

CLAIMS

1. A DNA expression cassette comprising:
 - a. A promoter;
 - b. A sequence encoding the chemokine receptor type 4 CXCR4; and
 - 5 c. A sequence encoding interleukin IL-10.
2. The expression cassette, according to claim 1, characterized in that the sequence encoding the chemokine receptor type 4 CXCR4 is SEQ ID NO: 1 and the sequence encoding interleukin IL-10 is SEQ ID NO: 3.
3. The expression cassette, according to any of the claims 1 or 2, further comprising a
10 regulatory element for increasing transgene expression.
4. The expression cassette, according to any of the claims 1 to 3, wherein the regulatory element is the woodchuck hepatitis virus regulatory element (WPRE) RNA export signal sequence or a functional variant or fragment thereof.
5. The expression cassette, according to any of the claims 1 to 4, further comprising,
15 between the sequence encoding the chemokine receptor type 4 CXCR4 and the sequence encoding interleukin IL-10, a sequence which encodes an autocatalytic peptide.
6. The expression cassette, according to any of the claims 1 to 5, wherein the autocatalytic peptide is E2A, preferably SEQ ID NO: 2.
7. The expression cassette, according to any of the claims 1 to 6, wherein the promoter is
20 a human phosphoglycerate kinase (PGK) promoter sequence or a functional homolog or variant thereof.
8. The expression cassette, according to any of the claims 1 to 7, comprising in the order
25 5' to 3':
 - a. A human phosphoglycerate kinase (PGK) promoter sequence or a functional homolog or variant thereof;
 - b. A sequence encoding the chemokine receptor type 4 CXCR4;
 - c. A sequence encoding the autocatalytic peptide E2A;
 - d. A sequence encoding interleukin IL-10; and
 - 30 e. The woodchuck hepatitis virus post-transcriptional regulatory element (WPRE).

9. The expression cassette, according to any of the claims 1 to 8, comprising in the order 5' to 3':
 - a. A human phosphoglycerate kinase (PGK) promoter sequence or a functional homolog or variant thereof;
 - 5 b. SEQ ID NO: 1 encoding the chemokine receptor type 4 CXCR4;
 - c. SEQ ID NO: 2 encoding the autocatalytic peptide E2A;
 - d. SEQ ID NO: 3 encoding interleukin IL-10; and
 - e. The woodchuck hepatitis virus post-transcriptional regulatory element (WPRE).
- 10 10. A recombinant gene delivery integrative vector comprising the expression cassette of any of the claims 1 to 9.
11. The recombinant gene delivery integrative vector of claim 10 characterized in that it is a lentiviral vector.
12. A cell comprising the expression cassette of any of the claims 1 to 9, or the recombinant gene delivery integrative vector of any of claims 10 or 11.
- 15 13. The cell, according to claim 12, characterized in that it is a mesenchymal stem cell derived from bone marrow, placenta, umbilical cord, amniotic membrane, menstrual blood, peripheral blood, salivary gland, skin and foreskin, synovial fluid, amniotic fluid, endometrium, adipose tissue, cord blood and / or dental tissue.
- 20 14. A pharmaceutical composition comprising the recombinant gene delivery integrative vector of any of claims 10 or 11, or the cell of any of the claims 12 or 13 and, optionally, a pharmaceutically acceptable excipient or carrier.
15. Gene delivery integrative vector of any of claims 10 or 11, or the cell of any of the claims 12 or 13 for use as medicament.
- 25 16. Use of the gene delivery integrative vector of any of claims 10 or 11, or the cell of any of the claims 12 or 13, in the manufacture of a medicament for the treatment of inflammatory diseases.
17. Use of the gene delivery integrative vector of any of claims 10 or 11 or the cell of any of the claims 12 or 13, in the manufacture of a medicament for the treatment of Graft-versus-host disease (GvHD), sepsis, rheumatoid arthritis, or inflammatory bowel disease.
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