



RESEARCH STUDIES ON ANTI-CANCER AND  
ANTI-INFLAMMATORY EFFICACY AND SAFETY OF  
YOUNGEVITY® NUTRACEUTICAL PRODUCTS



CLEMSON  
UNIVERSITY

INSTITUTE OF NUTRACEUTICAL RESEARCH





For over 15 years, **Youngevity®** has continued a tradition of excellence and innovation with its Nutraceutical products by committing itself to research and science. Its core message of **90 For Life™**, developed by world-renowned scientist and researcher, Dr. Joel Wallach, has resonated and enhanced the lives of millions through its clinically-supported philosophy of the correlation of specific nutrients to overall health and wellness.

Working closely with the field's most notable biochemists, medical professionals, nutritionists and governmental organizations such as the Food and Drug Administration (FDA), Youngevity® has pioneered the use of nutrition and supplementation to aid in the support of health and defense of the body's most debilitating health concerns.



# CLEMSON® UNIVERSITY

## INSTITUTE FOR NUTRACEUTICAL RESEARCH

**Clemson University** is one of the nation's most prominent and respected academic institutions. The **Institute of Nutraceutical Research (INR)** is the national leader in nutritional research and one of its missions is to provide consumers greater confidence in product quality, safety, and efficacy.

With over 100 scientists working in various fields of medicine, nutrition, and science, INR is focused on using its vast knowledge base, innovation and cutting-edge technology, and experience to accurately assess the value of various ingredients and Nutraceuticals.

## Youngevity® Essential Life Sciences Initiates Clinical Studies at Clemson University's Institute of Nutraceutical Research

### Studies Will Evaluate Potential Effects of Youngevity® Products on Human Biomarkers

Youngevity® contracted Clemson University's Institute of Nutraceutical Research to identify the potential benefits of two of its products, **Beyond Tangy Tangerine®** and **Ultimate Classic®**. Youngevity's mission was to truly understand and clinically substantiate the health promoting benefits of these two products. Using Clemson – INR as a complete 3rd party researcher and academic university with no direct relationship, Youngevity® sought a fully unbiased perspective and evaluation of their products.

Multiple studies were recommended by Clemson scientists to provide a comprehensive evaluation of the Youngevity® products. Specific biomarkers were chosen to study in the areas of Safety, Inflammation, and the treatment of various Cancer Cells.

EXCERPT FROM THE ORIGINAL YOUNGEVITY® PRESS RELEASE, JULY 2012

FOR IMMEDIATE RELEASE  
July 9, 2012

**Youngevity® Essential Life Sciences Initiates Clinical Studies at Clemson University's Institute of Nutraceutical Research. Studies Will Evaluate Potential Effects of Youngevity® Products on Human Biomarkers**

**SAN DIEGO, CA** – Growing demanding consumers' Youngevity® Essential Life Sciences (www.Youngevity.com) announces it has signed an agreement to initiate a series of clinical research studies at Clemson University's Institute of Nutraceutical Research. The study, titled "Research Studies on Anti-Cancer and Anti-Inflammatory Efficacy and Safety of Nutraceutical Research," is formally titled "Research Studies on Anti-Cancer and Anti-Inflammatory Efficacy and Safety of Youngevity® Nutraceutical Products," the research will be overseen by Professor Chittaranjan Kole, Director of Research at the Institute, who is a specialist in diet, genomics, phytochemistry and nutraceuticals. Youngevity® Essential Life Sciences is wholly owned subsidiary of AL International (www.alintl.com), a global marketer of lifestyle and nutritional products and services and gourmet coffee.

The placebo-controlled, validation research studies will not be tested in humans, however will be testing specific human biomarkers, including inflammation, bacterial, and disease management. Products featured in Youngevity's "90 for Life" campaign, including its signature "90 Essential Nutrients" blend, will be used primarily in these early studies. The research will build on work performed by Youngevity® cofounder Dr. Joel Wallach over the course of 30 years. The Clemson University studies will begin immediately and will conclude by the end of 2012. Youngevity® expects to continue to work with a variety of academic and private organizations to further study the potential effects of its products on various health markers.

"We are excited to work with Youngevity®," said Dr. Kole. "Research such as the studies that Youngevity® is performing further the mission of this Institute and the entire field of Nutraceuticals. This is a very exciting time for all of us."

Clemson University serves as one of the leading research universities in the U.S. The mission of the Institute of Nutraceutical Research is to make Clemson the national leader in nutritional research, its goal is to develop greater confidence in product quality, and effectiveness, and to enhance consumer demand for quality nutraceutical products. The Institute is one of the most highly regarded organizations in the field of phytochemicals, vitamins and minerals.

Steve Wallach, CEO of Youngevity®, said, "We are looking forward to working with Dr. Kole at Clemson University to perform these clinical research studies, which will allow us to study potential links between our products and various biomarkers. Among the top universities and academic facilities we considered, Clemson had the greatest expertise in this area, and they are consistently innovating in the areas of nutrition and nutraceuticals."

Dr. Wallach, co-founder of Youngevity®, said, "Youngevity® products have always been deeply rooted in solid science. As a physician and medical researcher, I always said this is my ultimate guide in formulating and developing products. Dr. Wallach's research with respected and reputable academic institutions such as Clemson extends our commitment to provide the best products to our distributors and consumers."

**About Youngevity®**  
Youngevity® Essential Life Sciences (www.Youngevity.com), headquartered in San Diego, CA, is a nutrition and lifestyle-related services company dedicated to promoting vibrant health and flourishing ecosystems. Founded in 1997 by Drs. Joel Wallach, DVM, ND, and Mia Lar, MD, at Global, Inc., the company adopted the name Youngevity® in 2006. Youngevity is the only network marketing company to have a qualified FDA Health Claim. Dr. Wallach's work has been published in more than 70 peer-reviewed and referenced scientific journals and books.

**About AL International**  
AL International, Inc. (ALCOFF) (www.alintl.com) is a fast-growing, innovative, multi-dimensional company that offers a wide range of consumer products and services, primarily through person-to-person selling relationships that comprise a network of networks. The company also is a vertically integrated producer of the finest coffee for the commercial, retail and direct sales channels. AL International was formed after the merger of Youngevity® Essential Life Sciences (www.Youngevity.com) and Lavazza Coffee Company in the summer of 2011.

**Safe Harbor Statement**  
The information contained in this press release represents our current expectations and projections about future events, in some cases based on assumptions that can be identified by reasonable persons. These statements are based on current beliefs, estimates and projections and are subject to a number of risks and uncertainties, and other factors, many of which are beyond our control. These statements are based on current beliefs, estimates and projections and are subject to a number of risks and uncertainties, and other factors, many of which are beyond our control. These statements are based on current beliefs, estimates and projections and are subject to a number of risks and uncertainties, and other factors, many of which are beyond our control. These statements are based on current beliefs, estimates and projections and are subject to a number of risks and uncertainties, and other factors, many of which are beyond our control.





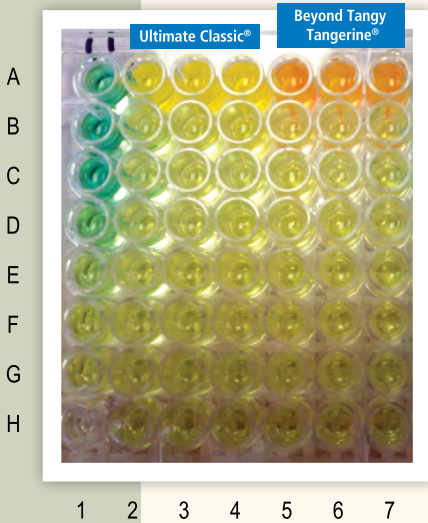
# SAFETY

Dietary supplement safety is the most highly-regarded aspect of the Youngevity® products. Through the most stringent manufacturing and production, at all stages and conditions, dietary supplement safety has become synonymous with the Youngevity® name and brand. Although Youngevity® only uses nutrients that are beneficial to the body and in forms that are highly bioavailable, Youngevity® felt it was important to show empirically the range and degree of safety through looking at (3) factors – **Genotoxicity, Anti-Genotoxicity, and Anti-Mutagenicity.**



## GENOTOXICITY RESULTS

**Genotoxicity:** When a nutrient and/or product is “genotoxic” it causes things such as cells, DNA, and other genetic material to be harmed. The three primary effects it can have is that it can be carcinogenic, or cancer-causing; mutagenic, causing cells to not develop properly; or teratogenic, causing birth or growth defects.



## STUDY ONE (SOS-CHROMOTEST-GENOTOXICITY):

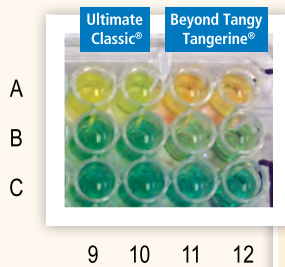
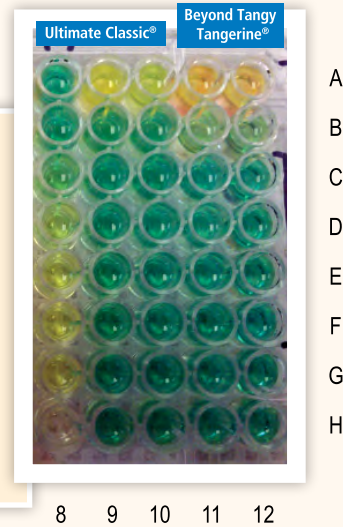
A sensitive and demonstrative bacteria, *Escherichia coli*, was exposed to various levels of Beyond Tangy Tangerine® and Ultimate Classic® and was analyzed to determine if the products are genotoxic (shown by the indication of blue color) or non-genotoxic (shown by the indication of yellow color).

**Result:** Beyond Tangy Tangerine® and Ultimate Classic® at various concentrations did not show detectable genotoxicity. There was no observable or identifiable toxin that was produced after administering Beyond Tangy Tangerine® or Ultimate Classic® to healthy test bacteria.

## STUDY TWO (SOS-CHROMOTEST-ANTI-GENOTOXICITY/PROTECTIVE):

The healthy genes/bacteria of *E. coli* were administered Beyond Tangy Tangerine® and Ultimate Classic® and then a known genotoxin, 4-Nitroquinoline 1-Oxide (4-NQO), to examine whether the products had any protective effects.

**Result:** When the toxin was administered to healthy test bacteria, Beyond Tangy Tangerine® and Ultimate Classic® reduced the amount of genotoxicity to the cells. The lack of blue color (which indicates a genotoxic environment) when known toxins were placed in the vial, indicates that Beyond Tangy Tangerine® and Ultimate Classic® protect genes/bacteria from damage.



## STUDY THREE (SOS-CHROMOTEST-ANTI-GENOTOXICITY/METABOLIZING):

Does Beyond Tangy Tangerine® and/or Ultimate Classic® decrease the amount or availability of toxin (4-NQO) in the genotoxic environment?

**Result:** After 90 minutes, the genotoxic environments where Beyond Tangy Tangerine® was present showed less toxin (4-NQO). This indicates that with time, Beyond Tangy Tangerine® may help to metabolize or sequester the toxin.



# INFLAMMATION

Some medical professionals and researchers feel that chronic inflammation may be one of the deadliest conditions of the body; the root and breeding ground of illness and disease. Acutely and in small amounts, inflammation is very helpful, activating infection-fighting mechanisms. However, low-grade and chronic inflammation has researchers believing it is the “unified field theory” of all disease and illness. This type of inflammation is associated with issues such as heart disease, diabetes, arthritis and joint pain, obesity, autoimmune diseases, neurological issues, and even the cause of chronic disease. The solution to the problem of chronic inflammation and its link to the world’s most debilitating health issues is being actively sought by researchers worldwide.

## PRO-INFLAMMATORY AND ANTI-INFLAMMATORY RESULTS

**Inflammation:** a protective and destructive response of the body in response to injury and infection. When chronic, inflammation can override the immune system modulator causing destruction to healthy tissue, cells, and DNA.

### STUDY ONE (LTB4 AND PGH2 TEST-PROINFLAMMATORY RESPONSE):

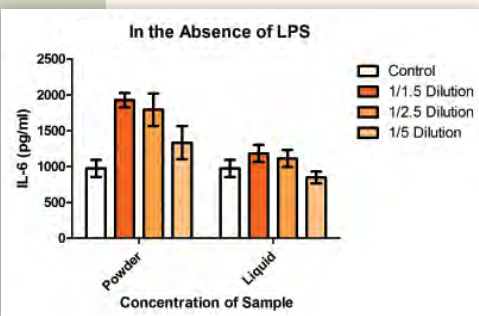
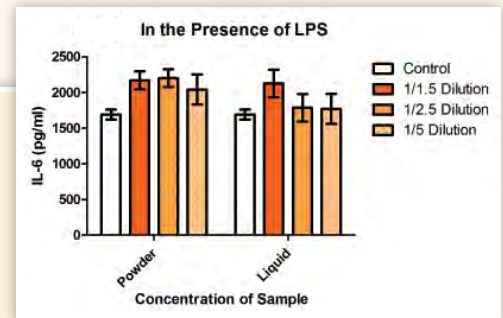
Taking healthy human cell lines, you then stimulate their differentiation/replication, and then administer the Beyond Tangy Tangerine® and Ultimate Classic® to examine two inflammatory responses, Leukotriene B4 (LTB4) and PGH2; these are indicators of an inflammatory response.

**Result:** When Beyond Tangy Tangerine® and Ultimate Classic® were administered to healthy human cell lines, they did not induce or create any inflammatory response in levels above and below the recommended dosage.

### STUDY TWO (IL-6 AND RAW 264.7 TEST-PROTECTION FROM INFLAMMATION):

IL-6 is an immune system modulator. It signals the body to respond and protect itself against inflammation. When there is a presence or heightened presence of IL-6, the body is thought to be in a protective and shielding response to inflammation. Beyond Tangy Tangerine® and Ultimate Classic® were administered and levels of IL-6 production was examined.

**Result:** Beyond Tangy Tangerine® induced and increased the levels of IL-6 when there was no inflammation in the body, heightening the body’s protective responses to possible inflammation. At various concentrations above and below the recommended dosage, Beyond Tangy Tangerine® induced a protective response by releasing levels of IL-6 in the body. The Beyond Tangy Tangerine® response was more significant than the Ultimate Classic® response.



### STUDY THREE

#### (IL-6 TEST-IMMUNE SYSTEM MODULATOR):

LPS is inflammation producing. In its presence, levels of IL-6 are elevated to alert the body of inflammation. IL-6 signals the body to send anti-inflammatory aids to support the increase in infection and injury. Beyond Tangy Tangerine® and Ultimate Classic® were administered to inflamed induced cells (cells given LPS) to examine whether the IL-6 response could be lessened because of the additional support of the two products.

**Result:** In the presence of inflammation, Beyond Tangy Tangerine® increased the levels of IL-6. Meaning that the cell line was able to increase its levels of the natural signaling immunomodulator to enhance the immune response by administering Beyond Tangy Tangerine®. Beyond Tangy Tangerine® was also able to decrease the levels of IL-6 in the presence of enhanced inflammation; it is important to note that too much inflammatory response (chronic inflammation) can be dangerous. Beyond Tangy Tangerine® was able to repress the IL-6 production of LPS; repressing the increased amount of inflammatory response also makes Beyond Tangy Tangerine® a potential immunomodulator.





# CANCER CELLS

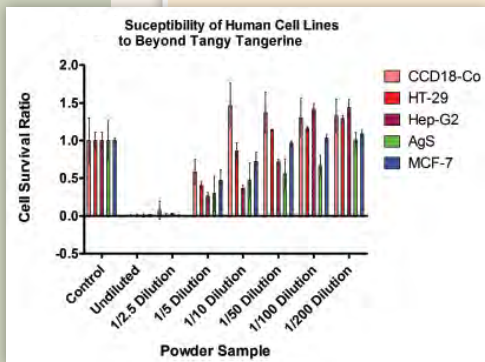
Cancer is categorized as a class of over 100 diseases. The diseases and conditions are so varied because the pathology of cancer begins with a single abnormal cell. The body is made up of trillions of living cells that grow, divide, and die in an orderly fashion. Deep within the cell, in its DNA, this process is tightly regulated. However, when cells become cancerous, the cells do not divide or behave in a healthy or orderly manner. Instead, unhealthy cells, the cells that are supposed to follow a natural programmed cell death, begin to multiply uncontrollably. These damaged cells with their improper functioning DNA, begin to breakdown and release components that can promote the spread of disease. The cell is the basic, fundamental unit of the body, its organs and systems. When the body becomes filled with cells that are not functioning properly, one can understand how this could be devastating and catastrophic to the body.

## HUMAN CANCER CELL LINE RESULTS

**Human Cells Lines:** Cancer is categorized by the area in which the abnormal growth and cells that contain damaged DNA are present. The true cause of cancer has not been found, and, through research, it seems to be a very complex and multi-perspective position. Therefore, evaluation of how to safely eradicate cancer cells has been the immediate focus; due to the current therapies that are not discriminatory and eliminate both healthy and unhealthy cells. Cell lines can be cultivated from any areas of the body susceptible to cancer. The following studies have taken cell lines from the colon, liver, stomach, and breast; each of these cells lines was cancerous. A normal colon cell line was also taken to be a control sample.

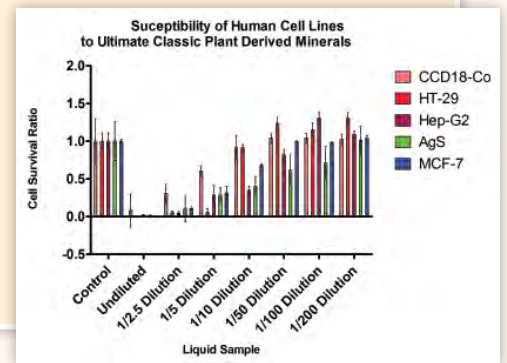
### STUDY ONE (CYTOTOXICITY ACTIVITY AGAINST CELL LINES):

Beyond Tangy Tangerine® and Ultimate Classic® were administered to the various cell lines, normal and cancerous, to assess the survival rates of the cells. First, both products were given to healthy colon cells to assess whether there was a significant amount of death of healthy cells. Next, both products were given to each unhealthy or cancerous cell lines of the colon, liver, stomach, and breast to assess whether there was a significant amount of death of each individual type of cancer cell.



**Results:** When Beyond Tangy Tangerine® and Ultimate Classic® were administered to healthy human colon cells, there was no significant death of healthy human cells compared to cancerous colon cells. When exposed to Ultimate Classic®, there was a 95% reduction in cancerous colon cells, 65% of cancerous liver and stomach cells, and 30% of cancerous breast cells. When exposed to Beyond Tangy Tangerine®, there was a 60% reduction of cancerous colon cells, 65% of cancerous liver and stomach cells, and 30% of cancerous breast cells. Both products were administered at levels

above and below the recommended levels, the percentages above directly relate to the recommended dosage of both products.



### STUDY TWO (MTS CELL PROLIFERATION ASSAY):

All the cancerous cell cultures were washed with saline and given fresh media or growing environment after being subjected to both products; Beyond Tangy Tangerine® and Ultimate Classic®. Each cell line was evaluated at 24 hours post-treatment to see if there was any proliferation of cancerous cells. Survival rates of treated cells were compared to that of the untreated cells.

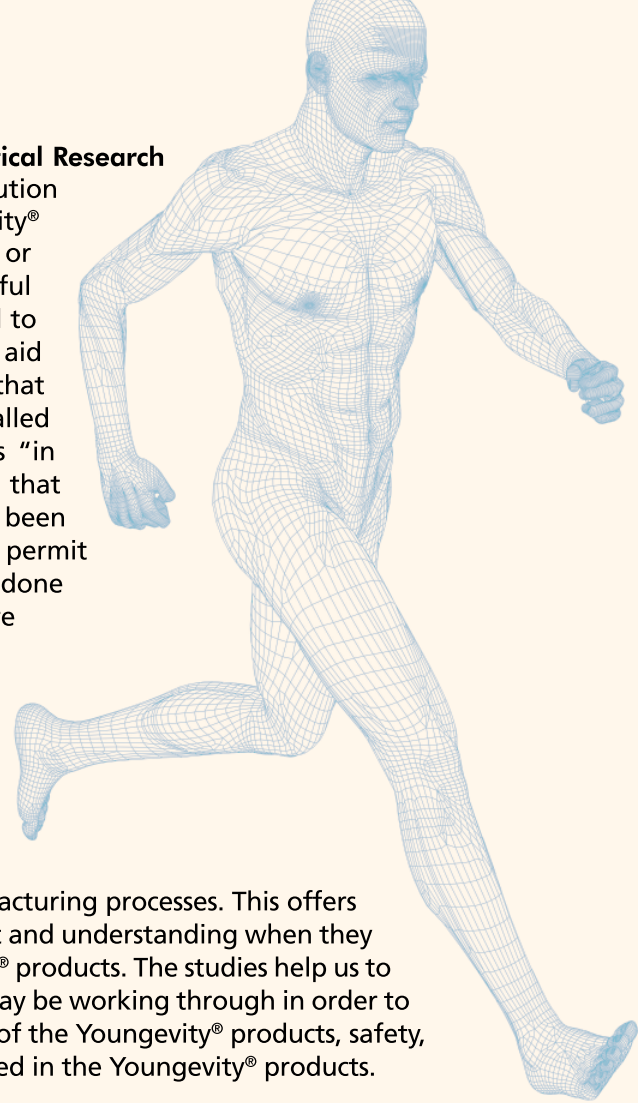
**Result:** Beyond Tangy Tangerine® and Ultimate Classic® both exhibited efficient inhibition on proliferation of cancerous cells at the recommended dosage levels. The assays, or evaluations, were carried out multiple times, sextuplicates (n=6), to confirm the results. Both products showed there was inhibition of the growth of more cancerous cells, preventing further malignant multiplication and growth of unhealthy cells.



## UNDERSTANDING THE HUMAN BODY

### Youngevity® and Clemson University – Institute of Nutraceutical Research

are excited about the recent findings, but we also caution individuals not to overextend the findings to feel the Youngevity® products are able to prevent, treat, or cure any type of disease or illness. The Youngevity® products, although incredibly powerful and health giving, are dietary supplements that are designed to work with nutrition, exercise, and a positive mental state to aid in the support of overall health and wellness. The studies that were undertaken were NOT human clinical trials, but are called “bench” or “test tube” studies. The most scientific name is “in vitro”. In vitro is defined as, studies in experimental biology that are conducted using components of an organism that have been isolated from their usual biological surroundings in order to permit a more detailed or more convenient analysis than can be done with whole organisms. These are limited clinical studies; more research is needed. Youngevity® has committed to enhancing their studies by designing even better models that closely resemble the environments of the body.



## WHAT THIS MEANS FOR YOU

The Clemson University studies have validated Youngevity's confidence in our products, scientists, formulators, and manufacturing processes. This offers our valued customers and distributors another layer of support and understanding when they hear the variety of testimonials and benefits of the Youngevity® products. The studies help us to understand some of the pathways the Youngevity® products may be working through in order to provide these benefits. They also remind us that the very root of the Youngevity® products, safety, can be assured and that no level of hazard will ever be tolerated in the Youngevity® products.

## AUTHORIZED FDA HEALTH CLAIMS:

Selenium may reduce the risk of certain cancers. Some scientific evidence suggests that consumption of Selenium may reduce the risk of certain forms of cancer. However, the FDA has determined that this evidence is limited and not conclusive.

Selenium may create an anti-carcinogenic effect in the body. Some scientific evidence suggests that consumption of Selenium may produce anti-carcinogenic effects in the body. However, the FDA has determined that this evidence is limited and not conclusive.

THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION.  
THESE PRODUCTS ARE NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.

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