

## Telomeres, Aging & Cancer

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### Overview

- Your Biological Age
- Nutrients
- Supplements
- Food
- Diet

Telomeres are bits of “junk DNA” at the end of chromosomes that protect your real DNA every time a cell divides. What happens is that, due to how cells divide, the very last bit of a chromosome can't be copied 100% - a little bit gets cut off. It was thought that, as cell divide, the telomeres get shorter each time until they are gone. At that point, the “real DNA” cannot be copied anymore and the cell simply ages and no longer replicates.

The human body is made up of 100 trillion cells. According to one theory, you age because your cells age, and therefore, if you can control the aging process in your cells, you can control the aging of your body. Each cell in your body contains a nucleus, which in turn contains the chromosomes that contain your genes. The chromosome is made up of two “arms”, each of which contains a single molecule DNA. This molecule is essentially a string of beads made up of units called bases, and there are about 100 million bases in each DNA molecule. At the tip of each chromosome lies the telomere, which many doctors believe is the key to altering the human aging process, as we know it. A telomere is about 15,000 bases long at the moment of conception in the womb, but immediately begins to shorten each time your cell divides. Once your telomeres have been reduced to approximately 5,000 bases, you essentially die of old age. So far, scientists have discovered that the telomere shortening process can be **accelerated** by unhealthy lifestyle choices such as lack of exercise, smoking, stress, and obesity.

Interestingly, **our reproductive cells do not age** (their telomeres do not shorten like all other cells in our bodies). This is due to an enzyme called telomerase. All of our cells have the ability to produce telomerase, but the gene for telomerase production is turned “off” in our non-reproductive cells. Scientists are now racing to find out how to how to turn on the gene that produces telomerase in these non-reproductive cells, as this would create the first true “anti-aging drug”. Even so, like any drug there could be side effects.

Lets use the sound scientific research we already have to fixing the Hepatic Glutathione Pathway to slow down the telomere shortening process by increasing our innate glutathione levels and following the protocol below.

### Telomere Shortening and Aging

In population level studies, researchers have shown that older people have shorter telomeres. Eventually, the cells with shorter telomeres can no longer replicate and, taken over time and lots of cells, tissue damage and the dreaded “signs of aging” can show up. Most cells can replicate about 50 times before the telomeres are too short. Some believe that telomeres are the “secret to longevity” and there are circumstances in which the telomeres will not shorten. Cancer cells, for example, don't die (which is the main problem) because they switch on an enzyme called telomerase, which adds to the telomeres when cells divide. Some cells in your body need to do this (stem cells and sperm cells, for example) because they need to replicate more than 50 times in your lifetime.

### Does It Happen to Everyone?

No. Researchers in Sweden found out that some people's telomeres do not necessarily get shorter over time. In fact, they found that some people's telomeres even get longer. This variation at the individual level was hidden by prior studies that averaged results over large population.

In the study, 959 individuals donated blood twice, 9 to 11 years apart. On average, the second samples had shorter telomeres than the first. However, around 33% of the people had either a stable or increasing telomere length over a period of around 10 years. What does this mean? Nobody knows. It could be that those people have an amazing cellular anti-aging mechanism or it could be that they have an early sign of cancer (researchers tried to rule this out) or it could be fairly meaningless. What we do know for sure is that aging is a lot more complicated than simply looking at the shortening of telomeres.

### Vitamin D3

The November, 2007 issue of the American Journal of Clinical Nutrition published an article describing the discovery of British and American researchers of an association between longer telomeres and increased levels of vitamin D. Telomeres are caps on the ends of chromosomes which have been found to shorten with age, as well as with increased oxidative stress and inflammation. The finding suggests that vitamin D may play a role in slowing the onset of age-related diseases.

Dr J. Brent Richards at King's College, London School of Medicine and colleagues studied 2,160 female twins aged 19 to 79 for the current research. Blood samples were analyzed for serum vitamin D levels, C-reactive protein (CRP, a marker of inflammation) and additional factors, and telomere length was measured in the DNA of peripheral white blood cells (leukocytes).

As expected, older participants had shorter telomeres; however, leukocyte telomere length (LTL) was greater among subjects whose levels of vitamin D were high compared to those with low concentrations, a finding which persisted after adjustment for age and other factors. Participants in the top one-third of serum vitamin D levels had telomeres that averaged 107 base pairs longer than those in the lowest third, equivalent to a five-year difference in chronologic aging.

Telomere length was also greater in those with lower C-reactive protein levels than in subjects with higher concentrations. When participants who had the highest CRP and lowest vitamin D concentrations were compared with those who had the lowest CRP and highest vitamin D levels, the difference in telomere length was equivalent to 7.6 years of aging.

In a subset analysis of vitamin D supplement users, those who supplemented were also found to have longer telomeres than those who did not supplement with the vitamin.

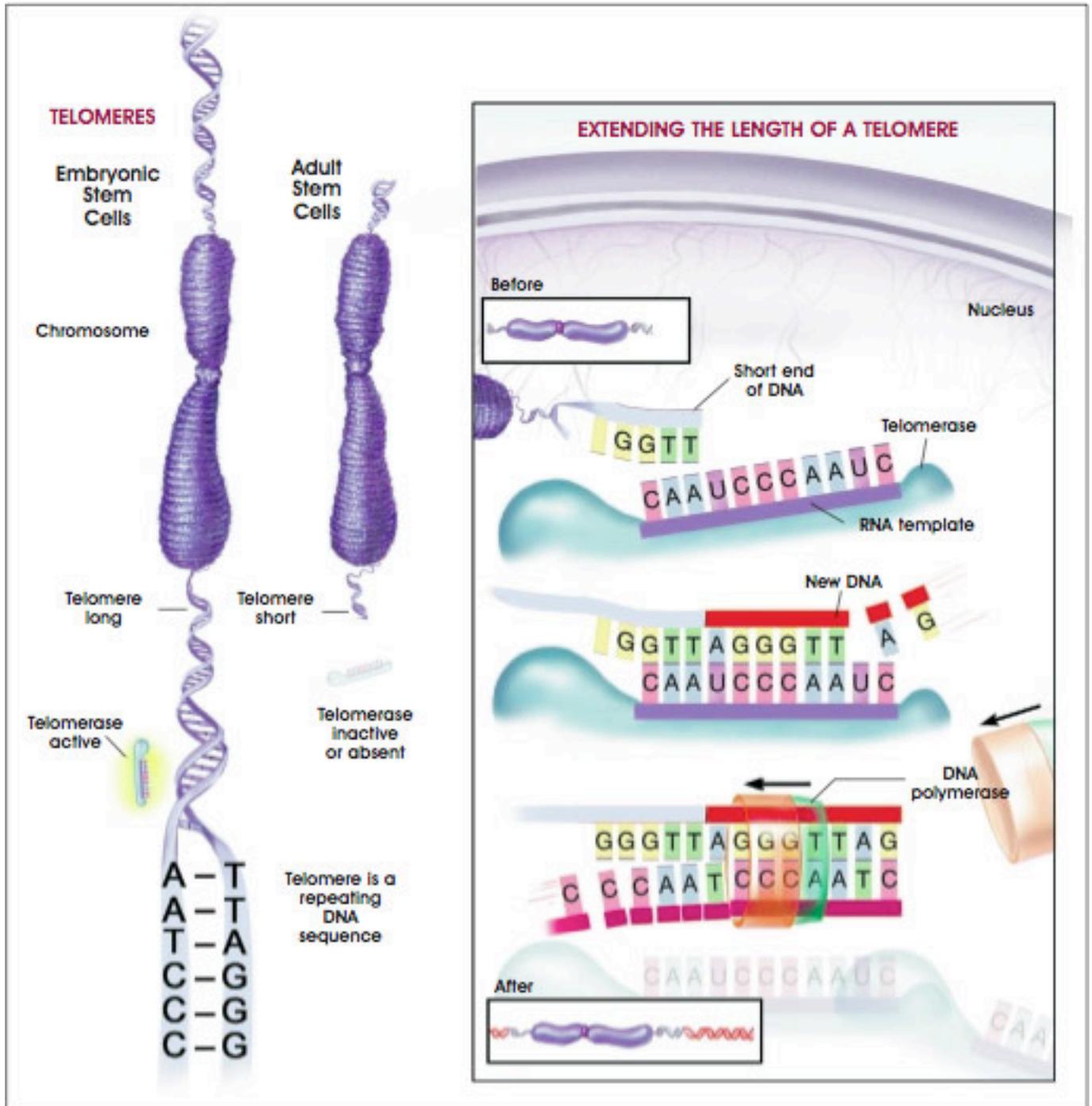
In their discussion concerning mechanisms of action, the authors note that inflammation and oxidative stress are key determinants in the biology of aging, and that vitamin D decreases mediators of systemic inflammation such as interleukin-2 and tumor necrosis factor-alpha. While habits that increase oxidative stress and inflammation may be difficult to change, they observe that vitamin D concentrations are easily modifiable through nutritional supplementation or sunshine exposure.

"Although both LTL and serum vitamin D concentrations decrease with age and are thus possible markers of aging in general, we have shown that the positive association between LTL and vitamin D concentrations is independent of age and many other covariates," the authors conclude. "Longitudinal studies or randomized controlled trials of supplementation exploring the effect of vitamin D on LTL will be necessary to unequivocally establish the relation between vitamin D and leukocyte telomere dynamics; but for the moment, our data suggest another potential benefit of vitamin D--on the aging process and age-related disease."

Vitamin D3 is a prehormone and benefits osteoporosis, hypertension, depression, multiple sclerosis, back pain, insulin resistance. Dr. Dale's Wellness Center makes a Vitamin D3 supplement in veggie caps (no mag stearate or any other fillers or binders).

## Glutathione ~ Fixing the Hepatic Glutathione Pathway!

Increase your body's stores of the antioxidant glutathione, or GSH. Glutathione is known to increase the integrity of telomeres. Telomeres are bundles of DNA found in every cell, and they shorten with age.



*Stem Cell Information, The National Institutes of Health resource for stem cell research, Appendix C: Human Embryonic Stem Cells and Human Embryonic Germ Cells, <http://stemcells.nih.gov/info/2001report/appendixC.asp>*

Researchers suspect telomeres shorten due to damage by free radicals. Free radicals play a role in DNA mutations, and there is evidence that mutations in your telomeres can cause larger chunks than normal to be lost during cell division.

Low levels of GSH are always found in people with oxidative stress-related diseases like cancer and AIDS. Further, as glutathione levels drop, these patients get sicker.

The key is to correct the Hepatic Glutathione Pathway so that the body produces its own glutathione as it designed to do. Using a glutathione supplement is costly and ineffective to correct the pathway. It just won't do it and you will have to take the supplement for years. A significantly better outcome to anti-aging is to reduce the biological age; returning the body to a much more youthful state by correcting and healing the HGP pathway.

### **Reversing Aging ~Reducing the Biological Age!**

The model that I propose to start reversing the aging process and shortened telomeres continues below with a protocol for supplement and food choices. You need to know what to do and what not to do in order to help patients make the correct choices.

Our HGP formula not only corrects the pathway that produces glutathione but also corrects the body's methylation process and lowers homocysteine levels. After using the HGP formula your food choices are critical to continue this process.

I confirmed with some of the leading scientists there that you could actually increase your levels of GSH through dietary manipulation.

No Whey! I disagree when whey protein of any kind is recommended. Whey is a bovine dairy product and all dairy is an inflammatory product and can contain toxins, radiation, medication, pesticides and hormones.

The best way to increase and maintain your GSH levels is to make sure your diet includes foods rich in the sulfur amino acids your cells need to synthesize glutathione.

### **Protocol**

Vitamin D3

HGP Formula: contains the best glutathione along with the necessary nutrition to fix the pathway.

Raw Nattokinase

Slow Cleanse every 6 months

Optimal Multi: with strong adrenal support

Nano Ionic Minerals with Silica

BioAge Reverse to control Human Growth Hormone secretion and insulin, adrenal balance

Diet Below

Mercury Amalgam Replacement

Raw Organic Eggs are a super food. (free-range chicken eggs). Furthermore, research has ended the debate -- there is no link between egg consumption and heart disease.[\[1\]](#)

A single egg contains:

- Nine essential amino acids.
- Six grams of the highest quality protein you can put in your body. Proteins are nutrients that are essential to the building, maintenance and repair of your body tissues such as your skin, internal organs and muscles. They are also the major components of your immune system and hormones.
- Lutein and zeaxanthin (for your eyes).
- Choline for your brain, nervous- and cardiovascular systems.
- Naturally occurring vitamin D.

The best eggs are free-range chickens that eat a natural, nutrient-dense diet of seeds, green plants, insects and worms. I recommend you try to get your eggs locally. To find free-range pasture farmers in your area, ask at your health food store or visit [www.eatwild.com](http://www.eatwild.com) or [www.localharvest.com](http://www.localharvest.com).

In the store look for free-range organic. Avoid all omega-3 eggs, as they typically come from hens fed poor quality omega-3 fat sources that are already oxidized.

Cleaning your eggs to reduce or eliminate salmonella or other contamination is best done with Ozone. I use veggie wash equipment by Donsbach to ozonate vegetables and eggs.

- Eat your eggs raw whenever possible. Allergic reactions to eggs are generally caused by the changes that take place in the cooking process. Eating eggs raw also helps preserve many of the highly perishable nutrients they contain.
- Avoiding raw egg yolks is conventional nutritional dogma, as raw egg whites contain a glycoprotein called avidin that is very effective at binding biotin, one of the B vitamins. The concern is that this can lead to a biotin deficiency. You can cook the egg whites, as this completely deactivates the avidin. The problem is that this also impairs the structure of nearly every other protein in the egg. While you will still obtain nutritional benefits from consuming cooked eggs, from a nutritional perspective it would seem far better to consume them uncooked.

After all, there is plenty of biotin in the egg yolk. Egg yolks have one of the highest concentrations of biotin found in nature. So it is likely that you will not have a biotin deficiency if you consume the whole raw egg, yolk and white. Do Not consume raw egg whites, you are nearly guaranteed to develop a biotin deficiency unless you take a biotin supplement.

## Daily Greens

Like eggs, leafy greens such as spinach, kale, turnip greens, collard greens, and romaine lettuce, are great sources of lutein and zeaxanthin. Studies have shown eating foods rich in these antioxidants can significantly reduce your risk of AMD (age-related macular degeneration), as well as non-Hodgkin's lymphoma.

Best Leafy greens:

- Spinach and kale contain cancer-fighting antioxidants like beta-carotene, vitamin C, and sulforaphane.
- Spinach provides folate, which research shows can dramatically improve your short-term memory. Eating folate rich foods may lower your risk for heart disease and cancer by slowing down wear and tear on your DNA.
- Spinach has a very high ORAC score. ORAC stands for Oxygen Radical Absorbance Capacity, which is a measurement of a food's ability to destroy the free radicals that cause damage in your body. The higher the ORAC score, the better a food is for you.

## Eat Biophotons for your Health

Naturally grown fresh vegetables are also rich in sun-stored energy in the form of minute particles of light called biophotons. This light energy manifests as feeling healthy and vital.

Research shows that light energy (biophotons) is also a key factor in its quality. The more biophotons a food is able to store, the more nutritious it is. Studying in Germany and with Dr. Fritz Popp a great biophysicist who

researched and enabled the visibility of biophotons of cucumber seeds through a photo multiplier (which can magnify at a amazing distance of 5 kilometers i.e. you can see a firefly from 5 kilometers away)

Leafy greens like collard and some salad greens and spinach, contain vitamin K, which is linked to good vascular health[2], including fewer varicose veins.

Vitamin K, a fat-soluble vitamin, is also vital for:

- Blood clotting
- Strong bones
- Prevention of heart disease
- Prevention of Alzheimer's disease
- Regulation of your insulin and blood sugar levels
- Treatment of certain cancers, including lung and liver cancer.

The vitamin K in vegetables is vitamin K1. Fermented foods like natto and cheeses also have vitamin K2, which provides even more potent benefits for your bones and reduces the risk of calcification of your arteries.

Our Raw Nattokinase can be used with Coumadin to win the patient off or as a substitute and does not contain Vitamin K, which would make the blood too thin.

Research data indicates that conventional produce has only 83 percent of the nutrients of organic produce.

### **Broccoli and Isothiocyanates**

Broccoli is another dark green, antioxidant rich vegetable in the cruciferous family, with near miraculous powers of healing and disease prevention. Broccoli contains the highest amount of isothiocyanates, a cancer-fighting compound, of all the crunchy vegetables. Isothiocyanates work by turning on cancer-fighting genes and turning off others that feed the disease.

Other vegetables containing isothiocyanate include: brussel sprouts, cauliflower, cabbage, arugula, watercress, and horseradish. Research shows eating cruciferous vegetables can significantly reduce your risk of breast, bladder, lung and prostate cancer.

Studies have shown men who eat more than one portion of cruciferous vegetables a week are at lower risk of prostate cancer. One serving of broccoli is about two spears, so just 10 spears a week can make a difference in your health.

### **Blueberries**

Blueberries rank at the very top of the list of fresh fruits and vegetables because they contain high amounts of antioxidants, which help your body neutralize free radicals, molecules that can harm brain cells and brain function.

A study published by Tufts University showed that anthocyanin in blueberries, which is the pigment that give them their deep color, appear to combat oxidative stress.[3]  
Oxidative stress is one of the main causes of aging.

- Anthocyanins also aid your brain in the production of dopamine, a chemical that is critical to coordination, memory function, and your mood.
- Blueberries, especially grown wild, can give an enormous boost to your health. They can help:
  - Reduce your cancer risk
  - Reduce cholesterol levels

- Prevent heart disease and stroke
- Protect you from Alzheimer's and other neurological diseases
- Reverse short term memory loss **and prevent brain aging**
- Relieve symptoms of arthritis
- Fight infection and support your immune system
- Improve urinary tract health
- Improve your vision and the health of your eyes

Blueberries are low in sugar, but it's still best to eat them in moderation to keep your insulin levels from spiking.

The healing properties of other berries follow.

- Black raspberries are potent cancer fighters as well, with about three times the amount of antioxidants found in blueberries. These berries can be harder to find than other varieties because they're grown in smaller quantities. It's harder still to find them fresh, so you may need to look for them frozen.
- Cherries are rich in queritrin, a flavonoid, and ellagic acid. Both are potent anti-cancer agents.
- Strawberries contain phytonutrients, natural anti-inflammatory agents that also protect your heart and have cancer fighting properties.
- Blackberries contain antioxidants, ellagic acid, and vitamins C and E, all of which may reduce cancer risk and fight chronic disease.
- Cranberries are loaded with polyphenols, a powerful antioxidant. Studies show they may inhibit the growth of breast cancer cells and reduce the risk of stomach ulcers and gum disease.
- Acai berries, from Brazil, contain antioxidants with the power to destroy cultured human cancer cells. Amazingly, these berries triggered self-destruction of over 85 percent of leukemia cells tested.

## Garlic

The component of garlic, allicin, which causes the familiar strong smell and flavor, is actually an extremely effective antioxidant. As allicin digests in your body it produces sulfenic acid, a compound that reacts faster with dangerous free radicals than any other known compound. Garlic is also a triple threat against infections due to its antibacterial, antiviral and antifungal properties. It is effective at killing antibiotic-resistant bacteria, including MRSA, as well as fighting yeast infections, viruses and parasites.

Garlic helps relax and enlarge the [blood vessels](#) in your body, improving blood flow, especially to your heart.<sup>[4]</sup> This can help prevent conditions like high blood pressure and life-threatening events such as a heart attack or stroke. Garlic also inhibits the formation of plaques in your arteries, and prevents cholesterol from becoming oxidized, a condition that may contribute to heart disease.

Both garlic and onions can increase your protection against at least five forms of the deadliest types of cancer: breast, colon, ovarian, prostate and esophageal.

It also appears that allicin may be useful as a cancer treatment. When alliinase and alliin (the two components that covert to allicin) were injected into a tumor cell, the reaction not only penetrated the cell but also killed it. In addition to all those benefits, research also indicates garlic may be useful for controlling weight.

Garlic cloves must be crushed or chopped in order to stimulate the process that converts alliin into the beneficial allicin. Once the garlic is cut, the active compound loses potency rapidly and can disappear completely within about an hour of chopping.

The best way to eat garlic is to take a whole, fresh clove, chop it, smash it or press it, wait a few minutes for the conversion to occur, and then eat it. If you use jarred, powdered, or dried garlic, you won't get all the benefits fresh garlic has to offer.

It is important to know though that a number of people are allergic to garlic. If you are one of them you should definitely avoid garlic. Actually that is true for any food in this article. It might be the healthiest food in the world, but if your body gives you a signal to avoid it, then it is typically best to honor your body's wisdom.

## Chlorella

Chlorella, a single-celled fresh water algae plant, is often referred to as a near-perfect food.

Important Note about Chlorella! USE CHLORELLA ONLY AFTER MERCURY FILLINGS ARE REPLACED. It should not be consumed if you have existing mercury fillings in your mouth. Most people who advocate uses of chlorella have not had enough experience or researched that the chlorella itself will mobilize mercury from mercury fillings in your mouth; from fillings or mercury posts that are inserted in root canals.

Its range of health benefits is astounding and includes:

- Boosting your immune system
- Improving your digestion, especially if constipation is a problem
- Enhancing your ability to focus and concentrate
- Increasing your energy levels
- Balancing your body's pH
- Normalizing your blood sugar and blood pressure
- Reducing your cancer risk
- Even freshening your breath

Once the mercury burden is removed from your mouth, it will start releasing from the body using the Mercury Plus Detox and Lymph Detox.

## The Most Important Way to Slow Aging

Most people don't understand the importance of optimizing their insulin levels, as insulin is without a doubt THE major accelerant of aging. Fortunately, you can go a long way toward keeping your insulin levels healthy by reducing or eliminating grains and sugars from your diet.

This one crucial step, combined with nutritional typing and the inclusion of nature's anti-aging miracle foods in your diet, can dramatically improve your health and longevity.

It is also crucial to include a comprehensive exercise program, as that is another lifestyle choice that will radically improve the sensitivity of your insulin receptors and help to optimize your insulin levels.

[1] Harvard School of Public Health, The Nutrition Source, Fats and Cholesterol: Out with the Bad, In with the Good, <http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/fats-full-story/index.html>

[2] Journal of Vascular Research, Identification of Differentially Expressed Genes in Human Varicose Veins: Involvement of Matrix Gla Protein in Extracellular Matrix Remodeling, 7/20/07, <http://content.karger.com/ProdukteDB/produkte.asp?Aktion=ShowPDF&ArtikelNr=000106189&Ausgabe=233319&ProduktNr=224160&filename=000106189.pdf>

[3] Tufts University e-news, Researchers At Tufts University Report Blueberries May Reverse Memory Loss, <http://enews.tufts.edu/stories/101399BlueberriesMayImproveMemory.htm>

[4] Proceedings of the National Academy of Sciences, A new gaseous signaling molecule emerges: Cardioprotective role of hydrogen sulfide, 11/08/07, <http://www.pnas.org/content/104/46/17907.full?sid=376f5897-54c2-4c4c-84ee-ad33dd00ebb9>

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