However, international patent application WO 2008/084069 recently discloses a method for generating, maintaining and expanding monocytes and macrophages in long term culture by inhibiting the expression or the activity of MafB and c-Maf in said cells; and expanding the cells in the presence of at least one cytokine, such as M-CSF.

Now, the inventors have underlined that such method is based on a mechanism that depends on regulated activation of c-Myc and Klf4 and have surprisingly demonstrated that long term proliferating cells thus obtained are not tumorigenic despite the fact that c-Myc and Klf4 are both oncogenes as described in Rowland *et al.* 2006 and Adhikary *et al.* 2005.

SUMMARY ~~OF THE INVENTION~~:

Therefore, ~~a first aspect~~an embodiment of the ~~invention~~disclosure relates to a 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.

In one aspect, there is provided 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, wherein said functionally differentiated somatic cells are hematopoietic cells.

~~A second aspect~~Another embodiment of the ~~invention~~disclosure relates to a method for inducing 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.

~~A third aspect~~An embodiment of the ~~invention~~disclosure relates to 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.

In one aspect, there is provided a combination of a Myc family member gene and a Klf family member gene for use in a method for inducing extended self-renewal of functionally differentiated somatic cells, wherein said functionally differentiated somatic cells are hematopoietic cells.

The ~~invention~~disclosure also relates 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.

In one aspect, there is provided a kit comprising a Myc family member gene and a Klf family member gene for use in a method for inducing extended self-renewal of functionally differentiated somatic cells, wherein said functionally differentiated somatic cells are hematopoietic cells.

The ~~invention~~disclosure also relates to the use of a Myc family gene or protein and a Klf family gene or protein for inducing extended self-renewal of functionally differentiated somatic cells.

The ~~invention~~disclosure further relates to a population of functionally differentiated somatic cells obtainable by the method of the ~~invention~~disclosure and a pharmaceutical composition comprising such population and a pharmaceutically acceptable carrier or excipient.

In one aspect, there is provided a population of functionally differentiated somatic cells, wherein said functionally differentiated somatic cells are hematopoietic cells obtainable by a method as defined above.

In one aspect, there is provided a pharmaceutical composition comprising a population of functionally differentiated somatic cells, wherein said functionally differentiated somatic cells are hematopoietic cells as defined above and a pharmaceutically acceptable carrier or excipient.

DETAILED DESCRIPTION OF THE INVENTION:

The inventors have thus demonstrated that it was possible to obtain functionally differentiated somatic cells in large quantity without passing through pluri- or multi-potent stem cell intermediates and without malignant transformation by inducing the extended self-renewal of said functionally differentiated somatic cells by activating expression of c-Myc