

GROWING YOUNGER

*How to quickly reverse your
biological markers of aging*



TODD OVOKAITYS, M.D.

The story of landmark discoveries in the
quest for living younger and longer

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Todd Ovokaitys, MD

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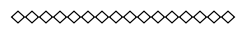
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CHAPTER 1



THE QUEST FOR EXTENDED LIFE

Since the time man first became self-aware, a central inquiry has persisted: Can we live longer? Can we live better? Can we perhaps live forever? These questions have lingered and fascinated us almost as profoundly as the meaning of life itself.

For millennia, there have been myths of alchemists' magical elixirs or of enchanted waters that might confer extended life. These myths have helped create in our group psyche the belief— or at least the hope— that we can overcome the apparent limitations of our biology.

We have proven that we can live longer. Survival data shows that life expectancy has been progressively increasing over the past several centuries. But the question remains: just how far can we push the envelope?

Bold answers to this question emerge not from philosophy, but from science. In his popular book “Ending Aging” Cambridge scientist Aubrey de Grey, Ph.D., states his ambitious goal: the end of aging itself¹. His program focuses on engineering solutions to reversing biological insults of aging, the results of which are intended to be greatly extended life spans and, potentially, eternal youth itself. His book carries the compelling back cover statement that “People alive today could live to be a thousand years old!”

1 De Grey A and Rae M. Ending Aging: The Rejuvenation Breakthroughs That Could Reverse Human Aging in Our Lifetime. New York. St. Martin's Press, 2007.

A core concept circulating in books about our potential for longevity is the exponential rate of new knowledge being created. As new discoveries occur in many fields of inquiry, vast arrays of new connections can be formed. Each new finding can often make a much broader contribution than initially thought by delivering applications in areas beyond that of the original discovery. In “Fantastic Voyage: Live Long Enough to Live Forever”, Ray Kurzweil and Terry Grossman, MD, model this rate of change into an astonishing projection:

The technological progress of the 21st century will be 1000 times greater than that of the entire 20th century!²

The projected timeline of anti-aging advances is surprisingly brief. Aubrey de Grey has created an organization to accelerate this work called SENS – Strategies for Engineered Negligible Senescence. He asserts that we will successfully stop aging in mice within 10 years. With this knowledge, therapies to halt and reverse human aging could follow within 5-10 years after that.

They then offer Dr. de Grey’s boldest prediction:

“Life expectancy will be in the region of 5000 years...by the year 2100.”

“Fantastic Voyage” declares that if you can live for 5 more years, the technology is expected to allow you to live 30 more years. And if you can stay alive another 30 years, the technology for limitless youthful life may be available.

The logic of this statement thus reduces to this:

If you can make it another 5 years, you can potentially live as long as you choose.

The priority then becomes: How healthy and youthful can you make yourself in the next 5 years? The healthier and more vital you make your cells and tissues now, the better you will be prepared to enjoy the fruits of the new discoveries.

That then takes us to the journey of this book. As a young doctor and research scientist, I became fascinated by the work of a particular researcher that seemed to have enormous potential to control our DNA aging clock. This led— after intensive study and personal research— to the eventual development of nutritional and lifestyle protocols in the pages that follow.

² Kurzweil R and Grossman T *Fantastic Voyage: Live Long Enough to Live Forever*. New York. Plume, A Member of Penguin Group, 2005.

You are now invited to take a walk into the inner workings of your cells. This is truly a fantastic voyage. To see and understand the mechanisms of the clock will give you tools to rewind the clock— in other words, to turn back the hands of time. We go now to an obscure lab and an incredible result shrouded in mystery. From here the journey of discovery will unfold...

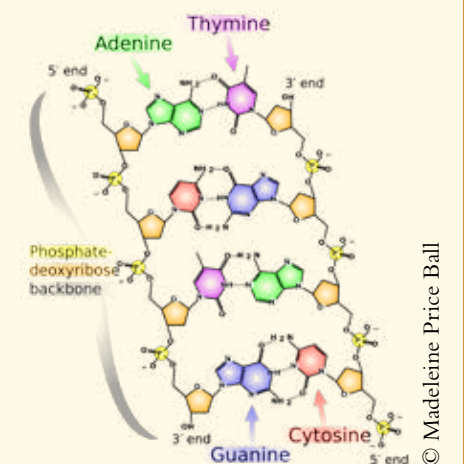
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de Grey A and Rae M. Ending Aging: The Rejuvenation Breakthroughs That Could Reverse Human Aging in Our Lifetime. New York. St. Martin’s Press, 2007.

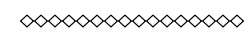
Kurzweil R and Grossman T Fantastic Voyage: Live Long Enough to Live Forever. New York. Plume, A Member of Penguin Group, 2005.

A NOTE ABOUT DNA AND RNA TERMINOLOGY

DNA and RNA are known in chemical terms as nucleic acids. They range from small molecule building blocks to massive molecules formed of these building blocks that are strung together in specific sequences. Without going into the complex technical details, these building blocks from smaller to larger are called nucleic acid bases, nucleosides, and nucleotides. The term nucleic acids refers to any of these species, from the smallest bases to gigantic DNA molecules that can have tens of millions of bases linked together in a string. For ease of following along, the term nucleic acids will often be used to refer to this entire class of molecules.



CHAPTER 2



AN ASTONISHING ENHANCEMENT OF MAMMALIAN LIFE SPAN

We now go back more than fifty years to an obscure lab in London to visit a remarkable experiment. Published in 1973 by Dr. Max Odens³, it describes a pilot study that blows the doors off the current best marks for longevity of a mammal.

The reported usual life span of the chosen strain of laboratory animals (rats were used in these tests) was 800–900 days. As biological aging mechanisms are similar for all mammals, a method that increases longevity in rats or mice will potentially increase life span in people too. Ten animals were used in the study, a relatively small population, but enough to screen for an effect if very significant.

The animals were all 750 days old at the start of the study, nearly at the end of their usual life span. Thus it would take relatively little time to see if a life-extending result were occurring. Five animals were placed in control Group A and five in treatment Group B. All animals received the same food and conditions of care, with the exception of the therapeutic intervention being given only to the treatment group: a once-a-week injection of a solution of DNA and RNA. Daily temperature and weight were measured for all the animals.

By the twelfth week of injections the author reported that the control Group A rats “looked old, moved slowly, did not eat much, and lost weight.” In sharp contrast, the control Group B rats “looked younger, were very lively, and had gained weight.” The author’s comment was clear and to the point:

3 Odens M, Prolongation of the life span in rats. *Journal of the American Geriatrics Society*. 1973; 21(10): 450–451.

“The difference was remarkable.”

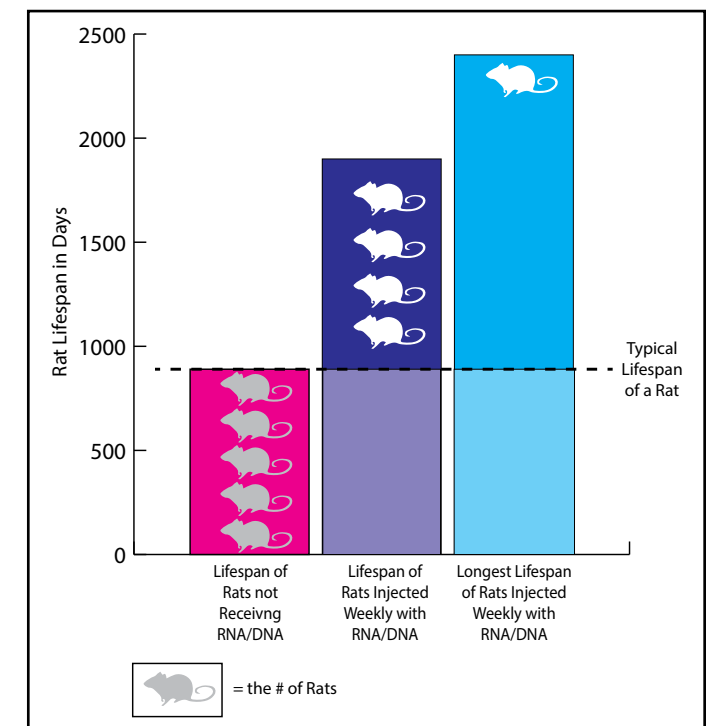
As expected, “all the untreated rats died before 900 days.” This meant that all the control animals showed only normal life spans, and all survived less than 150 days into the study. By contrast, the minimum additional life span in the treated animals was an astonishing 850 days, essentially doubling the usual longevity. The longest lived animal survived 1500 additional days, coming close to tripling the life span. 80 percent of the treated animals survived to between days 1600 and 1900. The longest lived animal made it all the way to 2250 days! Although this study was small, the results were extraordinary for showing the effect of stretching the natural life span.

Upon reading this study I considered the profound implications if this treatment worked not only for rodents but for people. Given that the study started with older animals, it is perhaps particularly remarkable that the remaining life span was increased by a factor several times that of the untreated animals. A roughly 500–900 percent increase in remaining life span is nothing short of spectacular.

Because of my deep interest in this research I had the same question as many others pursuing life extension protocols. What was the exact dosage of the DNA and RNA in a milligram per kilogram ratio? If we knew this, the study could be repeated to confirm or disprove the observations. That information would have allowed an estimate of the dosages that would create a comparable administration level for people. While it would be a near absolute requirement in a peer reviewed journal published today, that information was frustratingly absent from the Materials and Methods section of the paper.

I looked far and wide to find the dosage of the DNA and RNA used in the study. While this data may exist somewhere, it has yet to be revealed.

Though the test group was small, the longevity increase of these animals — all minimally doubling and one nearly tripling its expected life span — surely warranted further investigation. Given the lack of reported replication of the Odens work — despite its provocative and promising nature — I began seeking related evidence to test its implications. If DNA and RNA had been delivered to mammals in other contexts, I hoped such research would indicate whether there were objective



Extending Mammalian Lifespan with RNA/DNA

More recent research, however, has identified that under stress, or due to the aging process itself, the body does not make enough DNA and RNA to support optimum tissue repair and health.

According to Dr. Frederick B. Rudolph, a leading nucleic acid researcher from Rice University, there are multiple roles for dietary DNA and RNA. “These include the maintenance of a competent immune system, gut development, hepatic function, and many others.”⁴ Dr. Rudolph continues: “Rapidly dividing cells require these compounds for optimal function. These compounds were previously thought to be non-essential but are now considered to be conditionally required when various stresses, including rapid growth and infection, are present.” Thus, a leading researcher asserts that DNA and RNA intake is essential under a variety of stresses, a deficiency of which could negatively impact survival and longevity.

Numerous published scientific studies support the use of supplemental nucleic acids. Let’s summarize the highlights of this research.

Research Studies with Supplemental DNA and RNA Components

Almost every system of the body has been shown to have improved vitality or functionality with the use of these compounds from infancy to advanced age. Scenarios and systems for which research shows benefit include the following:

Infections

Staphylococcus aureus is one of the most aggressive bacterial infections faced in medical treatment. It tends to cause deep-seated abscess forming infections, often associated with extensive tissue destruction, high fever, and resistance to treatment. Surgical drainage is often required to clear pockets of infection. Without surgery, antibiotics alone are often ineffective at eradicating this invasive pathogen. Epidemics of methicillin-resistant Staphylococcus aureus (MRSA) have become a devastating problem in hospitals and treatment centers around the world.

A study was performed to assess the ability of supplemental nucleic acids to modify the course of

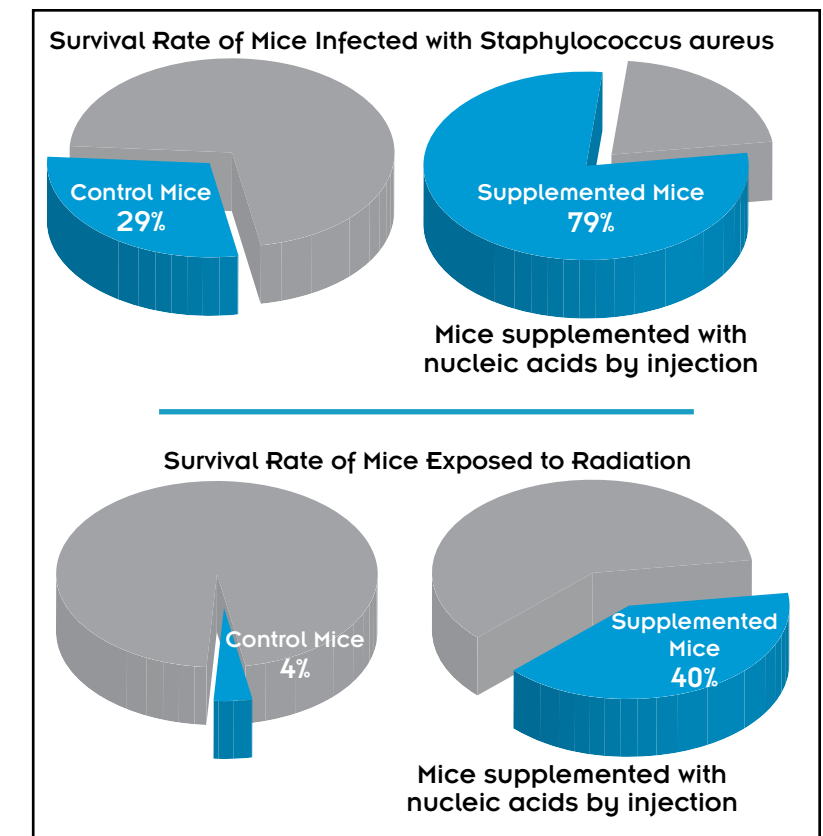
virulent Staph aureus infection⁵. The control mice not getting the nucleic acids had only a 29 percent survival rate. In contrast, the animals that were supplemented with nucleic acids by injection had a survival rate nearly triple that of control mice at 79 percent.

Radiation Injury

Ionizing radiation sends cannonballs of high energy particles through tissue, ripping apart DNA proteins and cell membranes. The greater the intensity and dose, the greater the harm that occurs to all exposed tissues. The greatest harm tends to occur to cells that are dividing the most rapidly—including blood forming cells, immune cells and intestinal lining cells. In a lab study, animals exposed to high dose radiation showed a survival rate of only 4 percent⁶. Those that in addition received injected nucleic acids showed a survival rate of 40 percent—a remarkable 900 percent improvement!

Tumors

A study assessed whether RNA supplementation improved survival from an aggressive cancer⁷. The test mice received a tumor vaccine and then transplants of a tumor cell line. The animals that received only the tumor vaccine all died within three weeks. In sharp contrast, the animals that received every other day injections of RNA after the tumor vaccine had a 40 percent long-term survival. The result of RNA supplementation was statistically significant and almost doubled the lifespan compared to that of control mice. In this model, the anti-tumor vaccine was effective in improving survival and outcome only when nucleic acids were supplemented.



5 Adjei AA, Takamine F, Yokoyama H, et al. The effects of oral RNA and intraperitoneal nucleoside-nucleotide administration on methicillin-resistant Staphylococcus aureus infection in mice. Journal of Parenteral and Enteral Nutrition. 1993; 17:148-152.

6 Tikhomirova MV, Iashkin PN, Fedorenko BS, et al. Radiation protective effectiveness of ATP and adenosine against high energy protons. Kosm Biol Aviakosm Med. 1984; 18 (5): 75-77.

7 Rigby PG. The effect of “exogenous” RNA on the improvement of syngeneic tumor immunity. Cancer Research. 1971; 31: 4-6.

4 Rudolph FB and Van Buren CT. The metabolic effects of enterally administered nucleic acids. Current Opinion in Clinical Nutrition and Metabolic Care. 1998; 1: 527-530.

Tissue Regeneration

To sustain health, virtually every tissue in the body must replace its cells regularly. It is now known that even neurons in the brain have regenerative capacity. Any tissue, to rebuild itself, requires the ability to make DNA and RNA to support the process of making new cells.

A study in rats observed the results after removal of 70 percent of the liver, depending on whether nucleic acids were given⁸. The animals receiving the injections showed a significantly greater rate of tissue regeneration, including greater whole body new protein generation, than the control animals not supplemented. The data showed that repair and growth of organs and tissues can be improved by providing an external source of preformed nucleic acids.

Wound Healing

A wound, surgical or otherwise, results in severing the usual integrity of tissue organization. When tissue regenerates, cells migrate into the area of the wound to repair the damage. But the nature of the repair can differ— the migrating cells may regenerate new tissue or they may fill the defect with scar tissue. The type of healing depends on the tissue— the liver will tend to restore normal liver cells in the wound, whereas the skin will tend to fill the breach with scar to restore strength.

Several studies in wound healing have assessed the effects of supplemental RNA, especially on surgical wounds. Compared to the control group, those receiving the supplemental RNA (along with arginine and fish oil) had a reduction in postoperative infections and wound complications (42 percent versus 10 percent), which resulted in a significantly reduced length of hospital stay⁹.

Glandular Health

The body has two basic types of glands. The exocrine glands are those that secrete into a surface or a lining like the salivary glands that make saliva. The endocrine glands are those that secrete their products, usually potent hormones, directly into the blood. Studies have shown that several of the most powerful endocrine glands in the body often depend on dietary nucleic acid intake for optimum function. Vitaly important glands for which this has been shown include the following:

- Pituitary gland— the “master gland” that makes hormones that control 7 other glands or bodily systems.
- Thyroid gland— the maker of thyroid hormone that sets the metabolism and energy production in the body.
- Thymus gland— the gland of “rejuvenation and immunity” residing just behind the breast

8 Ogoshi S, Iwasa M, Tamiya T. Effect of nucleotide and nucleoside mixture on rats given total parental nutrition after 70 percent hepatectomy. *Journal of Parenteral and Enteral Nutrition*. 1985; 9: 339-342.

9 Bower R, Cerra F, Bershasley B, et al. Early enteral administration of a formula (Impact) supplemented with arginine, nucleotides and fish oil in intensive care unit patients: results of a multicenter prospective, randomized clinical trial. *Critical Care Medicine*. 1995; 23: 436.

bone in the upper chest. This tissue produces the cells that coordinate many key functions of the immune system. The cells produced are called T cell lymphocytes because they are thymus derived.

- Adrenal glands— the makers of adrenaline, the “fight or flight” hormone, that sit atop the kidneys. Many chronically stressed persons have burned out adrenal glands and desperately need a program to bring these glands— and them— back to life!

When nucleic acids were given in an intravenous infusion, the endocrine glands described above were found to extract very high ratios of these components compared to tissues with less dynamic nucleic acid turnover¹⁰. This was taken to mean that these glands thrive if DNA and RNA building blocks are supplemented, and may have less than optimal function if not.

Bowel Health

While it is often overlooked, there are doctors who believe that “life begins in the colon.” If the bowels are kept well and happy, digestion is good, nutrition is good, and life tends to be good.

Amazingly, the lining of the colon and intestines is only one cell layer thick.

Given the large quantities of acid and food and all manner of stuff going through it, a single thin layer of cells manages all the processes of digestion, absorption, and elimination. What a workload!

To complicate matters, the intestinal lining cells last for almost the blink of an eye. **Every week the entire lining is replaced with new cells.** This means that an astounding amount of cell replication must occur to keep up with this process. Tissues that turn over so rapidly need a large amount of nucleic acids, and the needs of the intestinal lining are among the most acute. A little bit of DNA and RNA goes a long way to bettering the health of the gut.

One study that showed this principle was done with young rats¹¹. These animals had chronic diarrhea and were found to have a deteriorated intestinal lining that made almost no digestive enzymes. They looked sickly and near death when they were fed supplemental nucleic acids. The results: their lining cells sprang back like wilted flowers being given water. Their enzymes returned, they could ingest and digest again, and they thrived.

10 Savaiano DA, Ho CY, Chu V, et al. Metabolism of orally and intravenously administered purines in rats. *Journal of Nutrition*. 1980; 110: 1793-1804.

11 Nunez MC, Ayudarte MV, Morales D, et al. Effect of dietary nucleotides on intestinal repair in rats with experimental chronic diarrhea. *Journal of Parenteral and Enteral Nutrition*. 1990; 14: 598-604.

Nucleic acid ingestion is especially important for human babies. Breast milk has a much higher content of DNA and RNA elements than formula milk. In developing countries, babies fed formula milk have been found to have bad bacteria rather than healthy bacteria in their intestines. This shift to bad bacteria has been associated with infant diarrhea, which can be fatal. What happens when infants on formula milk have nucleic acids added in good proportions¹²?

1. The intestinal bacteria change to the healthy bacterial pattern of breast fed infants.
2. The incidence and severity of outbreaks of life threatening diarrhea are greatly reduced.
3. Very interestingly, blood lipid profiles improve, especially with an increase of the so-called good HDL cholesterol that transports cholesterol away from blood vessels and protects against cardiovascular disease.

Growth and Development

Studies in young laboratory animals have observed the effects of supplementing nucleic acids. Compared to control animals, nucleic acid enhanced diets increased the rate and quality of intestinal growth and maturation¹³. Production of tissue proteins was also higher in the treated animals. The lining of the intestines showed a more developed absorptive surface with greater enzyme content in the supplemented compared to control animals. These studies support the view that tissues that are rapidly developing or turning over do much better if given sufficient nucleic acids.

Cellular Immunity

The glue that holds the immune system in place is called cellular immunity. Numerous published studies show very significant strengthening of the cellular immune system with supplementing nucleic acids¹⁴. Cells that are quickly expanding their population can do so more effectively if DNA and RNA are present to support their replication¹⁵. This is particularly important for increasing the number and activity of helper T cells (the beneficial cells responsible for clearing the body of abnormal cells that harbor viruses or are precursors of malignancy).

Memory Enhancement

While certain nutrients are well known for their effects to support memory, the importance of nucleic acids is not widely recognized. Forming long term memory requires new protein synthesis,

which in turn requires nucleic acids in adequate supply. Studies in animals¹⁶ and people¹⁷ have shown a marked improvement of memory upon effective delivery of nucleic acids for this purpose.

Summary and Conclusion

DNA and RNA building blocks provide critical functions to every cell of the body. DNA contains the code of life and provides the

instruction sets to build the structural and functional proteins upon which life is based. RNA is used to both transcribe and translate the code into proteins when and as needed. Both are required in optimum amounts to support both cellular regeneration and cellular function.

DNA and RNA intake has not been considered essential because the body can make them from other nutrients in the diet. However, research now confirms that under stress or due to aging itself, production may not be sufficient for the highest possible cellular vitality.

Numerous lines of evidence indicate that supplementing DNA and RNA building blocks can strengthen the structure and function of bodily tissues. This benefit holds for many types of cells and systems, as the above examples illustrate— either for the prevention of a deficiency state, or to provide the cells what they need for optimum levels of function. From head to toe, inside and out, providing nucleic acids offers cells the support to function at peak performance— and a powerful edge in the quest for rejuvenation.



12 Uauy R, Quan R and Gil A. Role of nucleotides in intestinal development and repair: implication for infant nutrition. American Institute of Nutrition. 1994; 124: 1436S-1441S.

13 Uauy R, Stringel G, Thomas R, et al. Effect of dietary nucleosides on growth and maturation of the developing gut in the rat. Journal of Pediatric Gastroenterology and Nutrition. 1990; 10: 497-503.

14 Kulkarni AD, Rudolph FB, Van Buren CT. The role of dietary sources of nucleotides in immune function: a review. Journal of Nutrition. 1990; 124: 1442S.

15 Van Buren CT and Rudolph FB. Dietary nucleotides: a conditional requirement. Nutrition. 1997; 13(5): 470-472.

16 Cook LA, Davidson AB, Davis DJ, et al. Ribonucleic acid: effect on conditioned behavior in rats. Science. 1963; 141: 268-269.

17 Cameron DE, Kral VA, Solyom L, et al. In Gaito J (Editor), Macromolecules and Behavior. New York. Appleton-Century Crofts, 1966: 129-148.

1. Purified DNA and RNA Nucleic Acids
2. DNA and RNA-Building Amino Acids
3. DNA Methyl Group Transfer Factors
4. Adenosine Triphosphate (ATP)
5. Liquid Delivery System
6. Patented Qi Laser Molecular Activation Technology

Component 1: Purified DNA and RNA Nucleic Acids

Purpose: To deliver the bases of DNA and RNA in their simplest and most readily used forms.

Nucleic acids are provided in their individual building block forms rather than as strings of building blocks together. Because only individual bases are used, there is no sequence information—in other words, there is no risk that any DNA code information can be transferred. As single bases, these nutrients are purely building blocks to fashion into the larger DNA and RNA molecules that the body needs for its health and function. And by reducing the molecular form to the smallest size possible, the absorption and usability of these elements are strongly enhanced.

As to safety guidelines for their use, international standards for safe levels for infant formula were used. At levels adjusted for body size, the formula ingredients are at safe levels even for infants.

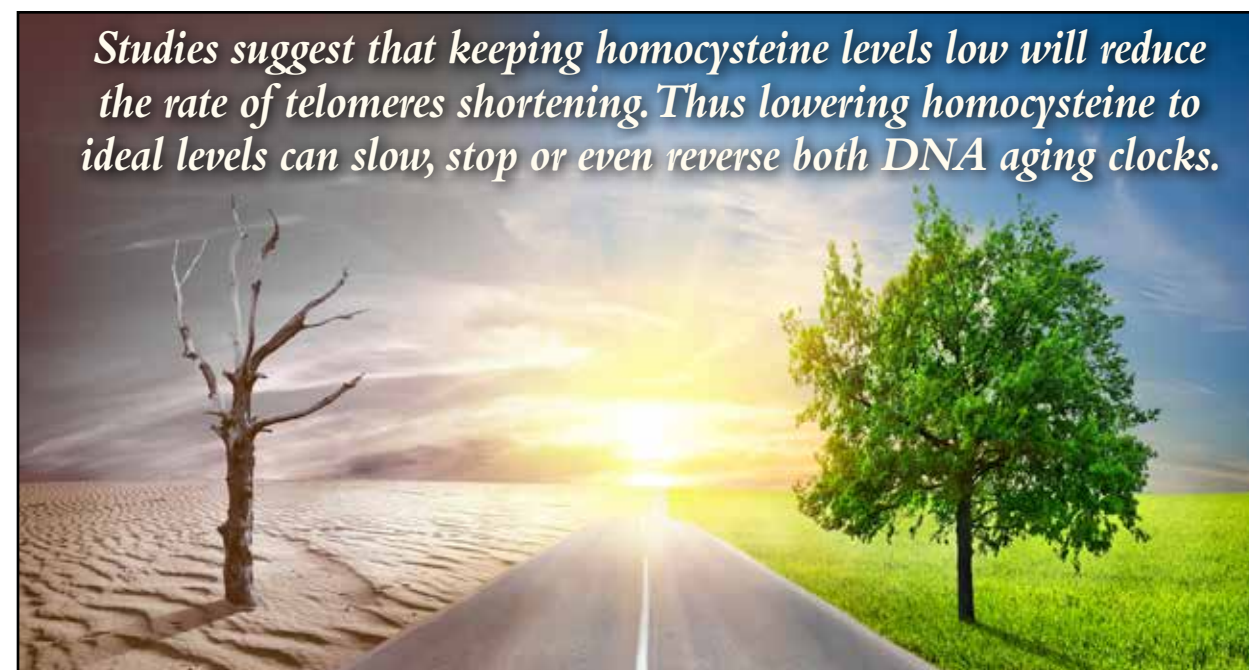
Component 2: DNA and RNA-Building Amino Acids

Purpose: To provide the cells with the basic ingredients to create the body's own DNA and RNA bases.

Along with DNA and RNA, amino acids are a core building block system for life chemistry. There are 20 amino acids that are used to construct the numerous types of proteins in the body. Such proteins include structural proteins like collagen that form the framework of tissues, or muscle proteins that provide the matrix for muscular action. There are also functional proteins such as enzymes; these are catalysts that allow the body to build up or break down molecules as needed.

Amino acids can also serve to provide the pieces for making other types of more complex chemistry. DNA and RNA bases can be made from selected amino acids and other small molecules¹⁹. Providing these amino acids gives the cells the basic ingredients for the body to make its own DNA and RNA bases from scratch when and where needed. MethusaLife™ contains the specific amino acids the body requires for this purpose.

¹⁹ Grimble GK. Dietary nucleotides and gut mucosal defense. Gut. 1994; supplement 1: S46-S51.



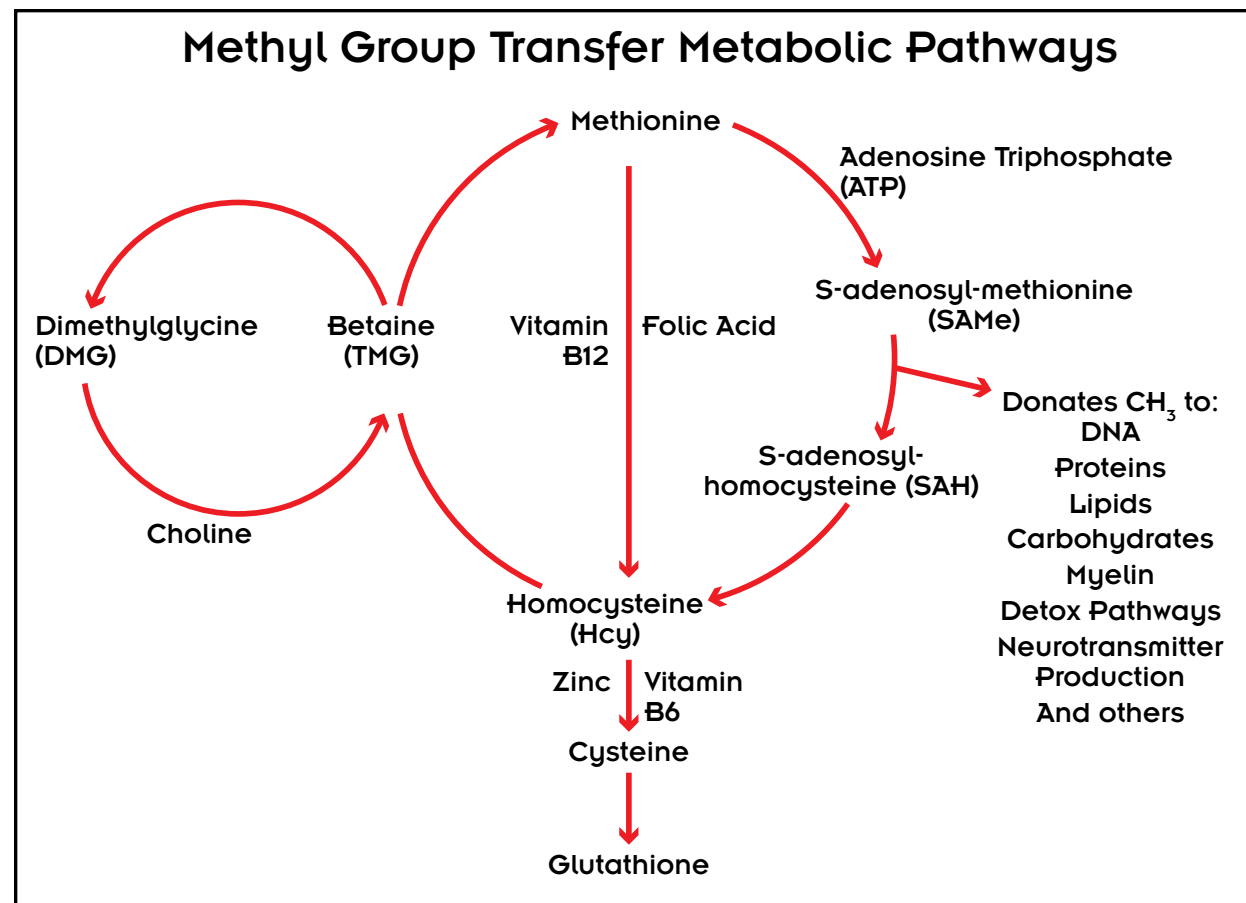
Component 3: DNA Methyl Group Transfer Factors

Purpose: To provide the necessary nutrients for anti-aging effects in DNA as our storehouse of nucleic acids is being regenerated.

For those interested in turning back the biological clock, it's useful to know the nature of the clock. Our DNA has two types of clocks that give a measure for biological age—clocks that are separate yet related. The first of these is the length of what are called telomeres. This term comes from the roots “telos” meaning “the end of” and “meres” meaning “relating to the chromosomes.”

Telomeres, then, are the ends of the chromosomes. They have been likened to the plastic that keeps shoelaces from unraveling with use. When the plastic falls off, the laces unravel and no longer function properly. Similarly, as cells divide the telomeres tend to get shorter, and when too short, the cells stop dividing. When the telomeres shorten by about 50 percent from their length at birth, DNA division becomes unstable and such cells no longer regenerate. There is much enthusiasm and research for methods that may lengthen the telomeres and turn back the aging clock of DNA. This could literally make the cells younger again.

Distinct from telomere length yet related is a process called DNA methylation. A methyl group is the simplest combination of carbon and hydrogen used in the body—consisting of one carbon atom bonded to three hydrogen atoms.



Methyl groups are extremely important in human biological chemistry²⁰. They are a building block of organic compounds, adding carbon atoms one at a time to make larger molecules.

With respect to DNA, at the time of birth each type of cell has methyl groups attached to specific DNA bases. The pattern is unique to each type of the over 200 types of cells that make up the body. The DNA methylation pattern instructs each type of cell which proteins it is not supposed to make. This set of precisely placed methyl groups is critically important to differentiate all the types of cells from one another. This is how kidney cells are instructed only to make kidney proteins and brain cells to make brain proteins, and so forth.

The gradual loss of methyl groups from DNA over time is considered to be the second biological clock. When 40 percent of the methyl groups have fallen off their DNA placement from the time of birth, degenerative death tends to occur.

All of the factors known to cause aging— including smoking, poor nutrition, poor vitamin

20 Cooney C and Lawren B. *Methyl Magic: Maximum Health through Methylation*. Kansas City: Andrews McMeel Publishing, 1999.

intake, lack of exercise, and environmental toxin and radiation exposure— accelerate the loss of these methyl groups from DNA²¹. Any intervention that slows, stops and reverses the loss of well placed methyl groups from DNA is slowing, stopping and reversing aging at the DNA level.

A key indicator of the status of this system is homocysteine. This is a by-product of metabolism which is normally present in the body. At low levels it is beneficial, but it can accumulate to unhealthy high levels if proper methylation is not taking place.

At a level of 7 or below, cardiovascular risks are at or below the level of the general population. A seemingly small rise to 10 already doubles the cardiovascular risks. At 20, the risks are over 9 times that of the general population²².

The level of homocysteine indicates the state of health or balance of the pathways that methylate and protect DNA (and the brain and blood vessels). A one point lowering of homocysteine can translate to an approximately 8-10 percent reduction of cardiovascular risks and correlates with reversing aging chemistry markers by about 3-5 years. Therefore it is ideal to lower and maintain the homocysteine level to 7 or lower.

To return our focus for a moment to telomere length:

Studies suggest that keeping homocysteine levels low will reduce the rate of telomeres shortening. Thus lowering homocysteine to ideal levels can slow, stop or even reverse both DNA aging clocks.

There are 3 major pathways through which homocysteine levels are lowered— and MethusaLife™ activates all three. The first of these pathways converts homocysteine to the sulfur amino acid cysteine²³ using vitamin B6. The cysteine can then be used to generate a highly beneficial antioxidant molecule known as glutathione. This is the most prevalent and perhaps most important antioxidant within the cells. Glutathione protects DNA, proteins, and cell membranes and is celebrated as a powerful anti-aging, anti-tumor, antioxidant.

The second avenue of reducing homocysteine is a well-recognized pathway that uses vitamin B12 and folic acid. This process converts homocysteine to the sulfur containing amino acid called methionine. This amino acid supports healthy hair, skin, and nails, and along with cysteine and glutathione binds to and clears toxic heavy metals like mercury from the body.

21 Nygard O, Vollset SE, Refsum H, et al. Total plasma homocysteine and cardiovascular risk profile (the Hordaland Homocysteine Study). *Journal of the American Medical Assoc.* 1995; 274 (19): 1526-1533.

22 Verhoef P, Stampfer MJ, Buring JE, et al. Homocysteine metabolism and risk of myocardial infarction: relation with vitamins B6, B12, and folate. *American Journal of Epidemiology.* 1996; 143 (9): 845-859.

23 McKully KS. *The Homocysteine Revolution: Medicine for the Next Millennium*. Los Angeles: Keats Publishing, 1999.

The third pathway for lowering homocysteine is the least known, yet perhaps the most vital for bodily health. In the liver and kidneys there is a special enzyme called betaine-homocysteine methyltransferase. This enzyme transfers a methyl group from betaine to homocysteine to convert it to methionine. This leads to a critically important next step, which is the combination of methionine with the energy molecule adenosine triphosphate (ATP.) When combined in this sequence, particularly in the liver, this produces the profoundly important compound S-adenosyl-methionine, popularly known as SAME. Animal studies have shown that administering betaine (also called trimethylglycine, or TMG) can increase the production of SAME in the liver by as much as 6-fold.

Homocysteine Level <small>*Micromoles per liter of blood</small>	Cardiac Risk Increase*
<6.3	<1x increased risk
6.3	1x increased risk
10	2x increased risk
15	4x increased risk
20	9x increased risk

To put methyl groups back on DNA and thus slow, stop and even reverse the DNA aging clock requires a methyl group donor. The only methyl group donor in the body that restores methyl groups to DNA is SAME. Not only does SAME provide methyl groups for this purpose, it participates in over a hundred additional beneficial pathways. These include clearing toxins and rebuilding the healthy structure and function of cells. Just a few of the salutary actions of SAME include²⁴:

- *Repairing cellular proteins – through a special enzyme system (called protein isoaspartyl methyltransferase, or PIMT) - degenerating proteins can be rejuvenated.*
- *Cell membrane repair – helps restore or sustain healthy fluidity and function of cell membranes, essential for cellular regeneration.*
- *Producing myelin – the protective insulating covering of larger nerves that allows nerve impulse to be rapidly relayed.*
- *Detoxification – assists in clearing insecticides, pesticides, and organic toxins from food, air, water and other exposures.*

- *Neurotransmitter production – enhances the production of serotonin— the natural brain chemical that elevates mood. It also assists in producing norepinephrine and epinephrine, brain and body adrenaline respectively, which are important for mental energy, clarity and focus.*

The MethusaLife™ Formula thus provides the most powerful nutrient factors for increasing SAME and improving DNA methylation — while reducing toxic homocysteine.

Component 4: Adenosine Triphosphate (ATP)

Purpose: To provide the energy to build nucleic acids in the body.

The processes of life itself are driven by adenosine triphosphate, or ATP. This molecule does double duty— as a building block of nucleic acids in the body and as the core currency of energy for all bodily systems. When you ingest glucose or fat in the diet, the body extracts the energy from them and stores it in the high energy phosphate bonds of ATP. Virtually all processes in the body needing energy, whether electrical activity in the brain, the beating of the heart, the contraction of muscles, or conducting thousands of other chemical reactions, are driven by the energy liberated from the phosphate groups of ATP.

Thus, in MethusaLife™, the ATP is doing more than delivering the material to build the nucleic acids; it is also providing the energy to do so. As a core driver of living functions, the study of ATP has shown many additional benefits from its use or supplementation. (For more on ATP, please see the Appendix)

Component 5: Liquid Delivery System

Purpose: To provide for the greatest absorption and assimilation within the body.

Developing MethusaLife™ as an oral spray was crucial, because dry nucleic acid delivery achieves an amazingly low 1-3 percent absorption in the body. Pressed tablets in some cases may never even dissolve, and have been seen in some cases to exit the GI tract as still intact tablets. In contrast, well formulated oral delivery systems with suitable forms and sizes of molecules, may achieve 80-90 percent or greater absorption.

**Component 6:
Patented Quantum Molecular Enhancement Technology**

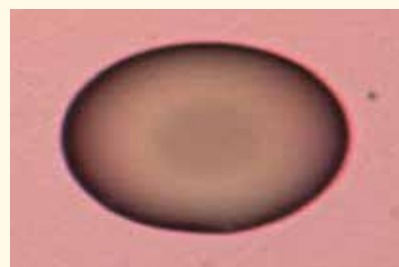
Purpose: To reshape the nutrients in order to maximize the effectiveness of the formula.

One of the most remarkable features of MethusaLife™ is the use of an advanced molecular resonance platform— a unique way to make the nutrients easier to absorb and use in the human body.

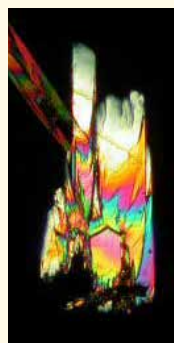
The quantum information laser, or Qi laser, is an innovation from our lab, over a decade

24 Frankl P. The Methylation Miracle: Unleash Your Body's Natural Source of SAME. St. Martin's Mass Market Paper, 1999.

**NONCRYSTALLINE
HIGH ENERGY
GLASS ASPIRIN**



With the Qi laser system, it has been possible to create the world's first new solid state form of aspirin. Despite over 100 years of research since the time of its first patent in the year 1900, this is the only new form ever produced that is stable at room temperature. The state our lab has produced and patented is called a glass form. With its much higher free energy, this new glass form will dissolve and absorb faster than ordinary crystalline aspirin. Part of the reason that typical aspirin can cause bleeding is that the crystals are mechanically sharp and act like microscopic razor blades to make small cuts on the surface of the stomach or small intestine. The new high energy form is free of these sharp edges.



in development. The laser beam passes through a patented optical device that converts the beam into a pattern of extremely fast pulses.

Molecules can vibrate and rotate as quickly as 10 femtoseconds. A femtosecond is a millionth of a billionth of a second! The pulse rates achieved by the Qi laser can be as fast as or even faster than this mind bending speed of molecular vibrations.

These rates allow a process of molecular entrainment, literally matching vibrational rates in molecules. When rates are matched, just like kicking your legs at the right moment on a swing, the energy builds in the system. This allows the energy and thus the shape and function of molecules to be directly engineered and modified. This allows a given molecule to remain the same molecule yet be more effective for its intended purpose.

Exemplary of the profound effects of this method has been the production of high free energy therapeutic compounds. With the Qi laser system, it has been possible to create the world's first new form of aspirin²⁵ in over 100 years of research. Since the time of its first patent in the year 1900, only one form of aspirin existed and was stable at room temperature, until now. The state our lab has produced and patented is called a glass form that is clear and transparent in contrast to the usual white opaque crystal form of aspirin.

With its much higher free energy, this new form will dissolve and absorb faster than ordinary crystalline aspirin. Part of the reason that typical aspirin can cause bleeding is that the crystals are mechanically sharp and act like microscopic razor blades to make small cuts on the surface of the stomach. The new high energy form is free of these sharp edges.

Based on the physical chemistry of the new aspirin pro-

25 Ovokaitys TF and Strachan J. Room temperature stable non-crystalline aspirin and method for the preparation thereof. US Patent Number 8,377,989. May 2013.

duced with the Qi laser, it is expected to be absorbed 4-6 times faster and relieve symptoms 4-6 times faster as well. With an expected dosage reduction of 70-90 percent and free of sharp edges, the risk of side effects will be virtually eliminated.

The implications of this result are significant. The ability to create high free energy states of molecules that have not previously been possible opens whole new worlds of biological potential. Virtually any molecule could be more active at lower doses.

For a nutritional molecule the general purpose is enhancing the shape and energy for absorption and assimilation. Thus the absorption and use of a nutrient can be increased gram for gram through applying this method.

As another factor, if a nutrient creates an inflammatory response because of its shape and energy, it may possibly cause more harm than benefit to the tissue. In contrast, if the tendency to cause inflammation is eliminated, then the full potential of the nutrient to support and rebuild tissues can be realized.

Such an action has been demonstrated in studies of immune cells in culture²⁶ using Qi laser treated nutrients. Macrophages are a type of immune cell that ingests cellular debris and bacteria. If activated macrophages are fed with ordinary amino acids, the inflammatory response may more than double, as measured by an increase in the inflammatory marker tumor necrosis factor-alpha (TNF-alpha). When the Qi laser treated amino acids were given at the same dosage, this inflammatory effect was neutralized to the baseline level.

That such an effect is practical has been shown in a controlled clinical study. Persons with chronic heart failure either received Qi laser treated amino acids or were in the untreated control group²⁷. After 30 days, the treated group showed a statistically significant 25 percent increase in heart function. In contrast, the control group showed a 10 percent reduction of function. While the control group was clinically unchanged or worse, the treated group showed a remarkable 60-80 percent or greater reduction of symptoms. Perhaps most striking, abnormally dilated heart chambers reduced in size substantially towards normal. In contrast, persons in the control group showed further heart enlargement and worsening of function.

That the improvement in the treated group was due to true heart tissue regeneration was shown by a statistically significant increase in collagen production by the 10th day of using the formula. A relative increase in collagen production persisted in the treated group and had risen to more than double that of the control group by the 30th day. In contrast, there was

26 Ovokaitys TF and Strachan J. Laser enhanced amino acid blend and use of same to regenerate active myocardial tissue. U.S. Patent Number 8,404,733. March 2013.

27 Ovokaitys TF and Fedorov VS. Study of the amino acid complex "Complete Aminos" for the innovative treatment of chronic heart degeneration of multiple etiologies. Clinical Gerontology (Russian). 2011; 17 (9-10): 45-48.

no change in collagen production in the control group throughout the 30 day study.

The components of MethusaLife™ are treated with the Qi laser molecular enhancement technology. The intended result of this treatment is to increase the absorption and utilization of the nutrients in the formula.

Safety

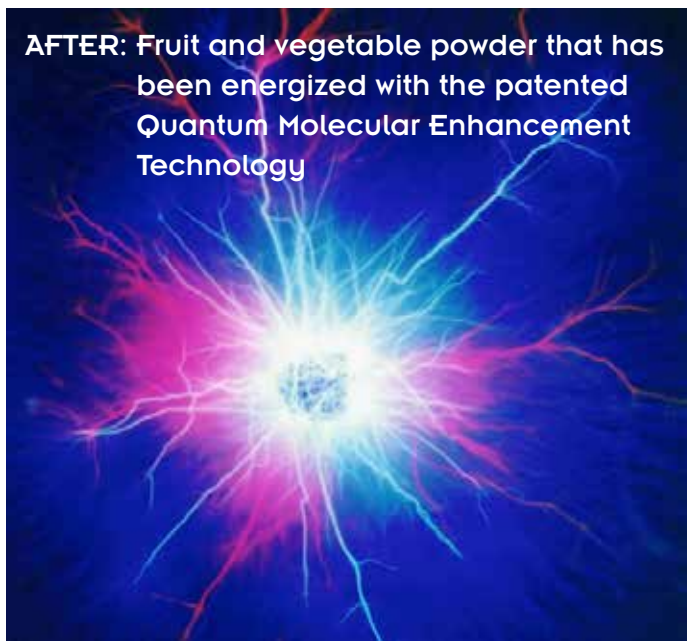
The MethusaLife™ formula is extremely safe. Toxicity testing in a laboratory found no harmful effects of any kind. The results suggested that an average adult could take 10 full bottles (each a one month supply) all at once without evidence of any adverse effects, suggesting a very high margin of safety.

As a further measure...

Precautions

Used as directed, the precautions are few. If there is a known sensitivity to any component of the formula, then its use should be avoided. If evidence of sensitivity occurs while using the formulation, further use should be avoided.

Some persons have an elevation of a chemical known as uric acid in the blood. This can predispose to crystals of uric acid forming in one or more joints, resulting in a painful condition known as gout. While this can affect a variety of joints and other tissues, the classic presentation is a very hot tender joint at the base of the great toe known as podagra. Uric acid is a by-product of the breakdown of the nucleic acid bases adenine and guanine. While the quantity of these DNA and RNA bases in the formula is well below the amount associated with precipitating gout, this has occurred in rare cases with very sensitive persons. Therefore persons with known elevated uric acid or a history of gout should use the formula only with medical supervision.



While the components and composition are likely to be safe during pregnancy, the formula has not been tested for use in this setting. Therefore its use is not recommended during pregnancy.

In contrast, there may be particular nutritional value to providing nucleic acids during lactation. Breast milk has a high nucleic acid content relative to formula milk and supplementation supports maternal recovery and breast milk composition. Infants fed formula lacking nucleic acids may be especially well supported with nucleic acid supplementation.

Recommendations for Use

For persons 18 and over, the suggested use is *3 sprays twice per day, or 6 sprays once a day for convenience*. Under conditions of stress, this intake may be doubled. Dosages higher than that should be taken only with the supervision and guidance of a health care professional.

For ages 12 – 17 recommended intake is also 3 sprays twice per day.

For ages 6 – 11 recommended intake is 2 sprays twice a day.

For ages 3 – 6 recommended intake is 1 spray twice a day.

For ages 1-2..... recommended intake is 1 spray per day.

For this study, the threshold for statistical significance was whether the probability was less than 1 in 20 that the results could be due to chance alone. The symbol p stands for probability and a value of $p < .05$ would therefore be considered to have met this standard.

The achievement of a statistically significant difference between treated and control groups is evidence that the treatment was the cause of the benefit. If the probability is greater than 1 in 20 for a given result, this is considered to be statistically not significant. This is abbreviated $p = NS$.

Phase One

The first phase of the study recruited 20 sedentary males between the ages of 30 and 60. As a major objective of the study was to see whether the formula would lower homocysteine, subjects were chosen with at least a modest elevation of this factor. Thus only subjects with a screening level of homocysteine of 10 or greater were accepted.

Persons requiring medication were excluded. Use of supplements within 6 weeks of the study also resulted in exclusion.

The 20 subjects accepted were briefed about the protocol and signed informed consent. The participants were randomly assigned either to receive MethusaLife™ 6 sprays in the morning under the tongue and hold for 30 seconds or a placebo of 6 sprays with flavoring only but no active ingredients taken in the same manner.

Pre-testing was done with a panel of blood chemistries, physical measurements, and tests of cardiorespiratory fitness. Post-testing of these same measures was done after 90 days.

Results: There was a statistically significant difference between the homocysteine levels of the treated group after 90 days of use of the active formula ($p < .05$). The average level of 10 at pre-testing dropped to 8.5 post-testing, a 15 percent reduction. In contrast, there was no significant difference between the pre-test and post-test homocysteine levels ($p = NS$) for persons in the placebo group (13.9 to 13.6, only a 2 percent decrease).

The other major statistically significant difference was an increase in serum folic acid levels in the persons taking the active formula ($p < .05$). The average value increased from 24.9 to 33.9, a remarkable 36 percent rise (normal range 7.0 – 39.7 nanomoles per milliliter). In comparison, there was no significant change in the placebo control group (18.1 to 18.7, a 3 percent increase, $p = NS$).

Phase Two

The second phase of the study compared the results of MethusaLife™ plus exercise to exercise alone. 36 sedentary males from the ages of 30 to 60 were recruited. Subjects were neither on medications nor taking nutritional supplements. All subjects had screening homocysteine levels greater than 10.

Subjects were randomly assigned to be in the exercise plus active formula group or exercise plus placebo group. Each subject took 6 sprays in the morning, whether it was the active or placebo preparation. The recommended exercise was 30 minutes of brisk walking or equivalent 5 times per week.

All subjects underwent a pre-test before starting and a post-test after using MethusaLife™ supplementation or placebo for 60 days. All measurements and procedures were performed at the Institute for Sport Research at the Sport Centre of the University of Pretoria. Testing included a panel of blood tests, more extensive measurements of body proportions and composition than in phase one, and measures of cardiorespiratory function.

Blood Chemistry Physiologic Age Measures

Pre-test homocysteine levels were an average of 12.5 for the active formula group and 12.3 for the placebo group. After the study period homocysteine in the treated group dropped 14.4 percent to 10.7, essentially the same percentage reduction as in the phase one group without exercise. In contrast, the placebo group showed little change at 11.9 in the post testing, a 3 percent reduction.

Folic Acid Levels

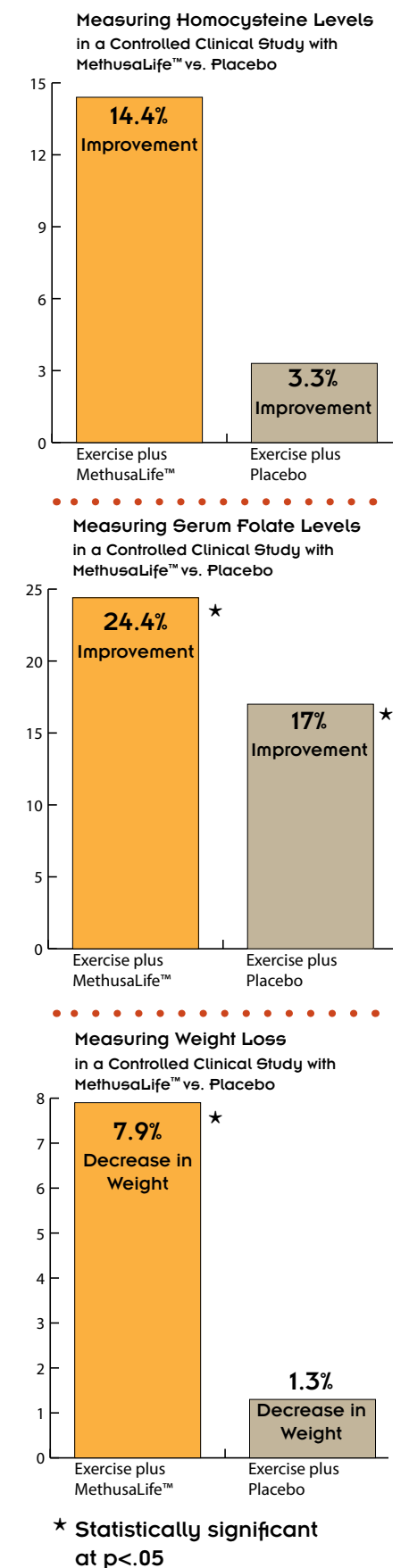
Serum folate levels during pre-testing were essentially the same at 24.4 for the active supplementation group and 23.6 for the placebo group. At post-testing, the active formula group showed a statistically significant 26 percent increase to 30.7. The placebo group showed a statistically significant increase of 17 percent at 27.6.

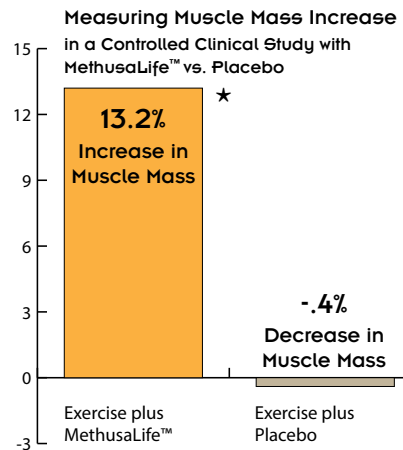
Weight Reduction

Remarkable improvements were seen in body mass and composition in the persons adding the active formula to exercise during the study period. The average decrease in body mass was statistically significant at 15.9 pounds (7.2 kilograms) from 199.3 to 183.4 pounds (90.6 to 83.4 kilograms, $p < .05$). In comparison, the placebo group went from an average of 188.5 to 186.1 pounds (85.7 to 84.6 kilograms), a weight reduction of only 2.4 pounds (1.1 kilogram, $p = NS$).

Building Muscle Mass

The most remarkable difference was a dramatic statistically signif-

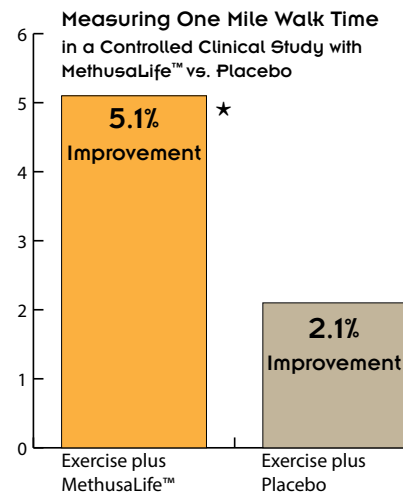




icant increase in muscle mass in persons taking the active formula. Muscle mass increased on average from 93.1 to 105.4 pounds (42.3 to 47.9 kilograms). This represents 12.3 pounds (5.6 kilograms) of muscle building. This is a 13.2 percent increase in muscle mass in just 60 days. In contrast, the placebo group changed from 108.7 to 108.2 pounds (49.4 to 49.2 kilograms), or a loss of .5 pounds (.2 kilogram) of muscle mass (p=NS), a .5 percent reduction.

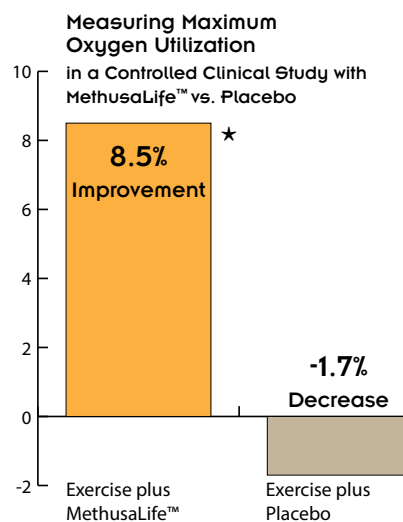
Aerobic Cardio-respiratory Fitness – One Mile Walk Time

Differences were also seen in measures of cardio-respiratory fitness in those taking the active formula. One mile walk time was statistically significantly decreased from 13.5 to 12.8 minutes in this group, traversing the distance 5 percent faster. In contrast the placebo group showed a change that was not significant from 14.2 to 13.9 minutes, only a 2 percent reduction.



Aerobic Cardio-respiratory Fitness – Maximum Oxygen Utilization Capacity

Aerobic capacity showed a statistically significant increase in maximum oxygen utilization, or VO2 max, in those taking the active formula. Estimated VO2 max increased from 40.1 to 43.5 milliliters of oxygen per kilogram per minute. This is nearly one full metabolic unit higher, with one unit equal to 3.5 milliliters of oxygen uptake per kilogram per minute. This represents an 8.5 percent enhancement of aerobic capacity during the study period. In contrast, the placebo group showed a reduction of VO2 max from 41.4 to 40.7 units, or a 1.7 percent decrease (p=NS).



The comparisons between the exercise groups using the active formula versus placebo are shown in graphs throughout this chapter.

Discussion

The 1.5 point drop in homocysteine in the first phase of the study reflected a statistically significant 15 percent reduction of this value. The reduction of 14.4 percent in the second phase from 12.5 to 10.7 nearly reached the threshold of statistical significance at .06 but did not quite cross it. If there were a slightly larger study group, it is likely the p value would have reached <.05.

A yardstick for comparison is the Scandanavian study that mea-

★ Statistically significant at p<.05

sured homocysteine levels across a population²⁸. Using this graph of homocysteine level versus age, an estimate can be given of the reduction of physiologic aging chemistry the study results represent. In this range of values, homocysteine lowering in the treated group suggests an 8 to 12 year reversal of this biomarker of aging.

Related work in our lab indicates that this composition would be expected to show a dose response curve. This means that the greater the intake of MethusaLife™, the lower the homocysteine would tend to go.

As to serum folic acid levels, both phases of the study showed a statistically significant increase with the use of the active formula. This indicates that the delivery system was effective for the absorption of this nutrient. In the first phase, the placebo group showed a negligible change in folic acid levels. In the second phase, the placebo group showed a statistically significant increase in folic acid, though of lesser magnitude than the treated group. This reflects the known phenomenon of folic acid levels increasing with exercise. In the second phase, there was no additional rise in the active formula group related to exercise. Suggesting that delivery was already optimized by the formulation.

The marked increase in muscle mass in the treatment group in the second phase is highly significant. As in studies using human growth hormone this degree of increase in muscle mass reflects the body being approximately 10-15 years physiologically younger. Perhaps as much or more any biomarker, boosting muscle mass increases strength, function and quality of life.

Comparably important for those taking the active formula, were the statistically significant improvements in markers of cardiac and respiratory fitness. The 5 percent reduction in one mile walk time and the 8.5 percent boost in VO2 max reflect a meaningful enhancement of aerobic capacity in only 2 months. Based on tables of VO2 max versus age, this level of increase suggests a 5-8 year reversal of this biomarker.

In phase two, persons taking the active formula reduced weight, increased muscle mass and improved aerobic capacity. This represents an ideal balance for improving functional performance, and enhancing youthfulness.

Summary and Conclusions

This randomized controlled trial provides statistically significant evidence of the reversal of several important biomarkers of aging for those taking the active formula. Biochemical age markers, body weight, muscle mass, and aerobic capacity all improved remarkably if 30 minutes of brisk daily walking was performed consistently while taking the formula. The use of MethusaLife™ can therefore be advised as a component for inclusion in an anti-aging program.

28 Brattstrom L, Lindgren A, Israelsson B, et al. Homocysteine and cysteine: determinants of plasma levels in middle-aged and elderly subjects. Journal of Internal Medicine. 1994; 236: 633-641.

Personal Reports

In addition to the results of the controlled clinical trial, there have been several interesting anecdotal observations. Perhaps most amazing was the change seen in a delightful woman who had snow white hair when I had last seen her. When I saw her again she had been using the formula for a few months. She was proudly showing me the dark hair that was growing from her previously snowy roots!

Another observation with hair was made from a clinic using scalp laser treatments, nutritional supplements, and topical 5 percent minoxidil to regrow hair. The program was generally very effective at getting more hair to grow after 6 months of using the protocol. The owner of the clinic was very excited to tell me that using the MethusaLife™ formula they were seeing as much hair growing in 2 months as usually only occurred after 6 months.

There have been many reports of the easing of menopausal symptoms. There are even reports of the symptoms going away because the menses have returned! Not everyone wishes this result though it is possible for this to occur. And if the cycles come back so may fertility. Whether one desires to conceive, or for this not to be so, the usual considerations would apply.

The formula may provide rapid muscular recovery from strenuous physical activity. One Junior Olympic swimmer used the formula after every heat and final and won 7 gold medals at a major international meet.

The burn after heavy weight lifting also relieves quickly and supports increasing workout intensity and better muscle building. Combined with Qi laser activated amino acids, as in the formula Complete Aminos™, elite weight lifters and athletes have increased core strength as much as 30 percent in just 1-2 months. For such highly trained persons even a 5 percent increase in performance can otherwise prove challenging to achieve.

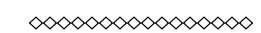
Cosmetic effects may also be significant. There have been many reports of diminishing wrinkles, blemishes fading, and the skin appearing more youthful.

Having sufficient well delivered nucleic acids is vital for every type of tissue and cell to regenerate. For a given person, one system or another may have less than ideal repair if the supply is not sufficient. Results can thus vary from individual to individual as to which system of the body shows outward or inward enhancement when the relative deficiency is overcome.

Reference

Brattstrom L, Lindgren A, Israelsson B, et al. Homocysteine and cysteine: determinants of plasma levels in middle-aged and elderly subjects. Journal of Internal Medicine. 1994; 236: 633-641.

CHAPTER 6



THE ANTI-AGING POWER OF PHYTONUTRIENT ANTIOXIDANTS

The term “phyto” refers to plants. Over millions of years of evolutionary history plants have created powerful natural internal chemistries that protect themselves from stress and injury. Such a plant-derived compound is called a phytonutrient.

Oxidation in particular is the process whereby the body burns fuel such as carbohydrate and fat and converts it into energy in the form of ATP. Oxidation “burns” things and makes them more reactive. The body needs oxidation to provide the energy for life processes and to generate numerous internal chemistries required for healthy cellular function.

The double-edged sword is that negatively charged oxidation by-products called reactive oxygen species are also produced through these processes. These can create an oxidative chain reaction that can damage as many as 5000 DNA, protein or cell membrane molecules per reactive oxygen species if left unchecked. Coming to the cell’s rescue to prevent cell injury and accelerated aging are antioxidants.

Another term for potentially destructive reactive oxygen species are free radicals. They need to have their imbalanced charge neutralized by an antioxidant to stop the chain reaction of damage. That is what antioxidants do.

The ORAC Scale

There is a standard measure of the relative antioxidant power of a particular phytonutrient or other antioxidant source. This metric is called the Oxygen Radical Absorbance Capacity, or ORAC scale.

A typical serving of fruits and vegetable has an ORAC value of 350–500 units. The standard recommendation for health is 5–7 servings of fruits and vegetables per day. There is a vast body of evidence for health benefits throughout all bodily systems by consuming these amounts, yet only a minority of adults accomplishes this intake.

To simplify this health giving intake level, our lab has created a formula called Phyto5000. In 6 years of development, the highest quality and potency phytonutrient concentrates were sourced from around the world. The objective was to provide an ORAC level of 5,000 or more per capsule, or the equivalent value of at least 10 high level servings of fruits and vegetables per capsule.

This formula, after its Qi Laser activation, was sent to a laboratory to test its performance. For a formula to be fully protective it must address 6 major different types of oxidative stress systems in the body. When the testing was done, it was found that the formula was full spectrum and provided significant protection for all six of these types of free radical stresses. This is an important distinction. A product may have a high rating but be limited to protection for only one or two of the oxidant stress factors, leaving gaps in coverage.

The equivalent ORAC value was provided for each of these types of protection. While the target value was 5,000 per capsule, the total equivalent ORAC value measured was over 42,000 units per capsule!



Some of the many antioxidant ingredients in Phyto5000 formula

A single capsule thus offers a full spectrum of antioxidant defense. This can fill the gap between the number of servings of fruits and vegetables it is ideal for us to eat and the number actually consumed.

To verify that the formula performs at a level suggested by its ORAC potency a controlled clinical trial was performed. The results of the study will be reviewed at the end of this chapter after describing some of the key ingredients of Phyto5000.

Lutein

Protecting the eye from age related macular degeneration requires lutein, a carotenoid antioxidant that specifically concentrates in the macula of the retina. Studies have found that diets rich in lutein carry a greatly reduced risk of macular degeneration, the leading cause of blindness in the US²⁹. In addition, lutein protects the skin from visible signs of aging, studies showing an increase in hydration and elasticity.

Ginkgo biloba

In addition to high quality, high potency lutein, Phyto5000 contains Ginkgo biloba. Studies have shown that psychological and mental states may be improved and balanced if this nutrient is used³⁰. Other work has focused on how Ginkgo enhances circulation in the brain that can improve memory and cognitive skills even if significant memory loss has already occurred. Ginkgo also supports the delicate circulation of the eye. Providing ginkgo thus enhances the ability to deliver phytonutrients to the eye to preserve and enhance vision.

Bilberry

Another potent component is a luxurious highly concentrated bilberry extract, very well known as a vision enhancer. Perhaps the most interesting report thus far is a person who noted improved vision within one hour of the first capsule.

Resveratrol

To further enhance the potency of the formula, resveratrol has been added. This is a powerful antioxidant found particularly in the skins of red grapes.

For years, medical science had been mystified by the so-called “French Paradox.” The observation was that the French diet was rich with a high cholesterol and saturated fat content which suggested there would be an increased risk of cardiovascular disease.



© Andrew Curtis

29 Granado F, Olmedilla B, and Blanco I. Nutritional and clinical relevance of lutein in human health. *British Journal of Nutrition*. 2003; 90: 487–502.

30 Brondino N, DeSilvestri A, Re S, et al. A systematic review and meta-analysis of Ginkgo biloba in neuropsychiatric disorders: from ancient tradition to modern day medicine. *Evidence-Based Complementary and Alternative Medicine*. 2013; Article ID 915691: 11 pages.

The paradox was that cardiovascular disease was found to be surprisingly low.

The association of the red wine with the reduced cardiac risks and greater and even significant longevity benefits, was the first cue to solving the French Paradox. Given that comparable health benefits were not seen drinking white wine, this put the emphasis on the natural pigments distinguishing the reds from the whites. This inquiry bore rich fruit in a landmark study reported from Harvard University.

Resveratrol, a deep red brown phytonutrient antioxidant from the skin of red grapes was tested for its effects in mice fed a high fat diet³¹. The control mice not fed resveratrol became obese, showed elevated cholesterol and triglycerides, developed fatty livers with liver inflammation, showed accelerated atherosclerosis with progressive narrowing of blood vessels and had shortened survival. In contrast, the mice given resveratrol gained much less weight, had relatively reduced lipid profiles, showed protection from fatty liver and inflammation, had decreased adverse effects on their blood vessels, and had greater longevity.

It looked like the “French Paradox” in action! Animals given a rich fatty diet when given a red wine extract showed protection of their liver, their blood vessels and their heart – and they lived significantly longer.

Resveratrol first attracted intense scientific attention when it was linked to the cardiovascular benefits of red wine and found to have potent anti-tumor activity as well³². In 2003, it was found that resveratrol was the most active of numerous small molecules tested for the activation of the SIRT1 gene³³ and the generation of its product known as a sirtuin. Activating sirtuins are broadly anti-aging, with several studies of resveratrol showing that these compounds increase the life span of species as varied as yeast, roundworms, and fruit flies in a sirtuin-dependent manner³⁴. Even otherwise short-lived species of fish showed remarkable anti-aging and life extension effects under the influence of resveratrol³⁵.

The mammalian sirtuins (SIRT1 – SIRT7) are active in numerous fundamental cellular processes including switching genes on and off, DNA repair, and metabolic regulation³⁶. Of particular note, activating sirtuins also appears to be a central mechanism of the anti-aging effects of caloric restriction. Of all methods tested thus far, the most consistent method for life span enhancement across

31 Baur AJ, Pearson KJ, Price NL, et al. Resveratrol improves health and survival of mice on a high calorie diet. *Nature*. 2006; 444: 337-342.

32 Jang M, Cai L, Udeani GO, et al. Cancer chemopreventive ability of resveratrol, a natural product derived from grapes. *Science*. 1997; 275: 218-220.

33 Howitz KT, Bitterman KJ, Cohen HY, et al. Small molecule activators of sirtuins extend *Saccharomyces cerevisiae* lifespan. *Nature*. 2003; 425: 191-196.

34 Agarwal B and Baur JA. Resveratrol and life extension. *Annals New York Academy of Sciences*. 2011; 1215: 138-143.

35 Valenzano DR, Terzibasi E, Genade T, et al. Resveratrol prolongs life span and retards the onset of age-related markers in a short-lived vertebrate. *Current Biology*. 2006; 16: 296-300.



species is reducing caloric intake typically to about 30 percent less than usual. This will increase the life span of mice and other mammals by 50 percent or more, and it is believed to be promising for raising the bar of human life span as well. Thus taking resveratrol provides the merits of the French Paradox and could also offer life span enhancement otherwise requiring the harsh discipline of caloric restriction. How's that for a lifestyle boon!

An additional profound benefit is that resveratrol induces an increase in mitochondrial number and biological activity. Mitochondria are “mighty engines” in the cell that take in glucose and fats and use them to produce energy in the form of ATP. The more mitochondria and the more active they are, the easier it is to burn sugar and fat and the more energy the cells have for detox, regeneration and repair. And the more energy you have for all your life activities. Having more mitochondria is like giving your cells a bigger engine to have more power and more reserves of power (and burn more fat too).

36 Price NL, Gomes AP, Ling AJY, et al. SIRT1 is required for AMPK activation and the beneficial effects of resveratrol on mitochondrial function. *Cell Metabolism*. 2012; 15 (5): 675-690.

The reported benefits of resveratrol thus include:

- Reducing the adverse effects of fat on weight gain
- Protecting blood vessels from harmful effects of fat
- Maintaining better levels of cholesterol and triglycerides
- Protecting the liver from inflammation and fat accumulation
- Better metabolism
- Increasing cellular and physical energy
- Greater endurance
- Anti-tumor effects
- Antioxidant action
- Life extension

Green tea may assist in achieving and maintaining healthy blood pressure. Weight loss appears to be facilitated through improved ability to metabolize fat.

**Green Tea and White Tea Extracts**

Numerous studies have detailed the health promoting benefits of using green tea, as recently reviewed by Chacko et al³⁷. White tea is derived from the tender early buds of green tea, is especially prized, and even higher in antioxidant content.

The literature on green tea is so impressive it reads as a head to toe health elixir. Especially well studied is its highly potent antioxidant compound EGCG, or epigallocatechin gallate. Like resveratrol this is a so-called polyphenol antioxidant. Green tea supports EGCG with several related antioxidant compounds in an elegant orchestra of multi-faceted free radical neutralizing actions. Drinking green tea has been associated with significantly increased levels of antioxidants in the blood plasma.

Drinking 2 cups per day has been associated with a significant reduction in the risk of breast cancer, and the risk may be decreased even more at 8 cups per day. Population studies have also associated using green tea with reduced the risks of tumors of the colon, lung, pancreas, esophagus, small intestine, mouth, stomach and kidneys.

Green tea may reduce the mutagenic tendencies of environmental toxins and cigarette smoke. The mechanism appears to be increased liver metabolism of chemical carcinogens into inactive compounds that can be easily eliminated.

Evidence from animal and human studies suggests there may be favorable effects on blood sugar metabolism and triglyceride levels. Antioxidant activity of the lining of major arterial vessels also appears to be enhanced. All these factors support the health and wellness of the cardiovascular system.

Since ancient times it has been known in Asia that green tea may accelerate recovery from diarrhea and typhoid. There are also indicators of supporting the immune system with respect to the flu and Herpes simplex outbreaks.

Green tea strengthens the immune system through protecting from the inflammatory effects of oxidants and free radicals. Test tube and animal studies suggest significant protection of nerve cells from the harmful effect of inflammation. Other evidence suggests a possible benefit of building the brain with respect to risks of Parkinson's or Alzheimer's degenerative processes. Other evidence indicates that the lens of the eye has reduced cross linking that can cause cataracts if green tea polyphenols are consumed. Green tea is also useful for insect stings through reducing inflammatory effects.

For systemic antioxidant protection, green tea is among the longest used historically and the best studied scientifically. Whether it is consuming 2 or more cups per day or using concentrated supplement extracts, green tea has been shown to support the healthy structure and function of almost every bodily system.

Pine Bark Extract

Another potent antioxidant with extensive clinical study is the extract of the French pine tree, *Pinus maritimus*, and related species. The bark, like green tea, contains many powerful polyphenol antioxidant compounds. Whether strengthening the joints, the cardiovascular system, or supporting a healthy immune system, the reported effects of pine bark extract are widely systemic.

An especially interesting study combined pine bark extract with the amino acid arginine. As described in Chapter 8, arginine is used as the source molecule to produce nitric oxide that strengthens vascular and many other functions. In a study that combined 1.5 grams of arginine with 60 mg or 120 mg of pine bark extract, erectile function was significantly and safely strengthened. Results were comparable to the use of Viagra[®], especially at the higher level of pine bark extract. This natural vascular support protocol, unlike Viagra[®], was free of any significant adverse effects.

In order to offer such a natural protocol, each capsule of Phyto5000 contains 60 mg of pine bark extract. 3 capsules of the Nitroxx formula would provide 1.5 grams of the Qi Laser activated arginine.

Blueberry Brain Builder

Blueberries are especially rich in potent polyphenols. In addition to the broad benefits of these anti-

37 Chacko SM, Thambi PT, Kuttan R, et al. Beneficial effects of green tea: a literature review. Chinese Medicine. 2010; 5: 13-21.

oxidants, ingesting blueberries or their concentrated extracts has proved the king of berries for the brain. Unlike all other berry extracts thus far tested, blueberries are the only berry that makes the brain younger. The ability of the brain to be flexible and learn new things is called plasticity. Taking blueberry extracts but not that of other berries in animal studies increased the brain plasticity of older animals to be comparable to that of younger animals.

Blueberries not only taste great they are one of the most powerful brain rejuvenators ever studied. Phyto5000 provides especially potent concentrates of wild blueberries.

Goji the Immortal Berry of Tibet

Also known as the Wolfberry, Goji berries are fabled to impart legendary anti-aging effects. An online report described an ostensibly verifiable life span of over 250 years in one of its users. He was described as a scholarly teacher who had learned every trick of his students in the books. It has not been possible to substantiate this story, though the berries do contain an excellent antioxidant profile. And in case the legends are true, consuming concentrated Goji may further support your quest for enhanced longevity.



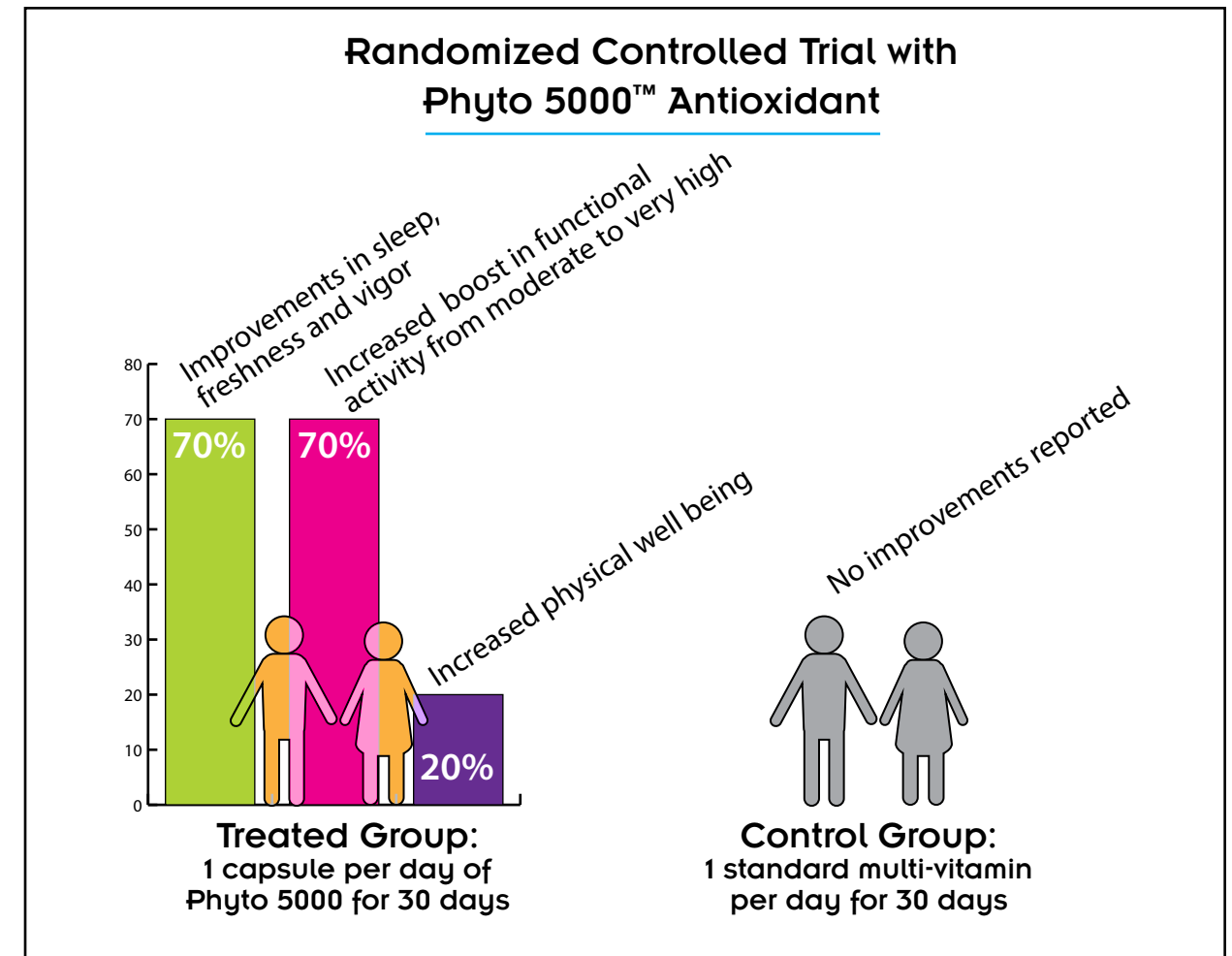
Goji berries: A powerful ingredient in Phyto5000

In addition, the formula contains numerous other potent botanical extracts, and natural vitamins A, C and E. These offer a wide spectrum of potent nutrients to create a symphony of overlapping protective pathways.

Anecdotal reports of the use of this formula center on a greater sense of well-being, improved sleep, and support of healthy blood pressure. Beyond the anecdotal, the formula has also been subjected to clinical study with the results as below.

Controlled Clinical Trial

A randomized controlled trial (RCT) was done with 20 persons in the treated group and 15 in the control group, both groups being of mixed gender. The treated group took one capsule per day of Phyto5000. The control group took a standard local multivitamin preparation. After 30 days of treatment, using subjective rating scales, the baseline scores were compared to the follow-up results. With respect to the control group, none of the patients noted any improvement in quality of life scales,



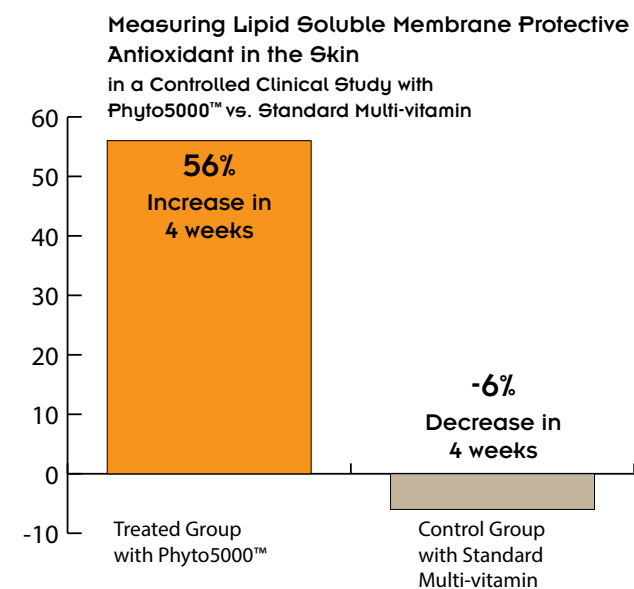
and some had a small not statistically significant worsening.

In contrast, the treated group showed statistically significant improvements ($p < .05$) in the following:

- Sleep**
- Functional activity**
- Physical well-being**
- Relief of fatigue**
- Reduction of headaches**

As to the level of improvement in the treated group, 70 percent of persons noted improvements in sleep and freshness and vigor in the morning. 20 percent of treated persons observed increased physical well-being and 45 percent noted improved emotional well-being (though this did not quite achieve statistical significance). Remarkably, 70 percent of persons reported an increase in functional activity from a moderate to a very high boost in function.

In sum, persons in the treated group enjoyed more refreshing sleep and had more energy upon awakening. Overall, their sense of well-being was enhanced. These improvements translated to being significantly more active and functional.



Baseline and follow-up testing was done to assess whether body antioxidant function was objectively affected. A spectroscopic method was used that measures lipid soluble membrane protective antioxidants in the skin. Over 30 days, the control group showed a 6 percent decrease from 19.8 units to 18.6 units ($p = \text{NS}$). In contrast, the treated group showed a statistically significant 56 percent increase ($p < .05$) from 17.2 units to 26.8 units.

What is notable is that in treated group the total body antioxidant level increased 27 percent at 2 weeks and 56 percent at 4 weeks. This suggests a linear increase in antioxidant

levels over time that had not yet reached a plateau. Longer term study will be needed to see just how high the antioxidant protection may rise with more prolonged use.

It is also relevant that the control group received a standard multivitamin product and not an inert placebo. This suggests that relatively low antioxidant effects were delivered with such a product. In contrast, the highly concentrated activated phytonutrient blend showed measurable increases in quality of life factors, as well as boosting total body antioxidant status.

For persons who consume at least 5–7 servings of fruits and vegetables per day, Phyto5000 can fill in any gaps of antioxidant functions and actions. For persons who consume less than this amount, this formula offers an easy way to support the health of your cells and tissues in the face of the many oxidant stresses in our environment. The salutary effects in quality of life can be felt in as little as a month.

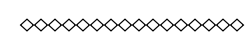
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Phyto5000 ingredients:

Vitamin A (Beta Carotene), Vitamin C (from Acerola Berry), Vitamin E, Grapeseed, Blueberry, Bilberry, Cranberry, Tart Cherry, Prune, Raspberry, Strawberry, Resveratrol, Quercetin, Maritime Pine Bark Extract, Ginkgo Biloba Extract, Green Tea Extract, Green Coffee, Acerola, Camu Camu, Acai, Mangosteen, White Tea, Pomegranate, Lutein, Grapeseed Extract, Wild Blueberry Extract, Citrus Bioflavonoids, Rutin, and Lotus Leaf.

CHAPTER 7



THE RIGHT FAT IN THE RIGHT PLACES CAN SAVE YOUR LIFE:

Clearing Toxins, Repairing Membranes
and Enhancing Fat Metabolism

The proper metabolism of fat is essential to good health. A specialized form of fat surrounds each cell and is necessary to maintain cell integrity. Fat is used to make other important molecules for the structure and function of particular cells and tissues. Fat is an efficient fuel for generating energy, and is stored as a concentrated reserve of energy. Many poisons are soluble in fat and can be stored in and accumulate within the fat, protecting cells from immediate damage yet creating a risk of long term cumulative toxicity. A comprehensive life extension plan addresses each of these fundamental areas of function and metabolism of fat.

The first priority in living younger and longer is to keep toxic stresses from the environment impairing your function and limiting your potential. These stresses are legion and at best are avoided or at least their antidotes taken.

These include but are not limited to:

1. *Fat soluble toxins:*

These accumulate in fat to higher and higher levels causing increasing disturbances until they are cleared. These poisons are particularly prevalent as insecticides and pesticides in food, as

preservatives, as plasticides released from water bottles left in the sun, and many other industrial chemicals present in air, water and food. In addition, some medical treatments such as cancer chemotherapy can leave a heavy residue in tissue. These toxins collectively can disturb male and female hormones and may result in erectile dysfunction, loss of libido, fertility problems, disturbances of breast and uterine health, including the development of breast tissue in small children. Some of these chemicals are directly toxic to the brain and can impair cognitive function with brain fog, emotional instability, and memory lapses. Direct toxicity to almost every tissue, as well as an increased risk of tumor formation, may result from excessive accumulation of a plethora of potentially presented poisons.

2. *Heavy metals*

These are present especially in larger fish such as salmon and tuna that can accumulate toxins such as mercury in the food chain. Lead, mercury, and arsenic may be present in food as a function of where and how it is grown, or as an exposure in the water table. Mercury amalgam fillings in teeth can provide a constant exposure. Though mercury amalgam fillings are best taken out or never used, when removed it is very important to use controlled conditions to prevent a large acute toxic load from solid and vaporized mercury. While less prevalent, lead may still be inadvertently ingested in paint chips or be present in water as a contaminant resulting from lead plumbing. Immunizations may contain mercury as a preservative, and such exposure is now aggravated in children due to greater numbers and types of immunizations being given than in the past. Moonshine can have a high lead content and show the classic toxicity of severe brain, liver and kidney injury, as well as a greater risk of gout (accumulation of uric acid crystals in a joint causing severe pain). These are just some of the many ways and types of toxic heavy metal exposures that can occur. Heavy metals tie up biological sulfur in proteins and enzymes, and can cause such broad toxicity almost any symptom could be caused or aggravated by their excessive presence.

3. *Radiation*

Now more prevalent in the environment due to such mishaps as the Fukushima nuclear disruption with release of radioactive elements. Depending on where one lives and one's housing structure, background radiation such as from radon gas from the earth can also be a significant factor. As a medical treatment, radiation may be intentionally given. Particularly worrisome is contamination of fish, air and water from nuclear accidents that may cause marked increases beyond the usual background radiation. The nature of radiation injury is that high energy particles are released and shoot through tissue like miniature cannon balls. This can damage and disrupt the cell membrane, proteins and even DNA itself. The harmful effects also include generating reactive oxygen species and oxidative stress that can result in a cascade of injury to many more biomolecules than the initial insult. A high level exposure can so suppress the immune system and disrupt the intestinal lining that survival is threatened. Lower grade exposure can increase the risk of malignancy if sustained over time without an antidote.

4. *Electrosmog*

In the past 20 years our exposure to electromagnetic field stress has increased almost exponentially. The exposures are particularly from mobile phones and cell phone towers, the use and number of which are becoming ever more prevalent. There are also electromagnetic stresses from power lines, transformers, wiring in homes and workplaces and many other sources. While not confirmed there are suggestions that the electro-stress has been a part of the epidemic increase in autism in children. There are also suggestions of increased risks of various types of tumor formation.

5. *Alcohol*

Of all the toxic stress factors, alcohol is perhaps unique in that we voluntarily subject ourselves to its effects as a cultural phenomenon. In moderate amounts and occasional use, the liver is able to metabolize the alcohol and minimize potentially harmful effects. Chronic use, however, of two or more drinks per day can cause fat accumulation and inflammation. This development of so-called fatty hepatitis may already be life threatening and can become increasingly so the longer alcohol is consumed in excess of the liver's capacity to neutralize its effects.

While not comprehensive, this list gives an overview of the common toxic factors that can impair organ function, create health risks, and reduce quality of life. These factors can accelerate aging whereas the focus of this plan is to turn the clock in the other direction. Thus a key part of any program to grow younger is to avoid or at least neutralize the effects of such environmental stressors as much as possible.

Nutrients that assist the body to metabolize and detoxify fat are known as lipotropic. The Qi laser-activated formula called Liver Spa™ consists of the triad of lipotropic nutrients well studied to assist the metabolism of fat³⁸:

1. **Choline** – a vital part of cell membranes, also is part of the molecule acetylcholine, the key brain chemical for short and long-term memory.
2. **Inositol** – an essential cell membrane stabilizer that participates in boosting fat metabolism.
3. **Methionine** – a sulfur amino acid with many health benefits for detoxification and for building and repairing tissue proteins. Methionine is a driver of a chemical cycle with highly active biological sulfur compounds. From this cycle, there will also be produced the detoxifying antioxidant compounds cysteine and glutathione.

Systemically, the potential benefits are as follows.

38 http://balancedconcepts.net/liver_phases_detox_paths.pdf

Fat Soluble Toxins

A vital set of processes neutralizes and clears a wide spectrum of fat soluble toxins. These increase the efficiency of detoxification while minimizing symptoms of toxin elimination.

1. **Increasing fluidity of cell membranes** – this makes it easier to get the lipotropic nutrients into the cell and pull the toxins out.
2. **Neutralizing toxins** – this occurs particularly through combining the toxin with one of the lipotropic nutrients or their derivatives, especially glutathione.
3. **Lipotropic action** – increasing the metabolism of fat to liberate toxins that have been neutralized so they can be cleared.
4. **Greater aqueous solubility** – the toxic species are also made more water soluble so they can move into the blood stream and be cleared from the body. Principal factors making this possible are glutathione and the sulfur amino acids methionine and cysteine. In addition, methionine combines with ATP such as provided in MethusaLife™, to produce S-adenosyl-methionine (also known as SAME). This potent compound can also reduce or eliminate the hazard of a broad range of fat soluble toxins, including excess estrogens.
5. **Elimination of toxins** through being transported into the plasma and cleared in the kidneys, or through the action of bile in the liver and excreted through the gastrointestinal tract.

Liver Spa™ will permit most people to neutralize and clear environmental poisons without detox symptoms. Occasional persons who are heavily burdened, however, may experience cleansing-related phenomena such as headache, nausea, rash, diarrhea, or flu-like symptoms. If they occur at all, these are usually mild and will resolve by taking a break until symptoms resolve. The formula can be started again at a reduced level such as one capsule per day and continued as long as detox symptoms do not return. After one week the amount can be increased by one capsule per week until the full amount of 2 capsules twice per day (or 4 capsules once a day) can be taken.

The detox process is further augmented by consuming cruciferous vegetables such as broccoli, cauliflower and Brussel sprouts with proven sulfur-rich antitumor compounds. Supportive herbs include caraway, dill, milk thistle and sassafras tea. Additional foods supporting detox include asparagus, blue green algae, onions, garlic and shallots, and artichoke leaf.

A word of caution is that the ingredients of Liver Spa™ tend to pull in moisture from the air. If this happens, the egg-like smell of the sulfur compounds and the fishy smell of choline may intensify. Keeping the formula in a cool and dry place, even the refrigerator if your environment is especially humid, will tend to reduce this issue. In general the formula will still be fine to use though if there is a question the capsules should be returned for an evaluation. Future iterations will increase the intensity of the drying system to counteract the strong natural tendency of the formula to attract moisture.

The Liver Spa™ formula is quite safe to use with few precautions, such as known sensitivity to any of

the components. Rarely persons taking choline may develop a fishy odor. This usually only occurs at about triple the recommended use.

Heavy Metals

Among the best ways to remove heavy metals is the use of the sulfur amino acids. These sulfur compounds can pull the heavy metals from the sulfur sites to which they are bonded in tissue. The compounds Liver Spa™ delivers have the benefit of binding toxic metals more tightly than chemical treatments like EDTA (ethylene diamine tetra-acetic acid). Thus they are less prone to “leak” metals into the blood when they are being pulled out of tissue and symptoms of toxic metal release are thus unlikely. In practice there have not been reports of metal-leak side effects that can occur with EDTA. By safely transferring the metals from tissue proteins to the sulfur compounds for excretion, the poisoned proteins can be brought back to vibrant life.

Radiation

Methionine offers protection for radiation exposure, whether from food or environment, or during radiation therapy. The lipotropic nutrients accelerate cell membrane recovery and protect proteins and DNA from oxidative stress.

MethusaLife™ offers additional protection through the action of ATP and nucleic acids. As a “cocktail” of synergistic action, MethusaLife™ and Liver Spa™ together provide a powerful protective combination to support tissue health in the face of radiation stress.

Electrosmog

One of the theories of the adverse effects of electrosmog is that it stresses and stuns the cell membranes. This is especially so for the nervous system, and particularly so for children if they are exposed to the electromagnetic radiation from cell phones. In children the skull is a thinner protective barrier and the developing brain appears more susceptible to electrostress.

A postulated mechanism of the epidemic increase in Autism (in the US in the last 30 years increased from about 1 in 5000 to 1 in 65 children) is a twofold process. The first is an increase in exposure to heavy metals from immunizations and the environment. The second is the nerve membranes being stunned, thereby making cellular pores smaller trapping the metals inside. A program that puts children in a natural environment free of electrostress and provides nutrients that pull out metals has reported promising results. The clinic has observed that at first smaller metals and then larger and still yet larger ones are eliminated. Once the particularly large toxic metals such as mercury and lead are excreted, the children have been observed to get better. While awaiting further validation, minimizing exposure to electrostress and toxic heavy metals appears to be prudent.

Liver Spa™ and MethusaLife™ together can offer a dual benefit. Liver Spa™ can assist in restoring



membrane fluidity while the MethusaLife™ supports recovery of membrane polarity and potential. Reducing electrostress such as using the speaker phone or headset of a mobile phone, and testing and properly shielding homes and workplaces is also quite important. These formulas could appropriately be offered for children to support their optimum brain health and development. And for adults, brain fog due to electrosmog may be refreshingly lifted.

Alcohol

While part of our social customs, alcohol is the most widely and willingly ingested substance that can readily have toxic effects. These are most rapid and marked for the brain and liver and can also impair blood formation, the immune system, the heart and other tissues in various ways. The liver has a fixed amount of alcohol it can process every hour above which adverse effects increase in step with the amount consumed.

The liver is sensitive to the effects of many toxins, though alcohol is the most common. The presence of other toxins lowers the threshold at which alcohol will produce liver injury. The earliest major adverse effect is disturbed metabolism of fat resulting in accumulation of fat. If this progresses, the liver can become grossly enlarged and engorged with fat. If active damage occurs enzymes leak out of liver cells. At this point the condition has progressed to fatty hepatitis. This is a serious medical condition and can have up to 10 percent mortality.

As little as chronic consumption of 2 drinks per day can cause fatty hepatitis and an enlarged liver. If the ingestion and inflammation continue, progressive liver injury can occur with the end stage being a scarred shrunken failing liver. At this point, the prognosis for prolonged survival without a

liver transplant is very poor and quality of life is severely impaired.

Controlled Clinical Trial of Liver Spa™ to Support Normal Fat Metabolism

To assess the potential of Liver Spa™ to support liver health a controlled clinical trial was done. Conducted at Izhevsk medical research and training facility in Russia, the protocol was reviewed and approved by the Institutional Review Board to meet standards of safety and scientific merit.

All of the subjects had ultrasound proven fatty liver and blood chemistry proven liver inflammation. 25 subjects were in the treated group and 15 were in the untreated control group.

The amount of the formula used was 2 capsules of Liver Spa™ twice a day. Both groups were instructed to abstain from alcohol and other liver toxins.

After 30 days the results were remarkable and statistically significant with complete resolution of elevated liver enzymes in the treated group, with all values reduced to normal or low normal. While there was significant improvement in the control group, a degree of liver enzyme elevation remained. Total bilirubin (the yellow liver product that causes jaundice or yellowing of the eyes when elevated) reduced by 55 percent from significant elevation to essentially normal in the treated group, while this value declined by only 33 percent and remained somewhat elevated in the control group.

In the treated group, other statistically significant benefits were observed. These included post treatment ultrasound imaging showing complete resolution of fatty liver in 60 percent. Liver enlargement was reduced from 76 percent to 26 percent of the treated subjects. Nausea and GI upset were reduced from 80 percent to 20 percent, itching of the skin from 68 percent to 24 percent, and jaundice of the eyes from 93 percent to 16 percent.

The conclusion of the study group was that the formula supported the healthy structure and function of the liver. In addition, there were no adverse effects associated with the use of the formula.

Cell Membrane Fluidity

The health and vitality of the entire body reflects a composite of its approximately 100 trillion cells. Each cell is a living entity in itself that with other cells organizes in cooperative ways to generate tissues and organs and the body as a whole. The protective coating around each cell, the so-called cell membrane, is a double layer of uniquely constructed fatty molecules that packages the contents of the cell.

The membrane separates the inside from the outside of the cells and is vital to maintain the healthy balance of the internal versus external compartments. The membrane also is the home to special protein channels that maintain electrolytes, water and internal chemistry at the levels needed to sustain life. In addition, the membrane has specialized receptor proteins that respond to signals for that

cell, and a fluidly moving membrane is often needed for such information systems to work properly.

Such factors are especially important for the brain, which has a high fat content. Electrically active nerve cells often have additional fatty insulation around them called myelin that allows them to conduct electrical impulses more quickly and efficiently. High fluidity of nerve cell membranes is especially important for their complex system of receptors and neurotransmitters (brain chemicals that activate nerves in precise functional ways) to work well. Ideal balances of lipids and their function make for better brain power. As one Harvard researcher proclaimed, having the best versus worst fats in the diet could result in “a thousand fold difference in the efficiency of neurotransmitter function.”

The lipotropic factors in Liver Spa™ are well known to increase the fluidity of cell membranes. Indeed, choline and inositol are often integral components of the membrane molecular system and assist in its repair and maintenance.

In a healthy cell membrane the molecules are in dynamic motion and switch positions 10 million times per second! This allows a molecule on one side of the cell to get to the other side in about 20 seconds.

High membrane fluidity is essential for:

- 1. Optimal brain function**
- 2. Efficient cellular detoxification**
- 3. Cellular regeneration**

Other Possible Actions

Cellulite, lumpy fatty deposits particularly on the thighs and buttocks, are felt to be the body’s way of walling off toxins stored in fat. As the toxins are cleared from the cells, the fat can loosen and facilitate the lumps being smoothed out.

In addition, the nutrients in Liver Spa™ may:

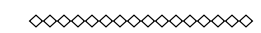
- 1. Increase learning and enhance memory**
- 2. Support the healthy structure and function of nerves**
- 3. Improve the beauty and quality of hair, skin and nails**

Periodic “spring cleaning” or consistent cleansing in a more toxic environment is one of the most powerful ways to support your cells to turn back the clock. Cellular detox can allow all your other anti-aging activities to work much better. Unless and until you clear out your cells and have high fluidity of your cell membranes, you may not know how just how great you can feel and how well you can function.

Reference:

http://balancedconcepts.net/liver_phases_detox_paths.pdf

CHAPTER 8



NITRIC OXIDE STRENGTHENS BODY AND MIND

A unique and vitally important system in the body is the production of a gas called nitric oxide. Any complete system of longevity must include this in its framework or it will not be as powerful as possible. The effects of this short-lived gas are so astonishing, the Nobel Prize in Medicine was awarded for the research that identified its mode of action. Different forms and flavors of nitric oxide processes occur in essentially all tissues from head to toe. As one researcher in this area has stated about this extraordinary molecule, “it does everything everywhere³⁹.”

The source of nitric oxide is the amino acid arginine. A series of enzymes called nitric oxide synthases produce nitric oxide in ways most suited to a particular purpose or tissue.

Qi laser activated arginine has been especially well studied. Using X-ray crystallography, the individual molecules are seen to be elongated in a consistent way after being crystallized under the influence of the laser. This confers an ideal shape to the arginine molecule to function efficiently with the nitric oxide synthase enzyme system and produce more nitric oxide for a given amount of arginine.

In vitro (test tube) studies of Qi laser activated arginine versus control arginine showed that the treated arginine produced statistically significantly more nitric oxide milligram for milligram when given to immune cells in culture. This indicated that the activated arginine was more potent for its

39 Fried R, Merrell WC, and Thornton J. The Arginine Solution: The First Guide to America's New Cardio-Enhancing Supplement. New York. Grand Central Publishing, 1999.

intended purpose. The total overall enhancement of immune system function was as high as 350 – 400 percent with the Qi laser enhanced arginine.

As described in “The Arginine Solution”, it is extraordinary how many systems of the body require nitric oxide in specific ways. Most remarkable is that nitric oxide is a gas that persists for only 5–10 seconds after it has formed. This means that a constant supply of arginine is needed so that nitric oxide can be continually produced for its many important actions that include the following:

Cardiovascular

From moment to moment, arginine derived nitric oxide dilates blood vessels and increases blood and oxygen supply to the cells of the body. Blood vessel dilation lowers vascular resistance and tends to lower blood pressure. In a pilot study of 40 persons taking Qi laser activated arginine blood pressure was reduced an average of 7 points systolic. Lower blood pressure even within the normal range has been found to have a protective effect for vascular disease. In the 10 persons who had elevated blood pressure, 90 percent showed a blood pressure lowering effect that was on average a 20 point decrease. In the persons with low normal blood pressure, there was not a further lowering effect.

The effects on the heart are especially strong. Arginine can dilate the arteries supplying the heart, giving it more blood flow. Thus giving arginine has been associated with improved exercise performance.

Arginine has favorable effects on cholesterol, and may even reduce cholesterol levels. Even more important arginine derived nitric oxide can prevent the oxidation of LDL cholesterol. Studies have shown that the presence of oxidized cholesterol rather than cholesterol level per se is the factor most associated with vascular inflammation and injury.

The putative mechanism of atherosclerosis is oxidized cholesterol in blood vessel walls attracting immune cells into the walls to eat the cholesterol. The big eaters that do this are called macrophages, literally from “macro” meaning large and “phage” meaning to eat. Macrophages that ingest a lot of cholesterol get so engorged they take on a stuffed foamy appearance from all the cholesterol within them. Foamy macrophages are felt to release the inflammatory chemicals that cause blood vessel injury and narrowing. One of the interesting effects of arginine is the ability to reduce the tendency of foamy macrophages to harm blood vessel walls. The use of arginine has even been associated with reversal of already formed vascular narrowing.

Lungs

Arginine-derived nitric oxide dilates the bronchial tubes of the lungs so that more air can move in and out of the lungs. This can increase the oxygen going in and the carbon dioxide

going out. This effect is related to the amount of arginine ingested, with greater arginine intake associated with greater bronchial tube dilation.

The presence of arginine derived nitric oxide increases the efficiency of hemoglobin’s ability to deliver oxygen to all the cells. This is both at the level of loading oxygen in the lungs and in unloading it when it gets to the tissues.

Gastrointestinal

Arginine assists the liver to detoxify ammonia. Arginine-derived nitric oxide stimulates smooth muscle contraction in the intestines to move food through for digestion.

Skeletal

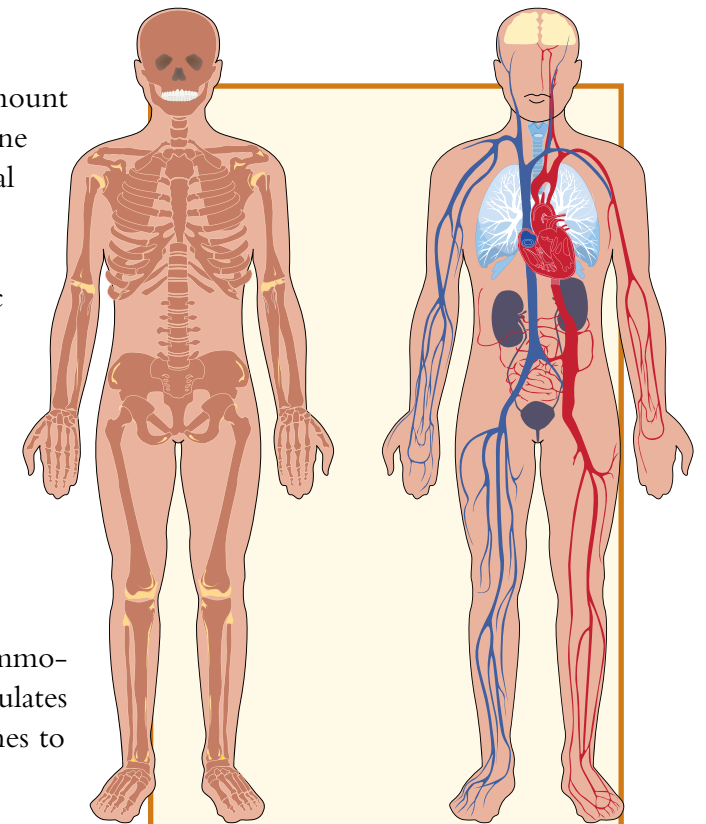
Arginine creates a series of effects that can serve to strengthen bone. For persons at risk for bones that are too soft, arginine can support healthy bone density and strength.

Muscular











Arginine has the effect of stimulating the release of growth hormone from the pituitary gland in the brain. Exercise can further increase this effect, resulting in greater muscle building from exercise.

Brain

Profound effects occur in the brain. When nerves become active to form memories, billowing clouds of nitric oxide gas issue from the nerves. The effect of nitric oxide is to maintain the stimulation of the nerve complex in a process called long term potentiation, or LTP. This is much like an etch-a sketch, a toy for drawing that makes the line darker if you



NITROXX® Strengthens and supports 10 major systems of the body

-  **Cardiovascular System**
-  **Lungs**
-  **Gastrointestinal**
-  **Skeletal System**
-  **Muscular System**
-  **Brain**
-  **Immune System**
-  **Sexual Function**
-  **Hormonal System**
-  **Blood Vessels**

Support for blood pressure, memory function and metabolic pathways too.

draw back and forth over the line. A similar process occurs in nerves. Enough arginine to support long term potentiation is essential for the formation of long term memories.

Immune System

Immune cells have a special form of the enzyme that forms jets of nitric oxide gas. These are so powerful they are likened to “bullets” of nitric oxide gas that directly clear pathological organisms.

Arginine also strengthens a part of the immune system called the natural killer system. These are the types of immune surveillance cells that are on the lookout for cancer cells to eliminate them before they can grow to create a problem.

Sexual Function

The effects of arginine-derived nitric oxide include the vascular dilation that supports erectile function. Giving arginine activates a similar pathway as Viagra® and does so far more safely; hence arginine has been called natural Viagra®.

In both men and women, arginine can increase genital sensitivity and responsiveness. In women this may also include enhanced vaginal lubrication with stimulation.

Male fertility may be favorably affected. Arginine has been shown to increase sperm counts and function.

Hormonal

The stimulated release of growth hormone goes beyond building muscle to the potential of general anti-aging effects. Growth hormone is a general rejuvenator and can also burn fat, improve skin, support growing hair and generally turn back the clock. Growth hormone is also an antioxidant hormone that tends to strengthen the anti-aging effects of nutrients that repair DNA.

The Nitroxx® Formula

To create a complete formula, cofactors have been added to arginine to support its biological action. These include the minerals magnesium for supporting healthy blood pressure and assisting in energy generation, zinc to strengthen immune function, and selenium with anti-tumor and antioxidant effects. In addition, B vitamins such as niacin (B3) and pyridoxine (B6) further support the metabolic pathways. These ingredients have been combined and Qi laser activated in a formula called Nitroxx.

A Published Study of Qi Laser Activated Arginine Supporting Healthy Blood Vessels

A controlled clinical study has been performed and published with respect to the activated arginine formulation⁴⁰. All of the subjects had suffered one or more major heart attacks and also had chest pain with exertion or at rest or both.

The subjects were 20 men between the ages of 46-74. While all were male similar physiologic effects would be anticipated for women. All had baseline electrocardiographic and exercise testing.

Symptoms were scored for chest pain with exertion or rest. In addition, the condition of erectile function and the presence or absence of chest pain during sex was also assessed.

All subjects were on medication as prescribed by their physicians. The arginine was added as an additional support for the healthy structure and function of the blood vessels.

The design was that for the first 30 days all persons were in the untreated control group. The next 30 days all persons got the active treatment which was 1.5 grams of the activated arginine plus cofactors twice a day.

Results were especially powerful separating the results from the 2 groups as shown in this table. The ★ symbol refers to a change that is statistically significant at p <.05.

Feature	Untreated Control Group	Treated Group
Chest pain with exertion	No change	80 percent reduced ★
Chest pain at rest	No change	70 percent reduced ★
Headache	No change	100 percent resolved ★
Shortness of breath	No change	Significantly better ★
Chest pain during sex	No change	75 percent resolved ★
Maximum exercise capacity	11 percent reduced	65 percent increased ★

For this study, the active treatment was associated with very significant improvement in cardiac per-

40 Ovokaitys TF, Fedorov VC. Report of a Clinical Study Using the Amino Acid Complex Nitroxx for the Reversal of Ischemic Heart Disease. Russian Medical Journal. 2011; 19(14): 110-112.

walking. In contrast frequent heavy exercise showed a point above which there appeared to be an adverse effect upon survival and longevity.

Anaerobic Exercise:

This type of exercise is generally of short duration and high intensity with the intention of building muscle. Few things do more for supporting long term high levels of function than building muscle. Muscle mass is a biomarker for physiologic age, and greater muscle is an indicator of being physiologically younger than if muscle has reduced.

Many people find it difficult to find the time to go to a gym, or find and use the equipment for this kind of exercise. Also, there is a common misconception that it requires 3-4 workouts per week to be effective.

Overtraining is perhaps the most common reason for people to leave an exercise program. Training too often can result in injuries that cause lapses of training and reduce results.

Any person not already educated in weight lifting or body building methods will be wise to invest in personal training. This will allow instruction in the proper use of equipment as well as outline a program well suited to the individual.

Perhaps the most user-friendly system is one that can make you stronger faster doing one 20 - 30 minute workout per week than doing longer workouts 3-4 times per week. It also promises easier long term maintenance with much reduced risk of injury. This program is called "The Power of 10" by Adam Zickerman and can be readily purchased from Amazon or elsewhere. The basic concept is performing slow lifts 10 seconds up and 10 seconds down at a weight levels that exhausts the muscle after 5-8 repetitions. This provides a maximum growth stimulus to the muscle so it can build faster. One week of rest is the advised so the muscle has sufficient time to build and recover before the next workout. The author reviews the data that training with this method will build more muscle after a few to several months of training than 3-4 longer workouts per week. And for long term maintenance, almost everyone can find 20-30 minutes in a week to build and maintain their strength. For those who do not have ready access to the gym, the author has also provided exercises that require no specialized equipment at all and can be done at home.

Nucleic Acids and DNA Methylation:

MethusaLife™ is designed to offer the specific benefits of delivering nucleic acids so that the body has a greater supply of these critical building blocks to regenerate cells and rebuild tissue in the body. Even a small relative deficiency of these vital components can prevent the body from optimum repair and maintenance of tissues. Combining this formula with 30 minutes of brisk walking, as reviewed, can markedly turn back the chemical aging clock while reducing weight, building muscle mass and increasing aerobic cardiovascular capacity.

DNA methylation is one of the two vital clocks that mark aging in DNA. Both of these clocks can be slowed, stopped and even reversed. The core of any program to become younger is to support the rejuvenation process from the DNA outward.

The reduction of homocysteine is a marker that parallels the ability to restore DNA methylation to useful levels. In general the optimum target is a homocysteine level of 7 or less. MethusaLife™ was successful at significant reduction of homocysteine at the basic level used. The intake of MethusaLife™ can be increased to get an even greater homocysteine lowering effect while also increasing the supply of nucleic acids. In some cases, more targeted and intensive homocysteine lowering nutrients may need to be given to get reduction into an optimum range for longevity.

Nutrition and Diet:

This is a topic of much debate and many books. In general, degrees of overweight and obesity are associated with many adverse health effects, including hypertension, cardiovascular disease and diabetes and their many complications. Each of these conditions, individually and collectively, may cause serious adverse events that can catastrophically impair quality of life and reduce longevity.

As in any situation in which there are or could be significant medical conditions, personal guidance with a qualified health practitioner is recommended. The usual goal is to bring a person to their ideal body weight which can often reverse conditions such as diabetes, so that adjustments of a medical regimen are needed to keep an appropriate balance of treatments.

For persons without known medical conditions, it is advised to bring or maintain body weight into the ideal range. This may delay or prevent many health issues from occurring, increase longevity, and strongly improve wellness and life quality.

To assess your current status you can calculate your body mass index, or BMI. The calculation is your weight in kilograms, or Kg (if your scale is pounds you can divide your weight by 2.2 to get your value in Kg), divided by your height in meters, or m (if your measure is inches you can convert to meters by multiplying by .0254), times itself once. The formula reads $BMI = Kg / m^2 = Kg / m \times m$. For example, a person weighing 110 pounds when divided by 2.2 also weighs 50 Kg. If this person is 59 inches (or 4 feet, 11 inches) they will have a height when multiplied by .0254 of 1.50 meters. This persons BMI = $50 / 1.5 \times 1.5 = 22.2$. This is in the ideal weight range of BMI of 18-24. For greater ease you can simply chart your height and weight on the body mass chart provided.

The interpretation of BMI results are as follows:

<18: Underweight/undernourished

18-24: Ideal range

25-29: Overweight

30-39: Obese

40 or more: Morbidly obese

BODY MASS INDEX CHART

WEIGHT lbs	100	105	110	115	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	
kg	45.5	47.7	50.0	52.3	54.5	56.8	59.1	61.4	63.6	65.9	68.2	70.5	72.7	75.0	77.3	79.5	81.8	84.1	86.4	88.6	90.9	93.2	95.5	97.7	
HEIGHT in/cm																									
5'0"	152.4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
5'1"	154.9	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	33	34	35	36	37	38	39	40
5'2"	157.4	18	19	20	21	22	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	36	37	38	39
5'3"	160.0	17	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	32	32	33	34	35	36	37	38
5'4"	162.5	17	18	18	19	20	21	22	23	24	24	25	26	27	28	29	30	31	31	32	33	34	35	36	37
5'5"	165.1	16	17	18	19	20	20	21	22	23	24	25	26	27	28	29	30	30	31	32	33	34	35	35	
5'6"	167.6	16	17	17	18	19	20	21	21	22	23	24	25	25	26	27	28	29	29	30	31	32	33	34	34
5'7"	170.1	15	16	17	18	18	19	20	21	22	22	23	24	25	25	26	27	28	29	29	30	31	32	33	33
5'8"	172.7	15	16	16	17	18	19	19	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	32	32
5'9"	175.2	14	15	16	17	17	18	19	20	20	21	22	22	23	24	25	25	26	27	28	28	29	30	31	31
5'10"	177.8	14	15	15	16	17	18	18	19	20	21	21	22	23	23	24	25	25	26	27	28	28	29	30	30
5'11"	180.3	14	14	15	16	16	17	18	18	19	20	21	21	22	23	23	24	25	25	26	27	28	28	29	30
6'0"	182.8	13	14	14	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28	29
6'1"	185.4	13	13	14	15	15	16	17	17	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27	28
6'2"	187.9	12	13	14	14	15	16	16	17	18	18	19	19	20	21	21	22	23	23	24	25	25	26	27	27
6'3"	190.5	12	13	13	14	15	15	16	16	17	18	18	19	20	20	21	21	22	23	23	24	25	25	26	26
6'4"	193.0	12	12	13	14	14	15	15	16	17	17	18	18	19	20	20	21	22	22	23	23	24	25	25	26

Underweight
Healthy
Overweight
Obese
Extremely Obese

Without commenting on the wealth of opinions, books and courses about weight loss, a few principles tend to be consistent in these programs.

Protein –

The focus is on lean proteins though even proteins with more fat are usually not a problem unless combined with an excess of dietary carbohydrate. If someone only ate protein it is unlikely they would be or would stay overweight, though with some conditions this could be taxing to the liver or kidneys. Vegetable proteins are also fine if they are combined to give a complete spectrum of the amino acid protein building blocks, so called complementary proteins such as results from combining corn and beans, and if such ingestion does intake an excess of carbohydrate.

Nonstarchy Vegetables –

The mainstay of an effective weight reduction or maintenance program is combining protein with low starch vegetables such as broccoli, cauliflower, brussel sprouts, radishes, onions, zucchini, and salad greens. Such vegetables are also usually rich in phytonutrient antioxidants that may have additional benefits such as anti-cancer sulfur compounds found in broccoli and cauliflower.

Healthy Oils –

For flavoring, dressings, and cooking monounsaturated oils such as extra virgin olive oil are excellent. Coconut oil is rich in medium chain triglycerides that can increase metabolic rate and support weight loss. Butter is fine to consume in moderation as long as you are physically active; its short chains are readily used for fuel for working muscle.

Carbohydrate –

The key to most successful weight reduction and maintenance is the moderating of carbohydrate intake. Perhaps the most hazardous carbohydrate in the modern diet is high fructose corn syrup. While safe in smaller amounts and as ingested in fruit, at high concentrations this sugar promotes weight gain and can produce an inflammatory effect in the liver. Other simple sugars such as sucrose are best ingested at low to at most moderate levels. Simple sugars enter the blood quickly, raise insulin levels, and promote weight gain, high blood lipids, and elevation of blood pressure if consumed in excess. Even starches have a cumulative effect on insulin activity if consumed above a given person's threshold. During active weight loss it is ideal to avoid simple refined sugars as much as possible and greatly reduce starches as well, typically to 20-40 grams total per day. When the weight target is reached, each person will have a carbohydrate threshold above which they will tend to regain weight. The more a person engages in aerobic activity, the higher this threshold will be. Especially efficient for weight control and maintenance is building muscle. Each additional pound of muscle (.45 Kg) will burn 75 calories per day, allowing greater caloric intake while maintaining weight.

Alcohol –

At 7 calories per gram, its caloric density and metabolic action is intermediate between carbohydrate and fat. Each gram of alcohol can be considered to be equal to one gram of carbohydrate plus half a gram of fat. Alcohol is best avoided during times of active weight loss, and used in moderation during periods of weight maintenance.

Artificial Sweeteners –

It is especially advised to avoid NutraSweet® (also called aspartame), as it can be metabolized to formic acid, which is a potent neurotoxin. Methanol ingestion is toxic and can cause brain injury and blindness through its conversion to formic acid. In addition, while low in calories, NutraSweet may also stimulate sugar cravings and appetite. While other artificial sweeteners appear to be less hazardous, longer term study will be needed to assess this fully. Natural sweeteners such as those derived from stevia or other plants are best and safest.

Caloric Intake –

As caloric restriction has been shown to increase life span from roundworms to mice, consuming fewer calories has a strong rationale to support living younger and longer. In general, programs that focus on high quality protein, nonstarchy vegetables and reduced carbohydrate intake are lower in caloric intake than other dietary programs.

Detoxification

Enhancing longevity and wellness also involves reducing and minimizing the effects of toxins in the environment. These include insecticides and pesticides, heavy metals, and a wide range of industrial and internal metabolic by-products.

Certain toxins are soluble in fat and poorly soluble in water. Insecticides, pesticides, and other organic toxins can fall into this category. This property will cause them to tend to go to and get stored in body fat. This can result in both persistence and progressive accumulation of such toxins. The greater the level, complexity, and toxicity of such chemicals the greater the problem they can be for the body.

Detoxifying fat is promoted by nutrients known as lipotropic. This means they naturally go to fat and assist in its metabolism and cleansing. Liver Spa™ has multiple strongly-lipotropic components that go to the liver to support clearing fat. These nutrients also increase cell membrane fluidity; this is important not only to promote cell regeneration, but also make it easier to transport stabilized or inactivated toxins out of the cells.

Methionine in Liver Spa™ also supports the formation of cysteine and glutathione, providing a tableau of detoxifying antioxidant sulfur compounds. Additional detoxifying sulfur compounds are present in cruciferous vegetables, onions, leeks, and garlic.

These organic sulfur compounds are also highly active for binding and clearing heavy metals such as mercury. Such sulfur compounds facilitate binding toxic heavy metals to inactivate them and aid in their elimination, with cilantro especially notable to assist with removing metals from the brain. Detoxifying heavy metals is particularly important to maintain the function of many important proteins in the body, especially vital to the healthy function of the nervous system and kidneys.

Cardiovascular Health

Central to any wellness and longevity program is the condition of the heart and blood vessels. Proper exercise and achieving ideal body weight are major factors shown to assist in maintaining or improving cardiovascular status.

Perhaps the single most powerful nutrient to strengthen the heart and blood vessels is the amino acid arginine. This is the primary source of nitric oxide that has multiple interactive benefits that include:

- Lowering and stabilizing blood pressure
- Reduced cholesterol levels
- Preventing oxidation of LDL cholesterol
- Reducing the potentially harmful action of macrophages in blood vessel walls
- Opening narrowed blood vessels

- Dilating coronary arteries for increased blood flow to the heart
- Improving the action of hemoglobin to bind and transport oxygen to tissues
- Generally better blood flow and function in genital region
- Increased blood flow throughout all body tissues
- Enhanced exercise performance and recovery

The Nitroxx™ formula provides Qi laser activated arginine in a form that can be rapidly absorbed and used. It contains selenium, magnesium, and zinc which together enhance energy production, and support a healthy nervous system and strengthens the reproductive organs and immune system.

L-arginine is one of the most potent growth hormone releasing amino acids. This can significantly increase the amount of growth hormone produced and released by the pituitary gland naturally, which is far safer than injections of the hormone itself. Growth hormone is a powerful rejuvenator from head to toe, and acts to build muscle, burn fat, make skin and hair younger, and generally turn back the aging process through many organ systems.

Elongating Telomeres:

The ends of the chromosomes are known as telomeres, and their length represents the second of two DNA aging clocks. At birth, their length is about 10,000 base pairs long and sets the starting point of the clock. Each time cells divide, a little bit of the telomeres tends to chip off the ends. The telomeres guide the movement of chromosomes during cell division, and prevent chromosome disruption as cells divide. When the telomeres shorten to about half their original length, cells stop dividing which halts cell regeneration and sets a limit to human life span.

Some lines of evidence suggest that the single step of keeping telomeres long in healthy cells could increase the human life span significantly, possibly indefinitely. Thus sustaining the telomeres to the greatest length possible keeps cells and tissues more robust and favors youthful longevity. Elongating telomeres is tantamount to turning back the aging clock at the cellular level.

One of the most important steps to maintaining longer telomeres is efficient methylation chemistry. Elevation of homocysteine has been shown to accelerate shortening of the telomeres in the cells that line blood vessels. Strong methylation chemistry as provided in MethusaLife™ assists with keeping both the telomere length and DNA methylation aging clocks as youthful as possible.

Products targeted at telomere length have tended to be very expensive and long term data is awaited to assess safety and effectiveness. In contrast there are 2 safe, simple, cost effective strategies almost everyone can use, which are:

Omega-3 Essential Fatty Acids (EFA's):

Vitally important to health is this class of fats that the body does not make on its own and have to

be consumed in the diet. Omega-3 EFA's can have short chains such as the forms found in flax or hemp oil, or long chains such as those found in cold water fish like salmon. These oils are another factor that enhances the fluidity of cell membranes, necessary for cellular detox and rejuvenation.

The most powerful of all the omega-3 EFA's are the very long chain omegas known as EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). EPA has 5 double bonds and EPA has 6 double bonds in its structure. The more double bonds, the higher the melting point and the higher the fluidity this will impart to cell membranes. EPA and DHA are the kings of making cell membranes more fluid. EPA also has properties that may favorably modulate the inflammatory process. It is used in producing very powerful hormones called eicosanoids that regulate local processes in the body at very small concentrations.

DHA is especially important for the brain. In a healthy brain up to half of the lipid content is DHA. This allows cell membranes to be more fluid and is vital for the receptors of the brain to work properly. Giving DHA to premature infants has been shown to increase IQ by 10 points compared to not providing adequate levels. At any age, DHA can increase the efficiency of the brain and improve cell membrane functions from head to toe.

The usual ratio of EPA to DHA in a nutritional supplement is 3:2. At this ratio it is suggested to consume a minimum of 750 mg of EPA/ DHA to provide an adequate amount to support healthy brain function. Providing higher levels than this have proven to be beneficial for cardiovascular health, supporting the health of joints in rheumatoid arthritis and balancing manic depressive disorder in controlled clinical trials.

Of great interest and importance it has recently been shown that higher intakes of EPA/ DHA have had the benefit of elongating telomeres. At levels of 1200 – 2400 mg per day, the vital anti-aging effect of making telomeres longer was found. For this reason, and for all the other deep-seated benefits of EPA/ DHA, taking this amount of these nutrients is highly recommended.

Meditation

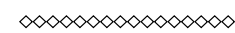
In addition to calming the mind, achieving centering and balance, and relieving stress, meditation has significant anti-aging properties. One study of meditators versus non-meditators found that after 10 years, the persons who did not meditate aged 10 years as expected; in contrast the meditators did not age, showing stable biomarkers. Thus meditation can support the ability to enter an ageless state.

These observations have been further confirmed by showing the extraordinary effect that meditation results in longer telomeres. In addition to all the other benefits, meditation can turn back the aging clock and make you younger.

Summary

This condensed series of recommendations offers tools that can be used to improve every aspect of personal health and vitality. It is suggested you draw upon these tools widely and wisely so you can live younger, longer, and happier.

APPENDIX



Additional Benefits of ATP: Based on peer reviewed published studies, additional potential effects from delivery of ATP include the following¹:

Athletic Performance

When muscles are exercised, ATP is required. It boosts aerobic performance and accelerates recovery from high intensity activity like lifting heavy weights or sprints. ATP can accelerate relieving the “burn” caused by the accumulation of lactic acid in the muscles.

Nervous System Effects

The brain, spinal cord, and nerves require a constant supply of ATP for their optimal function. It's also been shown that nerves carry a special receptor for ATP or its precursor adenosine. Supplementing ATP or adenosine has been shown to provide pain relief comparable to injected morphine for pain due to impaired blood flow, mediated via a class of nerve receptors known as purinergic.

Cardiac Strengthening

The cyclic contraction of the heart is very energy intensive and thrives in an ATP-producing aerobic environment. The ATP in MethusaLife provides the heart with an enhanced supply for efficient function. Delivery of ATP or its precursors tends to strengthen and stabilize cardiac electrical conduction and heart rhythm.

Lung Function Support

ATP has been shown to have numerous beneficial effects on lung function. It's especially

supportive of the tiny, delicate air sacs deep in the lung called alveoli. Only a single layer thick, the alveolar sacs provide a large membrane area for absorbing oxygen into the blood with every breath. On each breath out the alveolar sacs release carbon dioxide from the blood. The air sacs are prone to collapse on the exhale, which is prevented by a compound called surfactant that coats the air sacs and keeps them open for gas exchange. Studies have shown that ATP increases the secretion of surfactant.

ATP has an additional benefit for the lungs. The bronchial tubes that bring air into our alveoli are lined with little brush like structures called cilia that rhythmically sweep upward to cleanse the bronchial lining. ATP increases the beat frequency of the cilia, accelerating the cleansing process from the lungs. ATP also increases the secretion of mucus and water from the bronchial lining, further increasing the clearing activities of the lung. ATP, in addition supports maintaining healthy pressure in the blood vessels within the lungs.

Cellular Immunity Enhancement

Certain types of lymphocytes of the immune system are especially important for the elimination of tumor cells or cells infected with viruses. These specialized effector cells include natural killer cells and cytotoxic T cell lymphocytes, the activity of which appears to be enhanced ATP. In test tube studies, ATP increases the ability of cytotoxic lymphocytes to eliminate tumor cells.

Antitumor Effects

In test tube studies, ATP directly reduces the growth of several types of human tumor cells, including melanoma, myeloid and monocytic leukemias, and malignancies of the pancreas, prostate, colon and breast. In contrast, normal cells from these tissues showed little or no inhibition of growth with the addition of ATP. This suggests that increasing ATP levels outside of cells may have a selective inhibitory effect on several tumor cell lines.

Perhaps most dramatic, ATP may directly cause some types of tumor cells to burst. In test tube studies with human acute myeloid leukemia, dose-dependent elimination of the tumor cells was seen. The higher the amount of ATP given, the greater the proportion of the abnormal cells that were eliminated.

Muscle Support

With advanced malignancies, a severe wasting syndrome can be seen. While some treatments may support weight gain, this tends to be of fat and not of the desirable increased muscle mass and vital bodily proteins. A remarkable result was seen with high intensity intravenous ATP. In a randomized clinical trial, intravenous ATP was given to patients with advanced lung cancer at 2-4 week intervals. While patients in the control group lost 2 pounds per month, the group receiving ATP had stable-to-increased weight. Over 6 months, the control patients lost one third of their muscle strength, whereas those receiving ATP enjoyed stable muscle strength.

¹ Agteresch HJ, Dagnelie PC, van den Berg JWO, et al. Adenosine triphosphate: established and potential clinical applications. *Drugs*. 1999; 58 (2): 211-232.

Recovery From Shock

When tissues are deprived of blood flow and oxygen, rapid and massive depletion of ATP occurs within cells. Giving ATP has been described as a “natural defense system” to protect the tissues from the effects of severe oxygen deprivation. The effects include improved function of energy generating mitochondria, better electrolyte transport, increased ATP within cells, reduced oxygen consumption, and improved function of messenger molecules within the cells.

In a randomized controlled trial, 32 patients with either acute kidney failure or multiple organ failure due to shock were studied. Shock is a condition of generalized reduction of blood flow or oxygenation to tissues. The patients were randomly divided into a group that received intravenous ATP and a placebo control group. The control group had 73 percent survival, whereas the treated group had a significantly better 100 percent survival rate.

Sexual Function

Studies in human tissue show that ATP enhances the smooth muscle relaxation required for erectile function. The erectile tissue of diabetic men has been found to be especially responsive to the smooth muscle relaxation effects of ATP which may thus assist in strengthening the healthy structure and function of these tissues through a natural mechanism².

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2. Guer S, Oeztuerk B, Karahan ST. The roles of adenosine and adenosine 5'-triphosphate in the penile corpus cavernosum smooth muscle from nondiabetic and diabetic men. *Drug and Device Research*. 1998; 43: 63, abstract 242.

2 Guer S, Oeztuerk B, Karahan ST. The roles of adenosine and adenosine 5'-triphosphate in the penile corpus cavernosum smooth muscle from nondiabetic and diabetic men. *Drug and Device Research*. 1998; 43: 63, abstract 242.

Growing Younger

This book provides an investigation into the reversal of aging— with a special focus on the remarkable new MethusaLife™ formula. Dr. Todd Ovokaitys shares why this formula can be the foundation for an anti-aging revolution. A comprehensive plan is then offered that combines nutritional and lifestyle elements that can assist us to achieve our full biological potential.

About Dr. Todd Ovokaitys, M.D.

Dr. Todd Ovokaitys is a recognized figure in the biophysics community with a specialty in Anti-Aging Medicine. He has been a keynote speaker for the American Academy of Anti-Aging Medicine (A4M) on three occasions, with presentations domestically and internationally for several other organizations.

At Northwestern University, he was at the top of his class with the highest possible grade point average. After two years at Northwestern, he was one of 26 students in America accepted into an elite accelerated medical training program at Johns Hopkins University— where he received his undergraduate degree with Phi Beta Kappa honors. After receiving his Doctor of Medicine degree from Johns Hopkins Medical School, he trained at Georgetown University Hospital—completing a Residency in Internal Medicine followed by a Fellowship in Pulmonary and Intensive Care Medicine.



During his training, Dr. Todd developed a passion for the biophysics of biological, medicinal, and nutritional molecules. With the assistance of colleague John Scott Strachan, he developed and patented a laser technology that makes extremely rapid impulses fast enough to match the vibrations of molecules. Called the Quantum information (Qi) laser system, it can produce impulses faster than a millionth of a billionth of a second.

Applying this platform, Dr. Todd's research team created and patented the world's first new form of usable aspirin in over a century of research— with far more free energy, expected to greatly increase absorbability and effectiveness. An additional 20 new medicinal compositions have been developed and patented with a focus on improving cardiovascular therapeutics.

His team has also recently patented a protocol that rapidly regenerates heart muscle. Using amino acids, the building blocks of proteins, the function of these natural building blocks was activated with the Qi laser. Ingesting the activated amino acid formula increased heart function an average of 25% in just 30 days.

