CLAIMS

1. A chimeric antigen receptor including an antigen-recognition domain and a signalling domain, wherein the antigen-recognition domain recognises a dysfunctional $P2X_7$ receptor.

2. The chimeric antigen receptor according to claim 1, wherein the antigen-recognition domain recognises an epitope associated with an adenosine triphosphate (ATP)-binding site of the dysfunctional $P2X_7$ receptor.

3. The chimeric antigen receptor according to claim 1 or claim 2, wherein the dysfunctional $P2X_7$ receptor has a reduced capacity to bind ATP compared to an ATP-binding capacity of a wild-type (functional) $P2X_7$ receptor.

4. The chimeric antigen receptor according to any one of claims 1 to 3, wherein the dysfunctional $P2X_7$ receptor has a conformational change that renders the receptor dysfunctional.

5. The chimeric antigen receptor according to claim 4, wherein the conformational change is a change of an amino acid from a trans-conformation to a cis-conformation.

6. The chimeric antigen receptor according to claim 5, wherein the amino acid that has changed from a trans-conformation to a cis-conformation is proline at amino acid position 210 of the dysfunctional $P2X_7$ receptor.

7. The chimeric antigen receptor according to any one of claims 1 to 6, wherein the antigen-recognition domain recognises an epitope that includes proline at amino acid position 210 of the dysfunctional $P2X_7$ receptor.

8. The chimeric antigen receptor according to any one of claims 1 to 7, wherein the antigen-recognition domain recognises an epitope that includes one or more amino acid residues spanning from glycine at amino acid position 200 to cysteine at amino acid position 216 of the dysfunctional $P2X_7$ receptor.

9. The chimeric antigen receptor according to any one of claims 1 to 8, wherein the signalling domain includes a portion derived from an activation receptor and/or a co-stimulatory receptor.

10. The chimeric antigen receptor according to claim 9, wherein the activation receptor is a member of the CD3 co-receptor complex and/or an Fc receptor.

11. The chimeric antigen receptor according claim 10, wherein the portion derived from the CD3 co-receptor complex is CD3-ζ.

12. The chimeric antigen receptor according claim 10, wherein the portion derived from the Fc receptor is FcεRI or FcγRI.

13. The chimeric antigen receptor according to any one of claims 9 to 12, wherein the co-stimulatory receptor is selected from the group consisting of CD27, CD28, CD30, CD40, DAP10, OX40, 4-1BB (CD137) and ICOS.

14. A nucleic acid molecule including a nucleotide sequence encoding the chimeric antigen receptor according to any one of claims 1 to 13.

15. A nucleic acid construct including a nucleic acid molecule according to claim 14.

16. An ex vivo genetically modified cell, the cell including the chimeric antigen receptor according to of any one of claims 1 to 13, a nucleic acid molecule according to claim 14, or a nucleic acid construct according to claim 15.

17. The ex vivo genetically modified cell according to claim 16, wherein the cell is a leukocyte, a Peripheral Blood Mononuclear Cell (PBMC), a lymphocyte, a T cell, a CD4+ T cell, a CD8+ T cell, a natural killer cell or a natural killer T cell .

18. A pharmaceutical composition including a genetically modified cell according to claim 16 or 17 and a pharmaceutically acceptable carrier.