

CLAIMS

What is claimed is:

1. A method of producing a lentiviral vector, comprising:
 - a. transfecting a mammalian cell with:
 - i. a first nucleic acid encoding a lentiviral regulator of expression of virion proteins (REV) gene under control of a first promoter and an envelope glycoprotein gene under control of a second promoter;
 - ii. a second nucleic acid encoding a gene of interest under control of a third promoter; and
 - iii. a third nucleic acid encoding a lentiviral group specific antigen (GAG) gene and a lentiviral polymerase (POL) gene both under control of a fourth promoter,
 - b. culturing the transfected mammalian cell; and
 - c. isolating the lentiviral vector.
2. The method of claim 1, wherein the mammalian cell is a mammalian cell culture.
3. The method of claim 2, wherein the mammalian cell culture is a suspension culture.
4. The method of claim 1, wherein the mammalian cell is an HEK293T cell.
5. The method of any one of claims 1-4, wherein the envelope glycoprotein gene is a Vesicular Stomatitis Virus Glycoprotein (VSV-G) gene.
6. The method of any one of claims 1-5, wherein the GAG gene is an HIV GAG gene and the POL gene is an HIV POL gene.
7. The method of any one of claims 5-6, wherein the nucleic acids encoding VSV-G and REV are codon-optimized.

8. The method of any one of claims 1-7, wherein the VSV-G gene expression is driven by a Rous sarcoma virus (RSV) promoter.
9. The method of any one of claims 1-8, wherein the REV gene expression is driven by a cytomegalovirus (CMV) promoter.
10. The method of any one of claims 1-9, wherein the gene of interest is a gene of therapeutic interest.
11. A lentiviral vector produced by the method of any one of claims 1-10.
12. A method of treatment with a lentiviral vector, comprising:
 - a. administering the lentiviral vector of claim 11 to a mammalian subject.