CLAIMS:

1. An *ex-vivo* method for inducing extended self-renewal of functionally differentiated somatic cells comprising a step of activating expression of a Myc family gene and a Klf family gene in said cells.

2. The method according to claim 1, wherein a vector encoding for a Myc family gene and/or a Klf family gene is used.

3. The method according to claim 2, wherein the vector is a viral vector.

4. The method according to claim 3, wherein the viral vector is a retroviral vector.

5. The method according to claim 4, wherein the retroviral vector is a lentiviral vector.

6. The method according to claim 3, wherein the viral vector is an adenoviral vector.

~~7. An *ex-vivo* method for extended self-renewal of functionally differentiated somatic cells comprising a step of contacting said cells with a Myc family protein and a Klf family protein.~~

~~8.~~7. The method according to anyone claims 1 to ~~7~~6, wherein the Myc family gene ~~or protein~~ is c-Myc.

~~9.~~8. The method according to anyone claims 1 to ~~7~~6, wherein the Klf family gene ~~or protein~~ is Klf4.

~~10.~~9. The method according to anyone claims 1 to ~~9~~8, wherein the Myc family gene ~~or protein~~ is c-Myc and the Klf family gene ~~or protein~~ is Klf4.

~~11.~~10. The method according to anyone claims 1 to ~~10~~9, wherein the functionally differentiated somatic cells are selected in the group consisting of epidermal cells, epithelial cells, keratinocytes, neurons, glia cells, chondrocytes, pancreatic endocrine cells, hepatocytes, endothelial cells, hematopoietic cells (including erythrocytes, lymphocytes, monocytes, macrophages and dendritic cells), cardiac muscle cells and other muscle cells, osteoblasts and osteoclasts.

~~12. The method according to claim 1 or claim 7 comprising a step of contacting said cells with biological or chemical compounds mimicking a Myc family protein and a Klf family protein activity.~~

~~13. The method according to the claim 12, wherein said biological or chemical compounds mimic c-Myc and Klf4 protein activity.~~

~~14. The method according to the claim 13, wherein said chemical compound mimicking Klf4 protein activity is a chemical compound belonging to the paullones structural class.~~

~~15. The method according to the claim 13, wherein said biological or chemical compounds mimicking c-Myc protein activity is a compound activating the Wnt pathway signalling.~~

~~16. The method according to the claim 13, wherein said chemical compound activating the Wnt pathway signalling is a chemical compound belonging to the 5-thiophenepyrimidine class.~~

~~17. The method according to claim 1, wherein biological or chemical compounds activating expression of a Myc family gene and a Klf family gene are used.~~

~~18. The method according to claim 17, wherein said biological or chemical compounds activate expression of c-Myc and Klf4.~~

~~19. The method according to claim 17, wherein said biological or chemical compounds activate expression of c-Myc and Klf4 are an activator of the signal transducer and activator of transcription 3 (STAT3).~~

~~20.~~11. A combination of a Myc family member ~~(~~gene ~~or protein)~~ and a Klf family member ~~(~~gene ~~or protein)~~ for use in a method for inducing extended self-renewal of functionally differentiated somatic cells.

~~21.~~12. A kit comprising a Myc family member ~~(~~gene ~~or protein)~~ and a Klf family member ~~(~~gene ~~or protein)~~ for use in a method for inducing extended self-renewal of functionally differentiated somatic cells.

~~22.~~13. A population of functionally differentiated somatic cells obtainable by a method according to anyone of claims 1-~~19~~10.

~~23.~~14. A pharmaceutical composition comprising a population of functionally differentiated somatic cells according to claim ~~22~~13 and a pharmaceutically acceptable carrier or excipient.