CLAIMS

1. A modified γδ T cell comprising:

(i) a γδ T cell receptor, in which the γδ T cell receptor provides a T cell receptor (TCR) signal (signal 1) upon binding; and

(ii) at least one co-stimulatory chimeric antigen receptor (CAR) in which the co-stimulatory chimeric antigen receptor is a synthetic receptor to recognise and target a cell surface target, connected to a transmembrane domain which traverses the cell membrane and connects to an intracellular co-stimulatory signalling region capable of providing a co-stimulatory signal (signal 2) in which the at least one co-stimulatory CAR provides the co-stimulatory signal (signal 2) upon binding the cell surface target, and in which the at least one co-stimulatory CAR does not provide a TCR cell receptor signal (signal 1).

2. A modified γδ T cell according to Claim 1, in which Vγ9Vδ2 TCR mediated recognition provides a CAR independent targeting strategy such that a stimulatory signal from the CAR will translate into a functional response only upon Vγ9Vδ2 T cell receptor stimulation.

3. A modified γδ T cell according to Claim 1 or 2, further comprising an inhibitory chimeric antigen receptor (ICAR), in which the binding of an antigen by the inhibitory chimeric antigen receptor will cause the signal provided by any binding to a disease antigen of a chimeric antigen receptor comprising an extracellular antigen binding domain with binding specificity to the disease antigen, a hinge, a transmembrane domain, and

one or more co-stimulatory signalling regions which are tuned to be inhibited to minimise activation of the γδ T cell in off-target cells.

4. A modified γδ T cell according to Claim 1, 2 or 3, in which the chimeric antigen receptor is capable of binding to a cell surface target or natural ligand found in or associated with an active or inactivated viral fragment; a peptide; a protein; an antigenic segment from a virus; a tumour-specific antigen or tumour associated antigen.

5. A modified γδ T cell according to any preceding claim for use in treatment of cancer or infection, optionally in which the infection is a viral infection.

6. A modified γδ T cell for use in the treatment of cancer or viral infection according to Claim 5 in which the modified γδ T cell is co-administered to a subject with an aminobisphosphonate, or a substitute thereof, in which the substitute is capable of enhancing the levels of phosphoantigens present on target cells *via* dysregulation of the physiological mevalonate pathway.

7. A nucleic acid sequence encoding a chimeric antigen receptor (CAR) as set out in Claim 1, in which the CAR comprises an extracellular antigen recognition domain to recognise and target a cell surface target, a hinge, a transmembrane domain, and one or more co-stimulatory signalling regions to provide a co-stimulatory signal (signal 2) upon binding a cell surface target, in which a domain providing a T cell receptor (TCR) signal (signal 1) is absent, such that the CAR is tuneable.

8. A nucleic acid sequence according to Claim 7, comprising the nucleotide sequence SEQ ID NO: 7 which encodes the amino acid sequences SEQ ID NOs: 8 to 11.

9. A process to provide a CAR modified γδ T cell comprising a step of incorporating or transducing a nucleic acid according to Claim 7 or 8 into a γδ T cell to genetically modify the γδ T cell.

10. A method to detect between a CAR comprising one or more co-stimulatory signalling regions and a CD3 zeta domain and a CAR in which a CD3 zeta domain is absent comprising a step of binding a primer pair selected from the group SEQ ID NO: 12 and SEQ ID NO: 13, and SEQ ID NO:14 and SEQ ID NO: 15 to a nucleic acid encoding a CAR to be tested

Forward (SEQ ID NO: 12)	5’-GCTCCTGCACAGTGACTACAT-3’
Reverse (SEQ ID NO: 13)	5’-GGAGTTTCTTTCTGCCCCGT-3’

Forward (SEQ ID NO: 14)	5’-CTGTAGCTGCCGATTTCCAGA-3’
Reverse (SEQ ID NO: 15)	5’-CATCGTACTCCTCTCTTCGTCC-3’

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11. A kit comprising a γδ T cell according to any of Claims 1 to 4 and a pyrophosphate/phosphonate drug for use in combination to treat a subject by autologous or allogeneic transfer.

12. A pharmaceutical composition comprising a γδ T cell according to any of Claims 1 to 4.

13 A pharmaceutical composition according to Claim 12 and a therapeutic antibody for use in combination therapy in the treatment of cancer, optionally further comprising a cytokine, interferon gamma, IL-2, chemotherapeutic, biologic or combination thereof for use in the treatment of cancer.

14. A pharmaceutical composition according to Claim 12 or 13 and a therapeutic which is suitable for use in the treatment of a viral infection.

15. A method of preparing modified γδ T cells suitable for treating a patient, the method comprising processing donor cells collected from a donor subject, in which the processing comprises modifying γδ T cells collected from the donor to incorporate a chimeric antigen receptor so as to provide modified γδ T cells according to Claim 1, in which the modified γδ T cells are provided with a tuneable response to the level of cell surface target which is expressed on a target cell recognised by the co-stimulatory CAR.

16. A method according to Claim 15, in which the preparation of modified γδ T cells is suitable for treating a patient who is allogeneic to the donor subject from whom the donor cells were collected.

17. A method according to Claim 15, in which the preparation of modified γδ T cells is suitable for treating a patient who is the donor subject from whom the donor cells were collected.

18. A γδ T-like cell, in which the γδ T-like cell is a T cell genetically engineered to express a functional gamma delta T cell receptor comprising a chimeric antigen receptor in which the chimeric antigen receptor comprises an extracellular antigen binding domain with binding specificity to a disease antigen, a hinge, a transmembrane domain, and one or more co-stimulatory signalling regions in which a CD3 zeta domain is absent (tuneable), optionally in

which the γδ T-like cell is an αβ T cell genetically engineered to express a functional gamma delta T cell receptor.

19. A T cell or T cell-like cell of defined antigen specificity, comprising a chimeric antigen receptor in which the chimeric antigen receptor comprises an extracellular antigen binding domain with binding specificity to a disease antigen, a hinge, a transmembrane domain, and

one or more co-stimulatory signalling regions to provide signal 2 in which a CD3 zeta domain is absent (tuneable).

20. A T cell or T cell-like cell of defined antigen specificity according to Claim 19 selected from a NKT cell with specificity towards α-GalCer, and a mucosal-associated invariant T (MAIT) cell with specificity for vitamin B-related antigens.

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