CLAIMS

1) Anti-GD2 chimeric antigen receptor comprising or consisting of, from the N-terminus to the C-terminus:

a) a signal peptide,

b) an anti GD2 single chain antibody domain,

c) a hinge,

d) a trans membrane domain,

e) at least two co-stimulatory signaling domains, and

f) CD3Zeta chain sequence,

wherein said anti GD2 single chain antibody domain comprises or consists of anti GD2 VL sequence and anti GD2 VH sequence linked each other by a linker, said linker being a short flexible glycines-rich linker with a length from 7 to 14 amino acids, such as from 7 to 12, from 7 to 10 or 8 amino acids, for example said linker being selected from G7S2 linker GSGGGGSGG (SEQ ID NO:13), (G4S)2 linker GGGGSGGGG (SEQ ID NO:14), G4SG2 linker GGGGSGG (SEQ ID NO:15), G3SG4 linker GGGSGGGG (SEQ ID NO:16) SG4SG3 linker SGGGGSGGG (SEQ ID NO:17), (SG4)2 S linker SGGGGSGGGGS (SEQ ID NO:18), (SG4)2 SG linker SGGGGSGGGGSG (SEQ ID NO:19), (SG4)2 SG3 linker SGGGGSGGGGSGGG linker (SEQ ID NO:20), (SG4)2 SGGGGSGGGG (SEQ ID NO:21), or (SG4)2 SG2 SGGGGSGGGGSGG (SEQ ID NO:22), preferably G7S2 linker GSGGGGSGG (SEQ ID NO:13).

2) Anti-GD2 chimeric antigen receptor according to claim 1, wherein

anti GD2 VL sequence comprises CDR1 sequence QSLVHRNGNTY (SEQ ID NO:5), CDR2 sequence: KVS and CDR3 sequence SQSTHVP (SEQ ID NO:7); whereas

anti GD2 VH sequence comprises CDR1 sequence: GSSFTGYN (SEQ ID NO:8), CDR2 sequence: IDPYYGGT (SEQ ID NO:9) and CDR3 sequence: VSGMEY (SEQ ID NO:10).

3) Anti GD2 chimeric antigen receptor according to any one of claims 1-2, wherein

anti GD2 VL sequence comprises or consists of: DILLTQTPLSLPVSLGDQASISCRSSQSLVHRNGNTYLHWYLQKPGQSPKLLIHK

VSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDLGVYFCSQSTHVPPLTFGAGTK LELKRADAAPTVSIFP (SEQ ID NO:11), and

anti GD2 VH sequence comprises or consists of: EVKLQQSGPSLVEPGASVMISCKASGSSFTGYNMNWVRQNIGKSLEWIGAIDPY YGGTSYNQKFKGRATLTVDKSSSTAYMHLKSLTSEDSAVYYCVSGMEYWGQGT SVTVSS (SEQ ID NO:12).

4) Anti-GD2 chimeric antigen receptor according to any one of claims 1-3, wherein said hinge comprises or consists of one or more of the following hinges:

IgG-based hinge of sequence AKTTPPSVYGRVTVSSAEPKSCDKTHTCPPCP (SEQ ID NO:23);

hinge Spacer-CD8α of sequence PAPRPPTPAPTIASQPLSLRPEACRPAAGGAVHTRGLDFA (SEQ ID NO:24);

CD8stalk of sequence TTTPAPRPPTPAPTIASQPLSLRPEACRPAAGGAVHTRGLDFACD (SEQ ID NO:25);

hinge CD28 of sequence EVMYPPPYLDNEKSNGTIIHVKGKHLCPSPLFPGPSKP (SEQ ID NO:26);

hinge CH2-CH3 of sequence ESKYGPPCPSCPAPEFLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSQEDPE VQFNWYVDGVEVHNAKTKPREEQFNSTYRVVSVLTVLHQDWLNGKEYKCKVSN KGLPSSIEKTISKAKGQPREPQVYTLPPSQEEMTKNQVSLTCLVKGFYPSDIAVE WESNGQPENNYKTTPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALH NHYTQKSLSLSLGK (SEQ ID NO:27);

hinge CH3 of sequence ESKYGPPCPSCPGQPREPQVYTLPPSQEEMTKNQVSLTCLVKGFYPSDIAVEW ESNGQPENNYKTTPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHN HYTQKSLSLSLGK (SEQ ID NO:28);

preferably IgG-based hinge of sequence SEQ ID NO:23.

5) Anti-GD2 chimeric antigen receptor according to any one of claims 1-4, wherein said trans membrane domain is chosen from the group consisting of CD8aTM: CDIYIWAPLAGTCGVLLLSLVIT (SEQ ID NO:6); CD28TM:FWVLVVVGGVLACYSLLVTVAFIIFWV (SEQ ID NO:29); preferably is CD28TM of sequence FWVLVVVGGVLACYSLLVTVAFIIFWV (SEQ ID NO:29).

6) Anti-GD2 chimeric antigen receptor according to any one of claims 1-5, wherein said at least two co-stimulatory signaling domains are chosen from the group consisting of:

a sequence obtained by linking:

CD28 cytoplasmic sequence:

RSKRSRLLHSDYMNMTPRRPGPTRKHYQPYAPPRDFAAYRS (SEQ ID NO:30) to

OX40 sequence:

RDQRLPPDAHKPPGGGSFRTPIQEEQADAHSTLAKI (SEQ ID NO:32), wherein CD28 cytoplasmic sequence is positioned before or after OX40 sequence;

a sequence obtained by linking:

CD28 cytoplasmic sequence:

RSKRSRLLHSDYMNMTPRRPGPTRKHYQPYAPPRDFAAYRS (SEQ ID NO:30) to

CD137 (4-1BB) sequence:

KRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGCEL (SEQ ID NO:31), wherein CD28 cytoplasmic sequence is positioned before or after CD137 (4-1BB) sequence;

a sequence obtained by linking:

OX40 sequence:

RDQRLPPDAHKPPGGGSFRTPIQEEQADAHSTLAKI (SEQ ID NO:32) to

CD28 cytoplasmic sequence:

RSKRSRLLHSDYMNMTPRRPGPTRKHYQPYAPPRDFAAYRS (SEQ ID NO:30), wherein OX40 sequence is positioned before or after CD28 cytoplasmic sequence; or

a sequence obtained by linking:

OX40 sequence:

RDQRLPPDAHKPPGGGSFRTPIQEEQADAHSTLAKI (SEQ ID NO:32) to

CD137 (4-1BB) sequence:

KRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGCEL (SEQ ID NO:31), wherein OX40 sequence is positioned before or after CD137 (4-1BB) sequence;

preferably a sequence obtained by linking:

CD28 cytoplasmic sequence:
RSKRSRLLHSDYMNMTPRRPGPTRKHYQPYAPPRDFAAYRS (SEQ ID NO:30), to

CD137 (4-1BB) sequence:
KRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGCEL (SEQ ID NO:31), wherein CD28 cytoplasmic sequence is positioned before CD137 (4-1BB) sequence.

7) Anti-GD2 chimeric antigen receptor according to any one of claims 1-6, wherein **CD3-Zeta chain** sequence is RVKFSRSADAPAYQQGQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRK NPQEGLYNELQKDKMAEAYSEIGMKGERRRGKGHDGLYQGLSTATKDTYDALH MQALPPR* (**SEQ ID NO:53**).

8) Anti-GD2 chimeric antigen receptor according to any one of claims 1-7, further comprising cytoplasmic moiety of CD8cyt of sequence LYCNHRN (SEQ ID NO:51) between the trans membrane domain and the co-stimulatory signaling domain.

9) Anti-GD2 chimeric antigen receptor according to any one of claims 1-8, wherein said signal peptide comprises or consists of MEFGLSWLFLVAILKGVQCSR (SEQ ID NO:3).

10)Anti-GD2 chimeric antigen receptor according to any one of claims 1-9, wherein said anti-GD2 chimeric antigen receptor comprises or consists of the following sequence:

MEFGLSWLFLVAILKGVQCSRDILLTQTPLSLPVSLGDQASISCRSSQSLV HRNGNTYLHWYLQKPGQSPKLLIHKVSNRFSGVPDRFSGSGSGTDFTLKISRVE AEDLGVYFCSQSTHVPPLTFGAGTKLELKRADAAPTVSIFPGSGGGGSGGEVKL QQSGPSLVEPGASVMISCKASGSSFTGYNMNWVRQNIGKSLEWIGAIDPYYGGT SYNQKFKGRATLTVDKSSSTAYMHLKSLTSEDSAVYYCVSGMEYWGQGTSVTV SSAKTTPPSVYGRVTVSSAEPKSCDKTHTCPPCPDPKFWVLVVVGGVLACYSLL VTVAFIIFWVRSKRSRLLHSDYMNMTPRRPGPTRKHYQPYAPPRDFAAYRSKRG RKKLLYIFKQPFMRPVQTTQEEDGCSCRFPEEEEGGCELRVKFSRSADAPAYQQ GQNQLYNELNLGRREEYDVLDKRRGRDPEMGGKPRRKNPQEGLYNELQKDKM AEAYSEIGMKGERRRGKGHDGLYQGLSTATKDTYDALHMQALPPR* (SEQ ID NO:39).

11) Nucleotide sequence or vector comprising the nucleotide sequence, said nucleotide sequence comprising or consisting of a nucleotide sequence that encodes an anti-GD2 chimeric antigen receptor as defined in any one of claims 1-10.

12) Nucleotide sequence or vector according to claim 11, wherein

anti GD2 VL sequence is encoded by the nucleotide sequence GATATTTTGCTGACCCAAACTCCACTCTCCCTGCCTGTCAGTCTTGGAGATCAAGCCTCCATCTCTTGCAGATCTAGTCAGAGTCTTGTACACCGTAATGGAAACACCTATTTACATTGGTACCTGCAGAAGCCAGGCCAGTCTCCAAAGCTCCTGATTCACAAAGTTTCCAACCGATTTTCTGGGGTCCCAGACAGGTTCAGTGGCAGTGGATCAGGGACAGATTTCACACTCAAGATCAGCAGAGTGGAGGCTGAGGATCTGGGAGTTTATTTCTGTTCTCAAAGTACACATGTTCCTCCGCTCACGTTCGGTGCTGGGACCAAGCTGGAGCTGAAACGGGCTGATGCTGCACCAACTGTATCCATCTTCCCA (**SEQ ID NO:36**), and

anti GD2 VH sequence is encoded by the nucleotide sequence GAGGTGAAGCTTCAGCAGTCTGGACCTAGCCTGGTGGAGCCTGGCGCTTCAGTGATGATATCCTGCAAGGCTTCTGGTTCCTCATTCACTGGCTACAACATGAACTGGGTGAGGCAGAACATTGGAAAGAGCCTTGAATGGATTGGAGCTATTGATCCTTACTATGGTGGAACTAGCTACAACCAGAAGTTCAAGGGCAGGGCCACATTGACTGTAGACAAATCGTCCAGCACAGCCTACATGCACCTCAAGAGCCTGACATCTGAGGACTCTGCAGTCTATTACTGTGTAAGCGGAATGGAGTACTGGGGTCAAGGAACCTCAGTCACCGTCTCCTCA (**SEQ ID NO:37**).

13) Nucleotide sequence or vector according to any one of claims 11-12 wherein the nucleotide sequence encoding anti-GD2 chimeric antigen receptor is:

ATGGAGTTTGGGCTGAGCTGGCTTTTTCTTGTGGCTATTTTAAAAGGTGTCCAGTGCTCTAGAGATATTTTGCTGACCCAAACTCCACTCTCCCTGCCTGTCAGTCTTGGAGATCAAGCCTCCATCTCTTGCAGATCTAGTCAGAGTCTTGTACACCGTAATGGAAACACCTATTTACATTGGTACCTGCAGAAGCCAGGCCAGTCTCCAAAGCTCCTGATTCACAAAGTTTCCAACCGATTTTCTGGGGTCCCAGACAGGTTCAGTGGCAGTGGATCAGGGACAGATTTCACACTCAAGATCAGCAGAGTGGAGGCTGAGGATCTGGGAGTTTATTTCTGTTCTCAAAGTACACATGTTCCTCCGCTCACGTTCGGTGCTGGGACCAAGCTGGAGCTGAAACGGGCTGATGCTGCACCAACTGTATCCATCTTCCCAGGCTCGGGCGGTGGTGGGTCGGGTGGCGA

GGTGAAGCTTCAGCAGTCTGGACCTAGCCTGGTGGAGCCTGGCGCTTCAGT
GATGATATCCTGCAAGGCTTCTGGTTCCTCATTCACTGGCTACAACATGAACT
GGGTGAGGCAGAACATTGGAAAGAGCCTTGAATGGATTGGAGCTATTGATCC
TTACTATGGTGGAACTAGCTACAACCAGAAGTTCAAGGGCAGGGCCACATTG
ACTGTAGACAAATCGTCCAGCACAGCCTACATGCACCTCAAGAGCCTGACAT
CTGAGGACTCTGCAGTCTATTACTGTGTAAGCGGAATGGAGTACTGGGGTCA
AGGAACCTCAGTCACCGTCTCCTCAGCCAAAACGACACCCCCATCAGTCTAT
GGAAGGGTCACCGTCTCTTCAGCGGAGCCCAAATCTTGTGACAAAACTCACA
CATGCCCACCGTGCCCGGATCCCAAATTTTGGGTGCTGGTGGTGGTTGGTG
GAGTCCTGGCTTGCTATAGCTTGCTAGTAACAGTGGCCTTTATTATTTTCTGG
GTGAGGAGTAAGAGGAGCAGGCTCCTGCACAGTGACTACATGAACATGACTC
CCCGCCGCCCCGGGCCCACCCGCAAGCATTACCAGCCCTATGCCCCACCAC
GCGACTTCGCAGCCTATCGCTCCAAACGGGGCAGAAAGAAACTCCTGTATAT
ATTCAAACAACCATTTATGAGACCAGTACAAACTACTCAAGAGGAAGATGGCT
GTAGCTGCCGATTTCCAGAAGAAGAAGAAGGAGGATGTGAACTGAGAGTGAA
GTTCAGCAGGAGCGCAGACGCCCCCGCGTACCAGCAGGGCCAGAACCAGCT
CTATAACGAGCTCAATCTAGGACGAAGAGAGGAGTACGATGTTTTGGACAAG
AGACGTGGCCGGGACCCTGAGATGGGGGGAAAGCCGAGAAGGAAGAACCC
TCAGGAAGGCCTGTACAATGAACTGCAGAAAGATAAGATGGCGGAGGCCTAC
AGTGAGATTGGGATGAAAGGCGAGCGCCGGAGGGGCAAGGGGCACGATGG
CCTTTACCAGGGTCTCAGTACAGCCACCAAGGACACCTACGACGCCCTTCAC
ATGCAGGCCCTGCCCCCTCGCTAA (SEQ ID NO:52).

14) Nucleotide or vector sequence according to any one of claims 11-13, said nucleotide sequence further comprising a nucleotide sequence encoding a suicide gene inducible amino acid sequence linked to the nucleotide sequence encoding said chimeric antigen receptor by a nucleotide sequence encoding a 2A self-cleaving peptide.

15) Nucleotide sequence or vector according to claim 14, wherein the suicide gene inducible amino acid sequence comprises or consists of a chimeric Caspase-9 polypeptide, a herpes simplex virus thymidine kinase or ΔCD19 sequence.

16) Nucleotide sequence or vector according to any one of claims 11-15, wherein the nucleotide sequence is:

ATGCTCGAGGGAGTGCAGGTGGAGACTATCTCCCCAGGAGACGGGC

GCACCTTCCCCAAGCGCGGCCAGACCTGCGTGGTGCACTACACCGGGATGC
TTGAAGATGGAAAGAAAGTTGATTCCTCCCGGGACAGAAACAAGCCCTTTAA
GTTTATGCTAGGCAAGCAGGAGGTGATCCGAGGCTGGGAAGAAGGGGTTGC
CCAGATGAGTGTGGGTCAGAGAGCCAAACTGACTATATCTCCAGATTATGCC
TATGGTGCCACTGGGCACCCAGGCATCATCCCACCACATGCCACTCTCGTCT
TCGATGTGGAGCTTCTAAAACTGGAATCTGGCGGTGGATCCGGAGTCGACG
GATTTGGTGATGTCGGTGCTCTTGAGAGTTTGAGGGGAAATGCAGATTTGGC
TTACATCCTGAGCATGGAGCCCTGTGGCCACTGCCTCATTATCAACAATGTGA
ACTTCTGCCGTGAGTCCGGGCTCCGCACCCGCACTGGCTCCAACATCGACT
GTGAGAAGTTGCGGCGTCGCTTCTCCTCGCTGCATTTCATGGTGGAGGTGAA
GGGCGACCTGACTGCCAAGAAAATGGTGCTGGCTTTGCTGGAGCTGGCGCg
GCAGGACCACGGTGCTCTGGACTGCTGCGTGGTGGTCATTCTCTCTCACGG
CTGTCAGGCCAGCCACCTGCAGTTCCCAGGGGCTGTCTACGGCACAGATGG
ATGCCCTGTGTCGGTCGAGAAGATTGTGAACATCTTCAATGGGACCAGCTGC
CCCAGCCTGGGAGGGAAGCCCAAGCTCTTTTTCATCCAGGCCTGTGGTGGG
GAGCAGAAAGACCATGGGTTTGAGGTGGCCTCCACTTCCCCTGAAGACGAGT
CCCCTGGCAGTAACCCCGAGCCAGATGCCACCCCGTTCCAGGAAGGTTTGA
GGACCTTCGACCAGCTGGACGCCATATCTAGTTTGCCCACACCCAGTGACAT
CTTTGTGTCCTACTCTACTTTCCCAGGTTTTGTTTCCTGGAGGGACCCCAAGA
GTGGCTCCTGGTACGTTGAGACCCTGGACGACATCTTTGAGCAGTGGGCTCA
CTCTGAAGACCTGCAGTCCCTCCTGCTTAGGGTCGCTAATGCTGTTTCGGTG
AAAGGGATTTATAAACAGATGCCTGGTTGCTTTAATTTCCTCCGGAAAAAACT
TTTCTTTAAAACATCAGCTAGCAGAGCCGAGGGCAGGGGAAGTCTTCTAACA
TGCGGGGACGTGGAGGAAAATCCCGGGCCCATGGAGTTTGGGCTGAGCTGG
CTTTTTCTTGTGGCTATTTTAAAAGGTGTCCAGTGCTCTAGAGATATTTTGCTG
ACCCAAACTCCACTCTCCCTGCCTGTCAGTCTTGGAGATCAAGCCTCCATCTC
TTGCAGATCTAGTCAGAGTCTTGTACACCGTAATGGAAACACCTATTTACATT
GGTACCTGCAGAAGCCAGGCCAGTCTCCAAAGCTCCTGATTCACAAAGTTTC
CAACCGATTTTCTGGGGTCCCAGACAGGTTCAGTGGCAGTGGATCAGGGACA
GATTTCACACTCAAGATCAGCAGAGTGGAGGCTGAGGATCTGGGAGTTTATT
TCTGTTCTCAAAGTACACATGTTCCTCCGCTCACGTTCGGTGCTGGGACCAA
GCTGGAGCTGAAACGGGCTGATGCTGCACCAACTGTATCCATCTTCCCAGGC
TCGGGCGGTGGTGGGTCGGGTGGCGAGGTGAAGCTTCAGCAGTCTGGACCT

AGCCTGGTGGAGCCTGGCGCTTCAGTGATGATATCCTGCAAGGCTTCTGGTT
CCTCATTCACTGGCTACAACATGAACTGGGTGAGGCAGAACATTGGAAAGAG
CCTTGAATGGATTGGAGCTATTGATCCTTACTATGGTGGAACTAGCTACAACC
AGAAGTTCAAGGGCAGGGCCACATTGACTGTAGACAAATCGTCCAGCACAGC
CTACATGCACCTCAAGAGCCTGACATCTGAGGACTCTGCAGTCTATTACTGTG
TAAGCGGAATGGAGTACTGGGGTCAAGGAACCTCAGTCACCGTCTCCTCAGC
CAAAACGACACCCCCATCAGTCTATGGAAGGGTCACCGTCTCTTCAGCGGAG
CCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCGGATCCCAAAT
TTTGGGTGCTGGTGGTGGTTGGTGGAGTCCTGGCTTGCTATAGCTTGCTAGT
AACAGTGGCCTTTATTATTTTCTGGGTGAGGAGTAAGAGGAGCAGGCTCCTG
CACAGTGACTACATGAACATGACTCCCCGCCGCCCCGGGCCCACCCGCAAG
CATTACCAGCCCTATGCCCCACCACGCGACTTCGCAGCCTATCGCTCCAAAC
GGGGCAGAAAGAAACTCCTGTATATATTCAAACAACCATTTATGAGACCAGTA
CAAACTACTCAAGAGGAAGATGGCTGTAGCTGCCGATTTCCAGAAGAAGAAG
AAGGAGGATGTGAACTGAGAGTGAAGTTCAGCAGGAGCGCAGACGCCCCCG
CGTACCAGCAGGGCCAGAACCAGCTCTATAACGAGCTCAATCTAGGACGAAG
AGAGGAGTACGATGTTTTGGACAAGAGACGTGGCCGGGACCCTGAGATGGG
GGGAAAGCCGAGAAGGAAGAACCCTCAGGAAGGCCTGTACAATGAACTGCA
GAAAGATAAGATGGCGGAGGCCTACAGTGAGATTGGGATGAAAGGCGAGCG
CCGGAGGGGCAAGGGGCACGATGGCCTTTACCAGGGTCTCAGTACAGCCAC
CAAGGACACCTACGACGCCCTTCACATGCAGGCCCTGCCCCCTCGCTAA
(**SEQ ID NO:50**).

17) Cell, such as T cell, such as alfa/beta and gamma/delta T cell, NK cells, NK-T cells as well as macrophages or monocyte cells, comprising the anti-GD2 chimeric antigen receptor as defined in any one of claims 1-10 and/or the vector as defined in any one of claims 11-16.

18) Cell according to claim 17, wherein said cell further comprises a suicide gene inducible amino acid sequence such as a chimeric Caspase-9 polypeptide or a herpes simplex virus thymidine kinase (HSV-TK) or ΔCD19 sequence as a safety switch.

19) Cell according to claim 18, wherein the chimeric Caspase-9 polypeptide comprises or consists of:

***iCasp9* cassette:**

MLEGVQVETISPGDGRTFPKRGQTCVVHYTGMLEDGKKVDSSRDRNKPFKFML
GKQEVIRGWEEGVAQMSVGQRAKLTISPDYAYGATGHPGIIPPHATLVFDVELLK
LESGGGSGVDGFGDVGALESLRGNADLAYILSMEPCGHCLIINNVNFCRESGLR
TRTGSNIDCEKLRRRFSSLHFMVEVKGDLTAKKMVLALLELARQDHGALDCCVV
VILSHGCQASHLQFPGAVYGTDGCPVSVEKIVNIFNGTSCPSLGGKPKLFFIQAC
GGEQKDHGFEVASTSPEDESPGSNPEPDATPFQEGLRTFDQLDAISSLPTPSDIF
VSYSTFPGFVSWRDPKSGSWYVETLDDIFEQWAHSEDLQSLLLRVANAVSVKGI
YKQMPGCFNFLRKKLFFKTSAS (*SEQ ID NO: 1*), which is linked by a linker, such as RA, to:

a *T2A peptide (2A)*:

EGRGSLLTCGDVEENPGP (*SEQ ID NO: 2*).

20) Pharmaceutical composition comprising the nucleotide sequence or vector according to any one of claims 11-16, or the cell according to any one of claims 17-19 together with one or more excipients and/or adjuvants.

21) Kit of parts comprising or consisting of:

A) an anti-GD2 chimeric antigen receptor as defined in any one of claims 1-10, or a nucleotide sequence or a vector according to any one of claims 11-16, or a cell according to any one of claims 17-19 or a pharmaceutical composition according to claim 20; and

B) an enhancer of Zeste Homolog 1 or 2 (EZH2) inhibitor or a pharmaceutical composition comprising an Enhancer of Zeste Homolog 1 or 2 (EZH2) inhibitor and one or more excipients and/or adjuvants,

wherein A) and B) are to be administered separately or sequentially.

22) Kit according to claim 21, wherein said Enhancer of Zeste Homolog 2 inhibitor is chosen from the group consisting of Tazemetostat, CPI-1205, PF-06821497, GSK126, preferably Tazemetostat.

23) Anti-GD2 chimeric antigen receptor according to any one of claims 1-10, nucleotide sequence or vector according to any one of claims 11-16, cell according to any one of claims 17-19, pharmaceutical composition according to claim 20 or kit according to any one of claims 21-22, for medical use.

24) Anti-GD2 chimeric antigen receptor according to any one of claims 1-10, nucleotide sequence or vector according to any one of claims 11-16, cell according to any one of claims 17-19, pharmaceutical composition according to claim 20, or

kit according to any one of claims 21-22, for use in the treatment of solid tumors.

25) Anti-GD2 chimeric antigen receptor according to any one of claims 1-10, nucleotide sequence or vector according to any one of claims 11-16, cell according to any one of claims 17-19, pharmaceutical composition according to claim 20, or kit according to any one of claims 21-22, for use according to claim 24, wherein said solid tumors are chosen from the group consisting of extra-cranic tumors, such as neuroblastoma, sarcomas; brain tumors, such as diffuse midline glioma (DMG) H3K27M-mutant,diffuse intrinsic pontine glioma (DIPG); adult-type diffuse gliomas, pediatric-type diffuse low-grade gliomas, pediatric-type diffuse high-grade gliomas, astrocytic gliomas, medulloblastoma, glioneuronal and neuronal tumors, ependymal tumors, choroid plexus tumors; embryonal tumors, pineal tumors, cranial and paraspinal nerve tumors; retinoblastoma; melanoma; lung cancer; gastric cancer; bladder cancer, head and neck cancer; ovarian cancer; breast cancer; pancreatic cancer; colorectal cancer.

26) Anti-GD2 chimeric antigen receptor according to any one of claims 1-10, nucleotide sequence or vector according to any one of claims 11-16, cell according to any one of claims 17-19, pharmaceutical composition according to claim 20, or kit according to any one of claims 21-22, for use according to claim 25, wherein said sarcoma is chosen from osteosarcoma, rhabdomyosarcoma, in particular Alveolar Rhabdomyosarcoma or embryonal Rhabdomyosarcoma, Ewing's sarcoma, desmoplastic small round cell tumors, leiomyosarcomas and liposarcomas; and said medulloblastoma is chosen from SHH, G3, G4 and WNT medulloblastoma subgroups.

27) Anti-GD2 chimeric antigen receptor according to any one of claims 1-10, nucleotide sequence or vector according to any one of claims 11-16, cell according to any one of claims 17-19, pharmaceutical composition according to claim 20, or kit according to any one of claims 21-22, for use according to any one of claims 24-26, wherein said solid tumor is a tumor having an expression of GD2 higher than the expression of GD2 in healthy peripheral blood mononuclear cells, wherein the expression of GD2 is measured as the percentage of GD2+ cells with respect to the total number of cells of the tumor or of the healthy peripheral blood mononuclear cells.