A blend of an extract from *Aphanizomenon flos-aquae*, fucoidan from Undaria pinnatifida and an extract from Polygonum multiflorum leads to a significant mobilization of bone marrow stem cells.

Introduction

The effect of a proprietary extract of *Aphanizomenon flos-aquae* (AFA) on bone marrow stem cell mobilization was discovered after reports that consumption of AFA led to a broad variety of health benefits touching various aspects of human health. It was then hypothesized that an effect on bone marrow stem cell mobilization could offer a mechanism of action explaining the wide variety of benefits in various individuals. Testing revealed that AFA contained an L-selectin blocker and that an AFA Concentrate called StemEnhance® was able to trigger a significant release of stem cells from the bone marrow, as measured by an increase in the number of circulating stem cells.

Following this discovery and the development of StemEnhance, we investigated the effect on bone marrow stem cell mobilization of other plants historically associated with broad varieties of benefits touching various aspects of human health. Of these plants, two were found to support stem cell mobilization and to lead to a significant increase in the number of circulating stem cells: fucoidan from Undaria pinnatifida and Polygonum multiflorum.

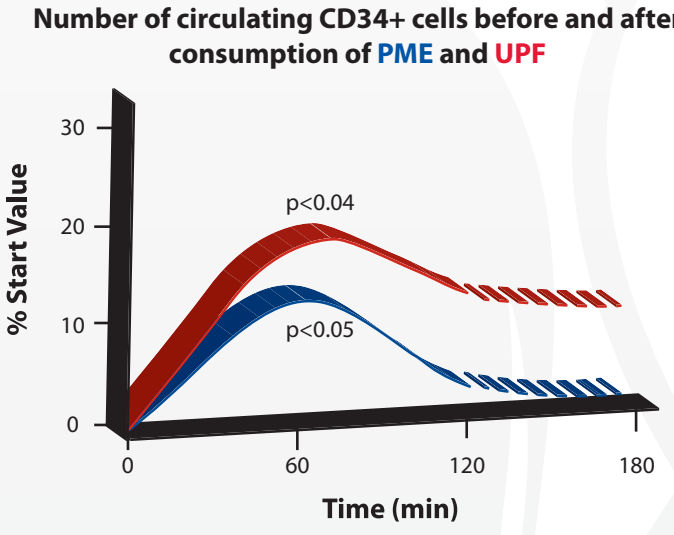
The objective of this study was to evaluate the effects of a product called SE2™, which is a blend made of an extract from the cyanophyta *Aphanizomenon flos-aquae*, fucoidan from brown seaweed Undaria pinnatifida (UPF) and an extract from the knotweed Polygonum multiflorum (PME) on the mobilization of bone marrow stem cells.

Methods & Results

Effect of UPF and PME on stem cell mobilization

Oral intake of UPF has already been documented to lead to a mild increase in the number of circulating stem cells after 2 weeks of daily consumption. In this study we tested, using a double-blind cross-over paradigm, the effect of UPF on stem cell mobilization by quantifying the number of circulating CD34+ stem cells 30, 60 and 120 minutes after ingestion of 250 mg of UPF or placebo.

Consumption of UPF triggered a significant increase in the number of circulating CD34+ stem cells which, contrary to AFA extract, was still significantly above baseline levels 2 hours after consumption. Polygonum multiflorum has been documented to support stem cell proliferation in vitro, however no effect in vivo has ever been reported. We documented that consumption of PME led to a transient but significant increase in the number of circulating CD34+ stem cells.

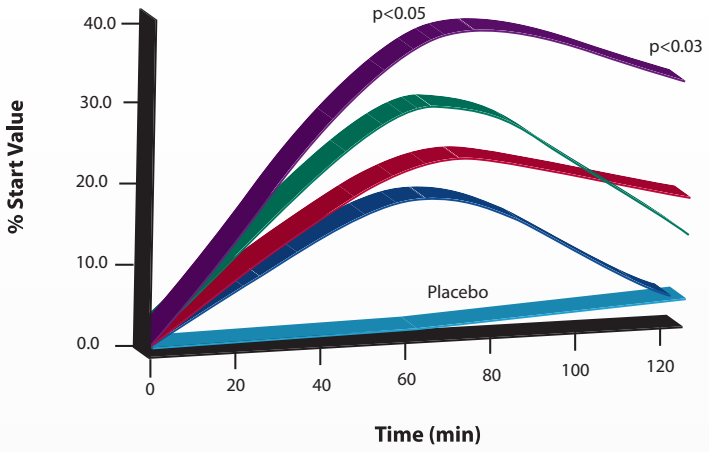


Stemtech
The Stem Cell Nutrition Company®

Effect of SE2, a blend of AFA extract, UPF and PME on stem cell mobilization

It was hypothesized that blending AFA extract with UPF and PME could lead to an increase in the number of circulating stem cells that would be comparable to AFA extract alone but would last longer due to the effect of UPF. Consumption of SE2 actually revealed a synergistic effect between the ingredients with a greater maximum increase in the number of circulating stem cells after one hour and an effect that was still significantly above baseline levels 2 hours after consumption. The SE2 formula also contains Cordyceps sinensis, which was seen in preliminary trials to further enhance the effect of the formula.

Number of circulating CD34+ cells before and after consumption of SE, PME, UPF and SE2



Discussion

Dietary strategies for supporting stem cell biology represent an emerging field of nutritional and medical research. We have previously documented that consumption of an L-selectin ligand rich extract of the cyanobacterium AFA leads to a significant increase in the number of circulating stem cells. Here we document in a double-blinded placebo-controlled cross-over study that two other natural compounds that have been historically associated with a broad range of health benefits also exert their health benefits, at least in part, by supporting stem cell release from the bone marrow.

Data pertaining to AFA extract was originally published by reporting the maximal increase in the number of circulating stem cells at approximately 60 minutes after consumption. However, this manner of reporting the data underestimates the actual total number of stem cells released from the bone marrow, which would be more accurately estimated by measuring the area under the curve. Using this approach reveals that even though the maximum increase in the number of circulating stem cells induced by UPF may be lower than the response obtained with AFA extract, the longer lasting effect could be associated with a larger total number of released stem cells. Likewise, using this approach reveals that the total number of released stem cells is significantly superior with SE2 than with AFA extract alone.

A growing body of scientific evidence suggests a direct link between health maintenance and the number of circulating stem cells; the higher the number of circulating stem cells, the greater the body's ability to maintain optimal health. This data also points to the potential role of stem cell mobilizers in health maintenance.

Number of circulating CD34+ cells before and after consumption of SE, PME, UPF and SE2