically binds TCR consists of 4 framework regions (FR1 to FR4, respectively) and 3 complementarity determining regions (CDR1 to CDR3, respectively), and the ISV that specifically binds TCR is chosen from the group consisting of SEQ ID NOs: 42 and 78 to 180,
and wherein the one or more ISV that specifically bind CD123 consists of 4 framework
10 regions (FR1 to FR4, respectively) and 3 complementarity determining regions (CDR1 to CDR3, respectively), and the one or more ISV that specifically bind CD123 is chosen from the group consisting of SEQ ID NOs: 1-6.
2. The polypeptide according to claim 1, wherein the ISV that specifically binds TCR
15 consists of 4 framework regions (FR1 to FR4, respectively) and 3 complementarity determining regions (CDR1 to CDR3, respectively), in which CDR1 is SEQ ID NO: 181, CDR2 is SEQ ID NO: 192, and CDR3 is SEQ ID NO: 218.
3. The polypeptide according to claim 1 or 2, wherein the one or more ISV that
20 specifically bind CD123 consists of 4 framework regions (FR1 to FR4, respectively) and 3 complementarity determining regions (CDR1 to CDR3, respectively), in which CDR1 is SEQ ID NO: 11, CDR2 is SEQ ID NO: 17, and CDR3 is SEQ ID NO: 21.
4. The polypeptide according to any of claims 1 to 3, comprising a further ISV that
25 specifically binds CD123 and consists of 4 framework regions (FR1 to FR4, respectively) and 3 complementarity determining regions (CDR1 to CDR3, respectively), and the further ISV that specifically binds CD123 is chosen from the group consisting of SEQ ID NOs: 7 to 10.

5. The polypeptide according to any of claims 1 to 4, comprising two or more ISVs that specifically bind CD123 wherein the two or more ISVs that specifically bind CD123 are biparatopic, comprising a first ISV and a second ISV, wherein the first ISV binds to an epitope on CD123 that is different from the epitope on CD123 bound by the second ISV.
6. The polypeptide according to any of claims 1 to 5, wherein the ISV that specifically binds TCR and the one or more ISV that specifically bind CD123 consist of a single domain antibody, a dAb, a Nanobody, a VHH, a humanized VHH, a camelized VH or a VHH which has been obtained by affinity maturation.
7. The polypeptide according to any of claims 1 to 6, wherein said polypeptide is chosen from the group consisting of SEQ ID NOs: 47, 49, 52, 53, 55, 56 and 58-61.
8. A construct for redirection of T cells for killing of CD123 expressing cells having increased half-life comprising a polypeptide according to any of claims 1 to 7 and one or more binding units that can bind to serum albumin or a serum immunoglobulin, in which said one or more binding units provide the construct with increased half-life, compared to the corresponding polypeptide according to any of claims 1 to 7.
9. The construct according to claim 8, wherein the one or more binding units bind to human serum albumin or IgG.
10. A nucleic acid encoding the polypeptide according to any of claims 1 to 7.
11. A nucleic acid encoding the construct according to claim 8 or 9.
12. An expression vector comprising the nucleic acid according to claim 10 or 11.
13. A host cell for production of the polypeptide according to any of claims 1 to 7 or the construct according to claim 8 or 9, the host cell comprising the nucleic acid according to claim 10 or 11, or the expression vector according to claim 12.

14. A method for the production of the polypeptide according to any of claims 1 to 7 or the construct according to claim 8 or 9, comprising the steps of:
- 5 a) expressing, in a suitable host cell or host organism or in another suitable expression system, the nucleic acid according to claim 10 or 11, or the expression vector according to claim 12; followed by
- b) isolating and/or purifying the polypeptide according to any of claims 1 to 7 or the construct according to claim 8 or 9.
- 10 15. A composition for redirection of T cells for killing of CD123 expressing cells, comprising the polypeptide according to any of claims 1 to 7, or the construct according to claim 8 or 9, and a pharmaceutically acceptable carrier, diluent or excipient.
- 15 16. A polypeptide chosen from the group consisting of SEQ ID NOs: 47, 49, 53, and 58-61 that redirects T cells for killing of CD123 expressing cells, or a construct comprising the polypeptide and one or more binding units that can bind to serum albumin or a serum immunoglobulin, in which said one or more binding units provide the construct with increased half-life, compared to the corresponding polypeptide, for
- 20 use as a medicament.
17. Use of a polypeptide chosen from the group consisting of SEQ ID NOs: 47, 49, 53, and 58-61, or a construct comprising the polypeptide and one or more binding units that can bind to serum albumin or a serum immunoglobulin, in which said one or
- 25 more binding units provide the construct with increased half-life, compared to the corresponding polypeptide, in the manufacture of a medicament for the treatment and/or amelioration of a cancer chosen from the group consisting of lymphomas (including Burkitt's lymphoma, Hodgkin's lymphoma and non-Hodgkin's lymphoma), leukemias (including acute myeloid leukemia, chronic myeloid leukemia, acute B
- 30 lymphoblastic leukemia, chronic lymphoid leukemia and hairy cell leukemia), myelodysplastic syndrome, blastic plasmacytoid dendritic cell neoplasm, systemic mastocytosis and multiple myeloma.