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As We SEE IT

Stem Cell Therapy in a Pill?

By William Faloon

In November 2001, Dr. Michael West made a startling announcement. Dr. West's laboratory, Advanced Cell Technology, had just created the first human embryonic stem cells, and this breakthrough had been published in the *Journal of Regenerative Medicine*.

Dr. West's announcement became instant headline news around the world. Scientists at Advanced Cell Technology made it clear that their intention was "not to create cloned human beings, but rather to make lifesaving therapies for a wide range of human disease conditions, including diabetes, strokes, cancer, AIDS, and neurodegenerative disorders such as Parkinson's and Alzheimer's disease."¹

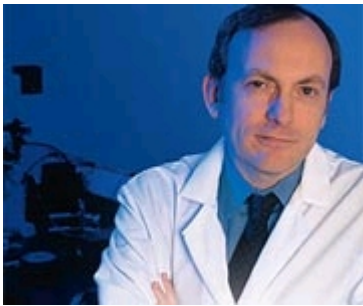
Instead of heralding Dr. West's discovery as a major scientific advance, the federal government tried to outlaw human embryonic stem cell research altogether. While the government failed to enact criminal penalties against stem cell scientists, it did manage to ban embryonic stem cell research in facilities that received government funding.² The result of this prohibition is that very few stem cell therapies are available to the millions of Americans whose lives might otherwise be saved by them.

For the past five years, longevity enthusiasts have deluged Congress with letters seeking to lift the ban on embryonic stem cell research.



by William Faloon

NUTRIENTS PROMOTE STEM CELL PROLIFERATION



The tissue that scientists most associate with adult stem cell activity is the bone marrow. Each day, stem cells in the bone marrow evolve to produce red blood cells, white blood cells, and platelets. These mature cells are then released into the bloodstream where they perform their vital life-supporting functions.

When bone marrow stem cell activity is interfered with, diseases such as anemia (red blood cell deficit), neutropenia (specialized white blood cell deficit), or thrombocytopenia (platelet deficit) are often diagnosed. Any one of these conditions can cause death if not corrected.

Scientists have long known that folic acid, vitamin B12, and iron are required for bone marrow stem cells to differentiate into mature red blood cells.³⁻⁷ Vitamin D has been shown to be crucial in the formation of immune cells,⁸⁻¹¹ whereas carnosine has demonstrated a remarkable ability to rejuvenate cells approaching senescence and extend cellular life span.¹²⁻²⁸

Other studies of foods such as blueberries show this fruit can prevent and even reverse cell functions that decline as a result of normal aging.²⁹⁻³⁶ Blueberry extract has been shown to increase neurogenesis in the aged rat brain.^{37,38} Green tea compounds have been shown to inhibit the growth of tumor cells, while possibly providing protection against normal cellular aging.^{39,40}

Based on these findings, scientists are now speculating that certain nutrients could play important roles in maintaining the healthy renewal of replacement stem cells in the brain, blood, and other tissues. It may be possible, according to these scientists, to use certain nutrient combinations in the treatment of conditions that warrant stem cell replacement.⁴¹⁻⁴³

THEORIES PUT TO THE TEST

To test the hypothesis that nutrients may promote healthy stem cell proliferation, scientists screened a wide range of whole-food extracts, herbal extracts, and specific compounds.⁴³ The objective was to promote hematopoietic stem cell proliferation. Hematopoietic stem cells are adult stem cells that are used routinely for bone marrow transplantation. They reside in bone marrow and are capable of generating all cell types of the blood and immune system.



In this study, spinach, spirulina, astragalus, and other plant compounds did not show a high activity for promoting human bone marrow cell proliferation. Blueberry, green tea, vitamin D3, and carnosine, however, were found to increase bone marrow cell activity in a dose-dependent manner.⁴³

A common side effect of cancer chemotherapy drugs is bone marrow damage, leading to immune suppression and other blood disorders. Medical oncologists routinely prescribe expensive drugs such as granulocyte-macrophage colony-stimulating factor (GM-CSF)—which is also naturally produced by the bone marrow—to stimulate bone marrow stem cell activity. These drug treatments are not without risks of side effects.⁴⁴

The scientists in this study used GM-CSF as a positive control from which to evaluate the stem cell-promoting effects of various nutrient combinations. As expected, GM-CSF increased bone marrow cell proliferation by around 46%, which was better than any single nutrient compound tested.⁴³

When combinations of nutrients were tested, however, a greater percentage of bone marrow cell proliferation occurred compared to GM-CSF. For example, a combination of blueberry and vitamin D3 exhibited a 62% increase in proliferation of bone marrow cells.⁴³ Blueberry and catechin (green tea extract) increased bone marrow cell proliferation by 70%. When carnosine and blueberry were combined, the growth promotion observed was 83% . . . an effect significantly greater than that of the expensive drug GM-CSF!⁴³



Green tea leaves

The scientists next tested various nutrients on early stem cells, which can be identified and isolated by their surface antigen-receptor expressions (e.g., CD34 + and CD 133 +). The GM-CSF drug increased these early stem cells by 48%, as expected. A combination of blueberry, green tea, vitamin D3, and carnosine, however, increased these stem cells by an astounding 68%.⁴³

These studies, published just this year, demonstrate for the first time that various natural compounds can promote the proliferation of human bone marrow cells and human stem cells. While these studies were done in vitro, they provide evidence that readily available nutrients may confer a protective effect against today's epidemic of age-related bone marrow degeneration.

WHAT THESE STUDIES MEAN TO AGING ADULTS

People afflicted with degenerative illnesses have endured daily suffering that could have been treated effectively had embryonic stem cell research not been stymied by our own government.

Elderly people endure defective immune function that makes them vulnerable to infectious disease, cancer, and chronic inflammatory conditions. Anemia is so prevalent among the elderly that doctors routinely overlook life-threatening red blood cell deficiencies in their older patients, which results in needless heart and brain damage.⁴⁵

Embryonic stem cells are capable of generating all differentiated cell types in the body. If embryonic stem cell therapies were readily available today, the incidence of a number of age-related diseases would plummet. Regrettably, federal bureaucracies have stifled the advancement of human therapeutic embryonic stem cell research, and caused millions of Americans to suffer and die needlessly.

A few scientists have begun to experiment with the use of adult (bone marrow) stem cells to help treat a wide variety of diseases. Adult stem cells are often tissue-specific and can generate only the cell types comprising a particular tissue in the body; however, in some cases, they can trans-differentiate into cell types found in other tissues. Unfortunately, these therapies have not yet been fully developed and are largely unavailable to the vast majority of Americans.⁴⁶



The encouraging news is that many of the nutrients that Life Extension members already use may serve to maintain youthful bone marrow stem cell production. It would be fascinating to see a clinical trial in aging humans to determine whether ingesting vitamin D3, blueberry, green tea, and carnosine can reverse anemia, immune deficiencies, and other bone marrow disorders.

For longer life,

Handwritten signature of William Faloon.

William Faloon

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