



HEALTHY CHOICES

Latest tips on the art of living well.

ISSUE: 10 2012

Healthy Stem Cells

Part 1: What are stem cells?



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Your body is made up of about 100 trillion cells that are continually dying and being replaced. As you get older your ability to replace cells can be impaired by the natural ageing process, your diet, lifestyle and environment.

The formation of a cell is a complex affair, essentially an undifferentiated stem cell develops into a specialised (or differentiated) cell which then becomes part of a tissue or organ and has a special, distinct function in the body.

While the undifferentiated (or stem) cells may not sound very useful, they are in fact very clever and essential for the ongoing rejuvenation of our body. There are a few types of stem cells in our bodies, from these a whole range of specialised cells can be formed - for example - mesenchymal stem cells, found in bone marrow, adipose (fatty) tissue, lungs, placenta and umbilical cord have the ability to turn into bone cells (osteoblasts), cartilage cells (chondrocytes) and fat cells (adipocytes).

There are two main sources of human stem cells that you may have heard about in the media:

1. **Embryonic stem cells** - derived from destroyed embryos, this source of stem cells is highly controversial.
2. **Adult stem cells** - these cells are present in all people, although they do diminish in both number and activity as we age. Most commonly, therapy uses the hosts own stem cells making this a much less controversial source.

Today's focus is on healthy ageing and increasingly more people are seeking support for the body's natural repair and rejuvenation processes. Stem cell science has radically shifted the focus of health from the management of disease to the repair of cells through supporting the body's natural cellular repair mechanism and regeneration of tissue from the inside out.

Modern stem cell therapy includes procedures that extract mesenchymal stem cells from the patient's own adipose tissue, cultivates them and then injects them back into their body - commonly into joints to assist in the repair process of damaged cartilage.

While such medical advances are remarkable, it can still be said that a gram of prevention is worth a tonne of cure. Fortunately more and more is being learned about what influences stem cell health.

There are 5 key elements that measure efficient stem cell development:

1. **Release** - from the bone marrow (or other tissue) into the circulation.
2. **Migration** - chemical signals from the immune system direct the stem cells to the target tissues (where regeneration is required).
3. **Engraftment** - once at the target tissue they need to be incorporated into the tissue/organ.
4. **Differentiation** - a vital aspect, the stem cell specialises into a functional cell that is specific to the organ it has migrated to (e.g. heart cell, liver cell, nerve cell, cartilage cell etc).
5. **Viability** - the health of the stem cell, its environment both where it begins and the target tissue where it ends up.

Taking a supplement that claims to increase the numbers of circulating stem cells will not necessarily translate as optimal activity or benefit. You must aim to support the whole body and all five elements in the stem cell process (stem cell cascade).

Part 2 of Healthy Stem Cells focuses on factors that support healthy stem cells, including important diet and lifestyle habits.