CLAIMS

1. A method to treat a somatic cell, comprising:

exposing *in vitro* or *ex vivo* the somatic cell to a messenger RNA (mRNA) encoding one or more reprogramming factors,

whereby said exposing achieves expression of the one or more reprogramming factors in the somatic cell to obtain a rejuvenated cell with retention of cellular identity.

2. The method of claim 1, wherein said exposing comprises exposing to an mRNA encoding one or more reprogramming factors selected from the group consisting of Oct4, Sox2, Klf4, cMyc, Lin28, and NANOG.

3. The method of claim 1, wherein said exposing comprises providing a composition comprising the mRNA, wherein the composition comprises an excipient for transfection.

4. The method of claim 3, wherein said composition comprises liposomes, wherein the mRNA is encapsulated in the liposomes.

5. The method of claim 1, wherein said exposing achieves transfection of the mRNA encoding one or more reprogramming factors into the somatic cell.

6. The method of claim 1, wherein said exposing is *ex vivo* and the method further comprises transplanting the rejuvenated cell into a subject.

7. The method of claim 1, wherein said somatic cell is a human cell.

8. The method of claim 7, wherein said human cell is selected from the group consisting of fibroblasts, endothelial cells, connective tissue cells, chondrocytes, skeletal muscle stem cells, muscle cells, nervous system cells, keratinocytes, mesenchymal stem cells, blood cells, and corneal epithelial cells.

9. The method of claim 8, wherein said blood cell is a macrophage, an erythrocyte, a monocyte, a neutrophil, or an eosinophil.

10. The method of claim 7, wherein said human cell is within a tissue or an organ.

11. The method of claim 10, where the tissue or organ is skin, hair, lung, cartilage, or eye.

12. The method of claim 1, wherein said exposing comprises exposing the somatic cell to the mRNA at least once daily for not more than 5 consecutive days.

13. The method of claim 12, further comprising interrupting said exposing and repeating said exposing after said interrupting.

14. The method of claim 1, wherein said exposing comprises exposing the somatic cell to the mRNA at least once daily for between about 2-5 consecutive days.

15. The method of claim 14, further comprising interrupting said exposing and repeating said exposing after said interrupting.

16. A messenger RNA (mRNA) encoding one or more reprogramming factors for use in treating a somatic cell to obtain a rejuvenated cell, the somatic cell after exposure to the mRNA is capable of expression of the one or more reprogramming factors with retention of cellular identify.

17. The use of claim 16, wherein said somatic cell is a human cell.

18. The use of claim 17, wherein said human cell is selected from the group consisting of fibroblasts, endothelial cells, connective tissue cells, chondrocytes, skeletal muscle stem cells, muscle cells, nervous system cells, keratinocytes, mesenchymal stem cells, blood cells, and corneal epithelial cells.

19. The use of claim 18, wherein said blood cell is a macrophage, an erythrocyte, a monocyte, a neutrophil, or an eosinophil.

20. The use of claim 17, wherein said human cell is within a tissue or an organ.

21. The use of claim 20, where the tissue or organ is skin, hair, lung, cartilage, or eye.

22. The use of claim 16, wherein the somatic cell is exposed to the mRNA at least once daily for not more than 5 consecutive days.

23. The use of claim 16, wherein said exposing comprises exposing the somatic cell to the mRNA at least once daily for between about 2-5 consecutive days.

24. The use of claim 22 or claim 23, wherein exposure of the somatic cell to the mRNA is interrupted and then resumed.

25. An mRNA encoding one or more reprogramming factors for use in treating a differentiated cell to obtain a rejuvenated cell, the differentiated cell after introduction of the mRNA capable of expression of the one or more reprogramming factors with retention of its cellular differentiation.

26. An mRNA encoding one or more reprogramming factors for use in treating an age-related disease or condition in a subject with differentiated cells, the differentiated cells after exposure to the mRNA capable of expression of the one or more reprogramming factors to thereby obtain rejuvenated cells with retention of cellular differentiation.

27. The use of claim 26, wherein the age-related disease or condition is a dermatologic disease or condition, an eye disease or condition, a respiratory disease or condition, or a musculoskeletal disease or condition.

28. The use of claim 27, wherein the dermatologic disease or condition is dermal atrophy, dermal elastolysis, skin wrinkling, sebaceous gland hyperplasia, sebaceous gland hypoplasia, senile lentigo, a pigmentation abnormality, graying hair, hair loss, hair thinking or a chronic skin ulcer.

29. The use of claim 27, wherein the eye disease or condition is age-related macular degeneration, glaucoma, a cataract, dry eye, diabetic retinopathy, or vision loss.

30. The use of claim 27, wherein the respiratory disease or condition is pulmonary fibrosis, chronic obstructive pulmonary disease, asthma, chronic bronchitis, pulmonary embolism, lung cancer or a lung infection.

31. The use of claim 27, wherein the musculoskeletal disease or condition is arthritis, osteoporosis, myeloma, gout, Paget's disease, bone fracture, bone marrow failure syndrome, ankyloses, diffuse idiopathic skeletal hyperostosis, hematogenous osteomyelitis, muscle atrophy, peripheral neuropathy, multiple sclerosis, amyotrophic lateral sclerosis, Duchene muscular dystrophy, primary lateral sclerosis, or myasthenia gravis.

32. The use of claim 26, wherein the differentiated cells are exposed to the mRNA at least once daily for not more than 5 consecutive days.

33. The use of claim 32, wherein exposure of the differentiated cells is interrupted and then resumed.

34. An mRNA encoding one or more reprogramming factors for use in treating a cartilage degeneration disorder in a subject, wherein chondrocytes associated with the cartilage degeneration disorder are exposed to the mRNA, the chondrocytes after exposure capable of expression of the one or more reprogramming factors to obtain rejuvenated chondrocytes with retention of cellular differentiation.

35. The use of claim 34, wherein the cartilage degeneration disorder is arthritis.

36. The use of claim 35, wherein the arthritis is osteoarthritis or rheumatoid arthritis.

37. The use of claim 34, wherein exposure of the chondrocytes to the mRNA is *in vivo* or *ex vivo*.

38. The use of claim 37, wherein exposure of the chondrocytes to the mRNA is *ex vivo* and the exposed chondrocytes are transplanted into the subject.

39. The use of claim 34, wherein the chondrocytes are exposed to the mRNA at least once daily for not more than 5 consecutive days.

40. The use of claim 39, wherein the exposure is interrupted and then resumed.