Claims

1. A genetically modified mammalian cell that has reduced immunogenicity and/or improved immunosuppression as compared to the mammalian cell without said genetic modification, wherein:
    a. the genetically modified mammalian cell comprises an exogenous nucleic acid comprising: (a) a nucleic acid sequence encoding an HLA-G protein comprising an amino acid sequence of SEQ ID NO:2; and (b) a 3' untranslated region (UTR) comprising a nucleotide sequence of SEQ ID NO:3; and
    b. the encoded HLA-G protein is expressed by the genetically modified mammalian cell for at least six passages in in vitro culture conditions.

2. The genetically modified mammalian cell of claim 1, wherein the HLA-G protein is expressed for at least sixteen passages in in vitro culture conditions.

3. The genetically modified mammalian cell of claim 2, wherein the HLA-G protein is expressed for at least twenty passages in in vitro culture conditions.

4. The genetically modified mammalian cell of claim 1, further comprising an Elongation Factor-1 alpha (EF-la) promoter, wherein the nucleic acid sequence encoding the HLA-G protein is operably linked to the EF-la promoter.

5. The genetically modified mammalian cell of claim 4, wherein the EF-la promoter comprises the sequence of SEQ ID NO:6.

6. The genetically modified mammalian cell of claim 1, wherein the nucleic acid sequence further comprises an EF-1 a promoter comprising SEQ ID NO:6 that is operably linked to the nucleic acid encoding the HLA-G protein.

7. The genetically modified cell of claim 1, wherein the expressed HLA-G is present on the cell surface of the genetically modified mammalian cell.

8. The genetically modified mammalian cell of claim 1, wherein the modified mammalian cell is a human cell.

9. The genetically modified mammalian cell of claim 1, wherein the genetically modified cell is a stem cell, a progenitor cell, a cell obtained by *in vitro* differentiation.

10. The genetically modified mammalian cell of claim 1, wherein the genetically modified cell is a stem cell, a progenitor cell, a cell obtained by in vitro differentiation of the stem cell or the progenitor cell, a fully differentiated cell, an epidermal progenitor cell, a pancreatic progenitor

cell, a hematopoietic stem cell, a keratinocyte, a fibroblast, a hepatocyte, a mesenchymal stem cell, a cardiomyocyte, a neural stem cell, a neuron, or an astrocyte.

11. The genetically modified mammalian cell of claim 1, wherein the genetically modified cell is a human embryonic stem cell, a human mesenchymal stem cell, or a human embryonic epidermal progenitor cell.

12. The genetically modified mammalian cell of claim 1, wherein the genetically modified cell is a human dermal fibroblast.

13. The genetically modified cell of claim 1, wherein the reduced immunogenicity and/or improved immunosuppression of the genetically modified cell as compared to the mammalian cell without said genetic modification is determined by either: (1) a reduction of NK-92 cytotoxicity of the genetically modified cell as compared to the mammalian cell without said genetic modification, (2) a reduction of in vitro peripheral blood mononuclear cell proliferation of the genetically modified cell as compared to the mammalian cell without said genetic modification, and (3) an increase in the size and weight of tumor formation by the genetically modified cell as compared to the mammalian cell without said genetic modification in humanized NSG mice.

14. An artificial tissue comprising the genetically modified mammalian cell of claim 1.

15. A skin graft, repair, or regeneration composition comprising the genetically modified mammalian cell of claim 11.

16. A skin graft, repair, or regeneration composition comprising the genetically modified mammalian cell of claim 12.

17. The genetically modified mammalian cell of claim 1, wherein the exogenous nucleic acid is an expression vector.

18. The genetically modified mammalian cell of claim 17, wherein the expression vector is a transposon vector.

19. The genetically modified mammalian cell of claim 17, wherein the vector further comprises a nucleic acid sequence encoding a reporter protein.

20. An isolated nucleic acid comprising:
    a. a first nucleic acid sequence that encodes an amino acid sequence comprising an amino acid sequence of SEQ. ID NO:2; and

b. a second nucleic acid sequence comprising a nucleotide sequence SEQ. ID NO:3 and operably linked to the first nucleic acid sequence.

21. A mammalian expression vector comprising the isolated nucleic acid of claim 20 and a promoter operably linked to the first nucleic acid sequence, wherein the promoter is not silenced in a stem cell or in a cell generated by differentiation of the stem cell.

22. A cellular or tissue composition comprising a population of genetically modified mammalian cells of claim 1 for use in a method of cellular or tissue repair or regeneration wherein the cellular or tissue composition is suitable for injecting, implanting, or grafting to a subject in need thereof, wherein the subject has at least one mismatched classical HLA class I or HLA class II molecule as compared to the population of genetically modified mammalian cells, and wherein the population of genetically modified mammalian cells exhibits reduced immunogenicity and/or improved immunosuppression as compared to cells of the same-type without the genetic modification.

23. The composition of claim 22, wherein the at least one mismatched classical HLA class I or HLA class II molecule is selected from the group consisting of HLA-A, HLA-B, HLA-C, HLA-DP, HLA-DQ, and HLA-DR.