CLAIMS

1. ~~A~~ Use of a gene vector for the manufacture of a medicament for use in gene therapy for preventing or reducing expression of a nucleotide sequence in a hematopoietic stem cell or a hematopoietic progenitor cell but not in a differentiated cell, ~~comprising~~ wherein the gene vector comprises at least one miRNA target sequence corresponding to a miRNA selected from the group comprising mir-130a and mir-126 operably linked to ~~a~~ the nucleotide sequence.

2. ~~A gene vector~~The use according to claim 1, ~~comprising~~ wherein the gene vector comprises at least one miRNA target sequence corresponding to mir-130a and at least one miRNA target sequence corresponding to mir-126.

3. ~~A gene vector~~The use according to claim 2, wherein the number of copies of the miRNA target sequence corresponding to mir-130a is twice the number of copies of the miRNA target sequence corresponding to mir-126.

4. ~~A gene vector~~The use according to any one of claims 1-3, wherein the nucleotide sequence is a transgene.

5. ~~A gene vector~~The use according to any preceding claim, wherein the vector is a viral vector.

6. ~~A gene vector~~The use according to any preceding claim, wherein the vector is derivable from a lentivirus.

7. ~~A gene vector~~The use according to any preceding claim, wherein the vector comprises a tissue specific promoter.

8. ~~A gene vector~~The use according to claim 7, wherein the tissue specific promoter is selected from the group comprising CD11b, c-Fes and CYBB and TEK.

9. ~~A gene vector~~The use according to claim 7, wherein the tissue specific promoter is a myeloid specific promoter.

10. ~~A gene vector~~The use according to any preceding claim, wherein the nucleotide sequence codes for an enzyme or interferon-alpha.

11. ~~A gene vector~~The use according to claim 10, wherein the enzyme is selected from the group lysosomal enzyme galactocerebrosidase~~,~~ and gp91 phox ~~and interferon-alpha~~.

~~12. A set of DNA constructs for producing a viral vector particle comprising a DNA construct encoding a packagable viral vector genome comprising at least one miRNA target sequence as defined in any one of claims 1 to 3, and optionally a transgene.~~

~~13. A process for preparing a viral vector particle comprising introducing the set of DNA constructs of claim 12 into a host cell, and obtaining the viral vector particle.~~

~~14. A process according to claim 13 wherein the host cell comprises the corresponding miRNA.~~

~~15.~~12. ~~A pharmaceutical composition comprising the gene vector as defined in any one of claims 1-11~~The use according to any preceding claim, wherein the gene vector is in the form of a pharmaceutical composition.

~~16.~~13. ~~A~~ Use of a cell for the manufacture of a medicament for use in gene therapy for preventing or reducing expression of a nucleotide sequence in a hematopoietic stem cell or a hematopoietic progenitor cell but not in a differentiated cell, wherein the cell is infected or transduced with the gene vector as defined in any one of claims 1-11.

~~17.~~14. ~~A cell~~The use according to claim ~~16 which~~13, wherein the cell is a hematopoietic stem cell or a hematopoietic progenitor cell.

~~18. Combination of at least two different miRNA target sequences corresponding to miRNAs selected from the group comprising mir-130a and mir-126.~~

~~19. Combination according to claim 18 wherein the miRNA target sequences are for simultaneous, separate or sequential use.~~

~~20. Use of the vector of any one of claims 1-11, a pharmaceutical composition according to claim 15, a cell according to claims 16-17 or a combination according to claims 18-19 for the manufacture of a medicament for preventing or reducing expression of a transgene in a hematopoietic stem cell or a hematopoietic progenitor cell.~~

~~21.~~15. ~~Use of the gene vector of~~The use according to any ~~one of claims 1-11~~preceding claim, ~~a pharmaceutical composition according to claim 15, a cell according to claims 16-17 or a combination according to claims 18-19 for the manufacture of a~~wherein the medicament is for treating a disease selected from Globoid Cell Leukodystrophy, Chronic Granulomatous Disease Severe Combined Immunodeficiency (SCID) and solid tumours.

~~22.~~16. ~~Use of the gene vector of~~The use according to any one of claims 1-~~11~~14, ~~a pharmaceutical composition according to claim 15, a cell according to claims 16-17 or a combination according to claims 18-19 for the manufacture of a~~wherein the medicament is for increasing the chances of survival of a hematopoietic stem cell or a hematopoietic progenitor cell in relation to gene therapy.

~~23.~~17. ~~Use of the gene vector of any~~The use according to any one of claims 1-~~11~~14, ~~a pharmaceutical composition according to claim 15, a cell according to claims 16-17 or a combination according to claims 18-19 for the manufacture of a~~wherein the medicament is for increasing the safety and/or efficacy of gene therapy.

~~24.~~18. ~~Use of the gene vector of~~The use according to any one of claims 1-~~11~~14, ~~a pharmaceutical composition according to claim 15, a cell according to claims 16-17 or a combination according to claims 18-19 for the manufacture of a~~wherein the medicament is for preventing apoptosis of a hematopoietic stem cell or a hematopoietic progenitor cell, whereby the apoptosis is caused by expression of the transgene.

~~25.~~19. ~~Use of the gene vector of~~The use according to any one of claims 1-~~11~~14, ~~a pharmaceutical composition according to claim 15, a cell according to claims 16-17 or a combination according to claims 18-19 for the manufacture of a~~wherein the medicament is for monitoring a stage of differentiation of a hematopoietic stem cell or a hematopoietic progenitor cell.

~~26.~~20. ~~Use~~ The use according to any ~~one of claims 20-25~~preceding claim, wherein the medicament is for hematopoietic cell therapy.

~~27. Use of a miRNA target sequence corresponding to a miRNA selected from the group of mir-130a and mir-126 for the manufacture of a medicament for use in gene therapy.~~

~~28. A method of determining the differentiation stage of a hematopoietic stem cell or a hematopoietic progenitor cell, comprising determining the level of expression of a miRNA in the cell, wherein the miRNA is selected from the group comprising mir-130a and mir-126.~~

~~29. A method of determining the differentiation stage of a hematopoietic stem cell or a hematopoietic progenitor cell, comprising determining the level of expression of at least two different miRNAs in the cell, and comparing the expression level of the different miRNAs, wherein the miRNAs are selected from the group comprising mir-130a and mir-126.~~

~~30.~~21. A method of determining the differentiation stage of a hematopoietic stem cell or a hematopoietic progenitor cell, comprising determining the expression level of a transgene in said hematopoietic stem cell or said hematopoietic progenitor cell, wherein the transgene is operably linked to a miRNA target sequence, whereby the corresponding miRNA prevents or reduces expression of the transgene in a hematopoietic progenitor cell (HSPC) or a hematopoietic stem cell (HSC) but not in a differentiated cell, wherein the miRNA is selected from the group comprising mir-130a and mir-126.