

## **Patent WO/2006/029494) EXTRACTION OF GROWTH AND DIFFERENTIATING FACTORS FROM COLOSTRUM**

Interestingly, even growth factors from non-human origin, such as those derived from porcine or bovine **colostrum**, when converted into their active forms, have been found to be active on human **cells**. This can be explained by the fact that the active forms of smaller molecular weight are almost completely homologous to the corresponding human growth factors. This has been found to be the case for the following families of factors, for example: IGFs (1-3), TGFs  $\beta$  (1-3), PDGFs (AA, AB, BB), and BMPs (1-24). These factors, when in active form, are recognized for their ability to proliferate and/or differentiate the **stem cells** of a newborn.

## **THE EFFECT OF A COLOSTRUM EXTRACT OF PROLINE RICH POLYPEPTIDES (PRP) ON IMMUNE STATUS IN GUINEA PIGS AND ITS IMPLICATIONS ON THE POTENTIAL OF PRP IN AGING HUMANS**

Growth factors in **colostrum** help activate **stem cells**. The potential for growth factors in the adult to help signal growth, repair and regeneration of tissue, especially when combined with **stem** cell therapy, has garnered much interest recently.

These growth factors include growth hormone (GH), insulin type growth factor (IGF-1), insulin type growth factor (IGF-2), transforming growth factor (TGF-alpha), transforming growth factor (TGF-beta), epidermal-GF, fibroblast-GF, and platelet-derived-GF.

The following is a list of all growth and differentiating factors detected by ELISA tests built in with factors of human origin as standards. (See also Figure 3.)

BMP-2: bone morphogenic protein 2 BMP-4: bone morphogenic protein 4 EGF: epidermal growth factor FGF-2: (basic) fibroblast growth factor basic FGF-4: fibroblast growth factor 4 HGF: hepatocyte growth factor IGF-1 : insuline-like growth factor 1 IGFBP-1 : insuline-like growth factor binding protein 1 IGFBP-3: insuline-like growth factor binding protein 3 KGF (FGF-7): keratinocyte growth factor PDGF-AA: platelet-derived growth factor-AA PDGF-AB: platelet-derived growth factor-AB PDGF-BB: platelet-derived growth factor-BB PLGF: placenta growth factor **SCF: stem cell factor** c-kit ligand TGF- $\alpha$ : transforming growth factor alpha TGF- $\beta$ 1 : activated transforming growth factor beta 1 TGF- $\beta$ 2: activated transforming growth factor beta 2 TNF $\alpha$ : tumor necrosis factor alpha TNF $\beta$ : tumor necrosis factor beta VEGF: vascular endothelial growth factor

Example 1 : Extraction of Growth and Differentiating Factors from Commercially Available Bovine **Colostrum**. The process of the invention, shown schematically in Figure 1 (A) & (B), will now be described.

## **Frequently Asked Questions**

### **1. What is a stem cell?**

A stem cell is a cell that has the ability to duplicate itself endlessly and to become cells of virtually any organ and tissue of the body. Embryonic stem cells are cells extracted from the blastula, the very early embryo, that have an exceptional ability to duplicate in vitro, that is in a test tube, and to become cells of almost any tissue.

Adult stem cells are cells found in an organism after birth. Until very recently, it was believed that adult stem cells could only become blood cells, bone and connective tissue. But recent development over the past five years has revealed that adult stem cells have capabilities similar to embryonic stem cells.

### **2. What is the Stem Cell Theory of Renewal?**

The Stem Cell Theory of Renewal proposes that stem cells are naturally released by the bone marrow and travel via the bloodstream toward tissues to promote the body's natural process of renewal. When an organ is subjected to a process that requires renewal, such as the natural aging process, this organ releases compounds that trigger the release of stem cells from the bone marrow.

The organ also releases compounds that attract stem cells to this organ. The released stem cells then follow the concentration gradient of these compounds and leave the blood circulation to migrate to the organ where they proliferate and differentiate into cells of this organ, supporting the natural process of renewal.