

## Does Your Blood Hold the Secret to Slower Aging?

There's so much hype and misinformation when it comes to anti-aging and longevity, you can spend a lifetime trying to separate fact from fiction. Even so, I'm always searching for ways to live a longer, healthier, more productive life. To that end, there is new research that I think



*Dr. David Williams*

may allow us to slow and possibly reverse parts of the aging process. It involves blood.

It's not too surprising to me that researchers would return to the idea that elements in our blood are linked to longevity. Blood holds an amazing place in the history of medicine. (See page 5.)

Some studies have shown that donating blood once every three years can lower the risk of cardiovascular disease and possibly cancer. One study compared 655 blood donors to 3,200 non-donors and found a 50 percent reduction in cardiovascular risk. Another study reported a 40 percent decrease in risk. Neither study found any additional benefit from donating more frequently. (*Heart* 1997;78:188-93) (*Transfusion* 2002;42:1135-9)

These and other studies focused on the possibility of reducing

iron levels through blood donation. Some have reported benefits and others haven't. The different findings probably stem from the fact that unhealthy people typically don't or aren't allowed to give blood. This can skew the results. One of the most recent studies I've found attempts to adjust for these factors and discovered that the benefit is only a 7.5 percent reduction in cardiovascular risk. (*Transfusion* 2015;55(10):2479-85)

While excess iron plays a role in cardiovascular disease for some people, it's apparently not as big a factor as once thought. Don't get me wrong; a 7 percent reduction in any disease is significant. And it's important to keep in mind that excess iron has also been linked to Alzheimer's and diabetes. There are numerous benefits to donating blood and a decrease in iron is only one of them.

We've only touched the surface when it comes to understanding the compounds in our blood and how they relate to how long we live. In the last few years, researchers have begun to isolate various proteins found in plasma. Plasma is the pale yellow liquid part of the blood that carries red cells, white cells, platelets, proteins and nutrients. It makes up about

55 percent of the blood, and is 92 percent water.

Animal studies have found that when the circulation system of older mice is co-joined with that of younger mice, the older mice began to show signs of rejuvenation. Their liver and skeletal stem cells revert to a more youthful state. There are distinct structural improvements in the neurological connections within the brain, resulting in improved memory and cognition. Physical endurance increases dramatically and there is evidence of rejuvenation in practically every organ, including the liver, heart, and muscles.

Researchers analyzed many of the 700 proteins found in plasma. They found they could accurately determine a person's relative age simply from the variations in these proteins. More importantly, at least in mice, one of the researchers commented, "It tells us that the age of an organism, or an organ like the brain, is not written in stone. It is malleable. You can move it in one direction or the other. It's almost mythological that something in young organisms can maintain youthfulness, and it's probably true." (*Nat Med* 2014;20(6):659-63) (*Clin Exp Pharmacol Physiol* 2013;40(7):412-21) (*Nature* 2011;477(7362):90-4) (*Nature*

2005;433(7027):760–4) (*Cell* 2013;153(4):828–39)

The changes in animals have been so dramatic that there are already human trials testing the efficacy of giving plasma transfusions to 18 people with moderate to severe Alzheimer's. The plasma donors are aged 30 or younger and the recipients range in age from 50 to 90. The results of the trial are expected within the year, but it could take up to 15 years before researchers figure out exactly what proteins trigger healthy stem cell function and then make an injectable cocktail.

I don't know if/when young-to-old plasma transfusions will become commonplace. Since plasma isn't a drug, the testing process is moving very fast. Plasma for transfusions is filtered to remove all the blood cells, leaving the antibodies, clotting factors, hormones, nutrients, and other proteins. These transfusions are proven safe and have been used for years to treat clotting disorders.

At least one company in this country has begun offering plasma transfusions directly to the public... at \$8,000 a pop. They recommend receiving two transfusions a year. Yikes. That's not a bad markup considering blood banks pay about \$30 per donation to donors.

It's hard to imagine a time when frequent transfusions would ever

be commonplace for everyone. Frankly, there wouldn't be enough plasma to go around. Plasma is already in short supply at most blood banks. But with this latest research data, I have no doubt transfusion clinics will start popping up all over the world. Unlike blood, plasma can legally be sold. With the Internet, there's already a worldwide black market for just about anything.

### Blood Components That Decrease With Age

Rather than wait to learn exactly which of the 700-plus blood proteins might be used to rejuvenate the body, I started to take a closer look at other factors in the blood. I wanted to know the difference between young and old blood, what blood factors influence longevity, and exactly how we can return them to youthful levels.

#### Oxytocin

Oxytocin is secreted by the pituitary gland. It has been called the "cuddle chemical" and the "love hormone." It is released when people snuggle, bond socially, fall in love, get sexually aroused, or have an orgasm. It is associated with trust, empathy, and generosity, and helps the brain deal with fear, anxiety, stress, and pain.

Oxytocin is only available via prescription as a nasal spray. If you

see it being sold elsewhere, it's bogus. There are no supplements that directly boost oxytocin levels.

The best ways to naturally increase oxytocin are massage, loving touch, sex, hugs, empathy, meditation, charitable giving, volunteer work, positive interactions with animals, and experiencing moments that bring about "Ahhhh, how sweet" reactions.

#### Melatonin

Melatonin is produced in the pineal gland, which tends to atrophy and calcify with age. In past articles, I've discussed reasons for this calcification, the health ramifications, and what you can do to stop or reverse it. (See the November 2014 issue to learn more.)

Melatonin is best known for its sleep-inducing properties. Considering an estimated 40 percent of Americans show calcification in the pineal gland by age 17, it's no wonder sleep problems are so common.

But melatonin isn't associated with just sleep. It is a very important signaling hormone that influences genetic expression and changes throughout the body. Additionally, it's a powerful antioxidant, especially when it comes to the protection of DNA.

Since melatonin is inexpensive, safe, and readily available over the

## Alternatives. Author: Dr. David Williams; Editor: Larissa Long

ISSN# 0893-5025. Published monthly for \$69.99/yr. by Mountain Home Publishing at 6710-A Rockledge Dr. Ste. 500, Bethesda, MD 20817. Editorial Office: 6710-A Rockledge Dr. Ste. 500, Bethesda, MD 20817. Periodicals postage paid at Bethesda, MD and at additional mailing offices.

Postmaster: Send address changes to *Alternatives*, PO Box 11, Montoursville, PA 17754. Copyright © Healthy Directions, LLC All rights reserved. Photocopying or reproduction is strictly prohibited without permission from the publisher.

The approaches described in this newsletter are not offered as cures, prescriptions, diagnoses, or a means of diagnoses to different conditions. The author and publisher assume no responsibility in the correct or incorrect use of this information, and no attempt should be made to use any of this information as a form of treatment without the approval and guidance of your doctor.

Dr. Williams works with Healthy Directions, LLC to develop his unique formulations that supply many of the hard-to-find nutrients he recommends. Dr. Williams is compensated on the sales of these nutritional supplements and health products, which allows him to continue devoting his life to worldwide research and the development of innovative, effective health solutions.

counter, it is easy to restore levels to those of our youth. Dosages range from 1–5 mg, taken before bedtime.

### Human Growth Hormone

Also produced in the pituitary gland, human growth hormone (HGH) triggers childhood growth and the maintenance of tissues and organs throughout life.

Research has shown that adults who administer synthetic HGH lose fat and increase muscle mass. The side effects of these injections, however, can be varied and serious. They include everything from joint inflammation and abnormal growth of the bones and organs, to diabetes and cancer. Fortunately, you don't need to take exogenous growth hormone to restore youthful levels. There's an easy method to increase HGH levels without any of the harmful side effects.

Finnish researchers discovered that two 20-minute sauna sessions at 176 degrees F, separated by a 30-minute cooling period, doubled growth hormone levels from their starting point. When the two sessions, still separated by the 30-minute cooling period, were reduced to 15 minutes and the temperature was raised to 212 degrees F, there was a five-fold increase in growth hormone.

The greatest increases occurred with repeated sauna use. Two one-hour sessions a day, at 176 degrees F for a period of seven days, increased growth hormone levels by 16-fold on the third day. Granted, two one-hour sessions is extreme, but it does illustrate just how effective saunas are at boosting growth hormone levels. (*Springerplus* 2015;4:321) (*Eur J Appl Physiol*

*Occup Physiol* 1989;58(5):543–50) (*J Hum Kinet* 2003;9:19–30)

If you want to boost HGH levels, you also need to minimize your consumption of carbohydrates before bedtime. Carbohydrates trigger insulin release, which can switch off any production of growth hormone for about two hours. This is a crucial time period since the largest secretion of growth hormone occurs about an hour after the onset of nighttime sleep. This one secretion from the pituitary can account for as much as 80 percent of its total daily output.

### Heat Shock Proteins

When you raise your core temperature for short periods of time, your body produces heat shock proteins (HSPs). It's part of homeostasis—changes in genetic expression that help protect your body from similar environmental stress in the future. It could be the basis for the statement, "That which doesn't kill us makes us stronger."

HSPs boost your endurance, improve cardiovascular efficiency and blood flow, increase plasma volume, red blood cell count, and oxygen transport, and enhance your ability to make and preserve muscle tissue.

Today, most of us live in climate-controlled environments and are rarely exposed to extreme temperatures that could trigger the production of HSP. This is another area where a sauna can help.

### Coenzyme Q10

Coenzyme Q10 (CoQ10, also called ubiquinone) could best be described as a fat-soluble vitamin. It's produced in the body, but production declines with age. Ideally we should be able to make up any deficit from our diet. However, even

the richest food source, sardines, contains only 6.4 mg per 3.5-ounce serving. Daily therapeutic doses typically range from 90–400 mg.

Increasing CoQ10 levels through supplementation has been proven repeatedly to reduce the risk factors of heart disease and improve fatigue, fibromyalgia, oxygen utilization, periodontal disease, and many other age-related ailments. If there's any downside, it's the cost.

### Progesterone

This is another hormone that I've discussed in detail. It can be truly life changing, especially for women suffering from estrogen dominance. See the May 2014 issue of *Alternatives* for complete information.

### Testosterone

There are supplements that can help increase declining testosterone levels, but the testes must still be functional, and the degree of success seems to vary among individuals. One of the more effective testosterone boosters I've uncovered is called tongkat ali (*Eurycoma longifolia* Jack).

From 2000–2003, I worked with researchers in Malaysia to assess the viability of introducing their native medicinal plants to the rest of the world. I shared that adventure in my October 2003 issue. At the time, tongkat ali wasn't available in this country, so I worked with another company in Indonesia that was willing to ship the product to the US.

Fortunately, several US companies now sell it. NOW Foods markets a couple of products that I can recommend: TestoJack 200 with a combination of ingredients,



and TestoJack 300 with just the herbal extract.

In some men, the testes have atrophied to the point that products like tongkat ali won't work. In these cases, using the actual hormone is the only way to raise levels. Testosterone requires a prescription and regular monitoring. If you choose to go this route, I recommend using a natural testosterone cream compounded by a compounding pharmacist rather than shots, implants, or gels of the synthetic hormone.

### TSH & T4

As we get older, thyroid stimulating hormone (TSH) from the pituitary gland and thyroxine (T4) from the thyroid gland commonly decline, especially in women.

Hypothyroid-associated symptoms are very similar, if not identical, to the symptoms we associate with the aging process. I believe that hypothyroidism is one of the most undiagnosed conditions in our society. I've devoted numerous issues to discussing this problem, and exactly how to test for and treat the condition naturally.

## Blood Components That Increase With Age

Here are some of the major blood components that *increase* with age.

### Pituitary Hormones

Luteinizing hormone (LH) is produced in the pituitary gland.

In women, LH acts on the ovaries to release mature eggs. It also stimulates the ovaries to increase production of estrogen and progesterone at the appropriate times during the menstrual cycle. Higher levels of LH that occur with aging are an indication that the ovaries

are losing their ability to function. The pituitary sends out additional LH in hopes that more stimulation will push the ovaries to produce.

In men, LH stimulates the cells in the testes to produce testosterone. Similarly, as a man ages, his ability to produce testosterone declines and additional LH is sent by the pituitary gland to try to increase production.

Follicle-stimulating hormone (FSH) is also produced in the pituitary gland. FSH is one of the signaling molecules that trigger menopause. Many researchers believe both LH and FSH are intentionally used by the body to increase mortality.

In women, higher FSH levels have been linked to premature aging, weight gain, bone loss, osteoporosis, and fat accumulation. An imbalance of LH and FSH often results in polycystic ovary syndrome (PCOS).

Correcting an excess (or, more correctly, creating a balance between LH and FSH levels) is often more complicated than just taking a supplement. While the pituitary gland is no larger than a pea, it is referred to as the "master gland" of the endocrine system because it makes the hormones that control the functions of many other glands like your thyroid, adrenals, ovaries, and testes. An imbalance in any of these glands contributes an additional workload on the others and can disrupt pituitary function. For instance, chronic adrenal and thyroid issues eventually result in a weakened pituitary gland.

The fact that we are swimming in a sea of environmental estrogen is a major factor in the disruption of LH and FSH levels. All of

the xenoestrogens (estrogen-like) compounds now in our food and water supply, along with our exposure to pollution from various plastics, cleaners, solvents, pesticides, and herbicides, have resulted in widespread estrogen dominance.

Under ideal circumstances, a woman's estrogen is balanced by progesterone. The pituitary gland indirectly influences progesterone production through the release of LH. But even the increase in LH isn't always enough to counteract the imbalance caused by environmental estrogen exposure.

This imbalance has resulted in young girls starting their periods much earlier, which increases their risk of breast and other cancers later in life. In 1900, the average age that a girl entered puberty was 14.2. Contrast that with one of the most recent studies, which found by the age of 7, 14 percent of white girls, 23.4 percent of black girls, and 14.9 percent of Hispanic girls had reached puberty. At 8 years old, 18.3 percent, 42.9 percent, and 30.9 percent, respectively, had reached puberty. (*Pediatrics* 2010;126(3):e583-90)

Estrogen dominance has also resulted in an epidemic of problems like irregular periods, infertility, weight gain, loss of libido, PMS, depression, Alzheimer's, fibrocystic breasts, endometriosis, gallbladder problems, ovarian cysts, PCOS, and thyroid disease.

In men, increased exposure to xenoestrogens can neutralize the masculine traits associated with testosterone. It results in fatigue, depression, lower sperm counts, infertility, erectile dysfunction, weight gain, and moobs ("man boobs"). As testosterone levels

## The History of Bloodletting

Hippocrates thought that women purged blood monthly to rid themselves of toxic “humors.” He concluded that men would also benefit from an induced form of menstruation...bloodletting. (The body was thought to require a balance of four fluids, or “humors,” as they were called: blood, phlegm, yellow bile, and black bile. Doctors at the time looked at patient’s urine and determined which humor was out of balance and remedied it with either bloodletting or vomiting.)

Bloodletting has actually been extremely common for at least the last 2,000 years. It was common in ancient Egypt, Greece, Rome, and China. You’ll find bloodletting and bloodletting devices depicted in many ancient drawings from those areas. In the medieval period, the most prominent religious institutions encouraged a lot of bloodletting. It was performed on scheduled days, as many as five times a year for the healthy followers. Monks in Switzerland were to be bled on the first day of every month. It was a privilege to be bled on a regular basis, a privilege that soon spread to the masses.

Not only was prophylactic bloodletting popular among the healthy, by the 1800s, one was bled for practically every conceivable condition you can imagine, regardless of how serious or trivial. You could be bled for everything from

constipation and pregnancy to having a cough, headache, typhoid, flu, epilepsy, fever, anxiety, or arthritis. There were even laws enacted to use bloodletting to treat “drunkards, offenders against morality, homosexuals, and criminals of various types”. (*Theory and Practice of Bloodletting, Heinrich Stern, pg. 243, Rebman Company 1915*)

Bloodletting became the most common treatment for virtually every medical complaint. And if that isn’t bizarre enough, you were bled standing up...until you fainted. (Standing helped speed up the process.)

Surgeons learned to take advantage of the fainting induced by bloodletting. Patients were bloodlet prior to an operation as a form of anesthesia.

It’s no coincidence that the lancet, or knife used to obtain blood, was a symbol of the medical profession and of their status as doctors. It also happens to be the name of one of the world’s oldest and most renowned medical journals, *The Lancet*.

Every hospital and physician practiced bloodletting. Here’s an excerpt from page 532 of *The British Homeopathic Review*, Vol 40, that I ran across in my research.

*“...persons came to the hospital, especially at the ‘spring and fall,’ to be bled by the dozen or twenty in the morning... they commonly fainted, and they might be seen lying in rows on the surgery floor like so many slaughtered sheep... ‘When I*

*was a student at the Meath Hospital hardly a morning passed when some twenty or thirty unfortunate creatures were not phlebotomised. The floor was running with blood to such an extent that it was difficult to cross the prescribing hall for fear of slipping. Patients were seen wallowing in their own blood.”*

Patients demanded to be bloodlet and soon barbers became practitioners of bloodletting. Barbers were far less expensive and more accessible than doctors. In addition to cutting hair, shaving, and bloodletting, barbers were allowed to treat ailments of the outer body (set broken bones, amputate limbs, give enemas, pull teeth, treat wounds and skin conditions, etc.), while doctors treated problems below the skin.

The traditional barber pole evolved as a sign to let the public know they performed bloodletting. The pole itself represents the white rod that patients gripped tightly to increase blood flow. Barbers used white bandages to clean up afterwards. The bloodied bandages were hung out to dry on the pole after they were rinsed. The red strips symbolize the bloody bandages. The brass bottom of the barber pole represents the bowl used to catch the blood. The blue stripes came later and are thought to represent the color of veins.

Most bloodletting stopped in the early 1900s, only to have a short revival during World War I, when it was used in the trenches to treat victims of mustard gas attacks.

decline, the pituitary gland ramps up production of LH in an attempt to get the testes to make more, but it’s like beating a dead horse.

Avoiding exposure to xenoestrogens and balancing the endocrine

glands are two ways to help return LH and FSH levels to those found in younger blood. (For an in-depth discussion on estrogen dominance and detailed methods on how to reverse it, refer to the May 2014 issue

of *Alternatives*. You can also find information at [drwilliams.com](http://drwilliams.com).)

### Cortisol

Cortisol is widely known as the “stress hormone.” It is produced

and released by the adrenal glands in response to stress and low blood sugar levels. Under normal circumstances, cortisol calms inflammation, but that changes with chronic psychological or physical stress.

Prolonged stress alters cortisol's effectiveness at regulating inflammation because it decreases tissue sensitivity to the hormone. Your immune cells become insensitive to cortisol's regulatory effect. Chronic stress leads to uncontrolled inflammation, and this inflammation has been directly linked to heart disease, diabetes, cancer, asthma, rheumatoid arthritis and other autoimmune diseases, Parkinson's, Alzheimer's, and many other conditions.

### Wnt

Wnt consists of a large group of signaling proteins that are involved with controlling stem cell activity and tissue self-renewal. Trying to comprehend the activity of these proteins is very confusing (at least to me), and their "signaling" changes as we age.

Mutations in these proteins are responsible for numerous genetic diseases. And as we age, instead of helping to regenerate tissue, Wnt signaling can inhibit healing and impede the regeneration of muscle. Later in life, it can also act as a growth factor in cancer.

Several natural products have been shown to help block Wnt's influence in cancer. Many of these products, as you might expect, exhibit strong antioxidant properties. They are also ones I've been talking about for years and have added to my daily supplement formulations. They include selenium, resveratrol, lycopene, fish oil,

quercetin, curcumin (from turmeric), green tea polyphenols, niacin, niacinamide, and vitamin D.

Also important are cruciferous vegetables (and diindolylmethane, or DIM, supplements derived from these vegetables), which almost always show up in longevity studies.

One of the more unusual compounds that has been shown to block Wnt protein's promotion of cancer is apple seed extract. Apple seeds contain the compound amygdalin, which is totally harmless as long as the seed stays intact. When chewed or broken, though, amygdalin degrades into hydrogen cyanide, and cyanide can be poisonous in high doses.

Amygdalin is also found in the seeds of almonds, apricots, peaches, and cherries. You might remember years ago when raw apricot kernels were being promoted to prevent or treat cancer.

Although I wouldn't recommend gorging on apple seeds (if that's even possible), the possible danger from consuming apple seeds has been overblown.

A whole apple might contain as many as 20 seeds, and keep in mind if they aren't chewed and broken, they will pass through your digestive tract without any risk. A 140-lb woman would have to eat or chew between 189 and 5,292 seeds to risk death. A 190-lb man would need to consume between 256 and 7,182. So, in short, swallowing a few apple seeds is safe and one way to bring down Wnt blood levels.

### NFkB

NFkB is a cytokine (a signaling molecule) that triggers

inflammation. Many researchers now call it the single most important factor causing inflammation in the body.

NFkB has been linked to a host of autoimmune diseases and cancers. Like cortisol, NFkB blood levels increase with stress, so exercise, meditation, and yoga will help lower levels.

NFkB also increases with oxidative stress, obesity, overeating (especially excess carbohydrates), high glucose levels, smoking, lack of sleep, overexposure to UV rays, alcohol consumption, heavy metal exposure, circadian rhythm disruption, and vitamin D deficiencies.

You can lower NFkB by consuming a wide variety of fruits and vegetables, especially berries and, once again, cruciferous vegetables. Other foods and spices that lower NFkB include lycopene-rich foods (tomato and tomato products like ketchup, sauce, and paste), fish and fish oil, olives and olive oil, green tea, capsicum (chili peppers), cinnamon, ginger, garlic, cocoa, flax, sesame, cumin, anise, fennel, basil, rosemary, and pomegranates.

Specific supplements that lower NFkB include melatonin, N-acetylcysteine, SAME, lipoic acid, zinc, pregnenolone (which helps in the conversion of progesterone, cortisol, and estradiol, the dominant form of estrogen), zinc, magnesium, clove extract, licorice root, curcumin, white willow bark, kombucha, boswellia, EGCG, cat's claw, theaflavins, resveratrol, and berberine.

The herb feverfew, which I've recommended in the past for migraine headaches, seems to be

particularly adept at blocking the inflammatory signaling process of NFkB. Many research studies specifically utilize feverfew when they need to block NFkB activity. (*Chem Biol* 2001;8(8):759–66)

## Estrogen

Yes, levels of estrogen produced by the body decrease with age. However, there tends to be an excess of estrogen relative to the other hormones and factors necessary for counteracting and balancing estrogen's effects.

Two of these factors, progesterone and thyroid hormones, are in short supply as we age. And our exposure to environmental xenoestrogens just makes the problem worse.

The effects of chronic exposure to estrogen are the same symptoms we usually associate with the aging process. These include autoimmune diseases, increased inflammation, glucose intolerance leading to diabetes, tissue fibrosis and hardening, osteoporosis, arthritis, weight gain, and an increased risk of cancer.

Research studies have shown that the longer a woman is exposed to estrogen, the greater her risk of developing breast, ovarian, and other cancers related to estrogen. And the longer a woman menstruates, the higher her lifetime exposure to estrogen and the higher her risk of cancer.

Cancer is more common in women who began menstruating before age 12 or reach menopause after age 55. Women who began their periods before age 12 have about a 20 percent higher risk of breast cancer compared those who

began after age 14. (*Lancet Oncol* 2012;13(11):1141–51)

While I've been talking primarily about women, blood estrogen levels in older men also become higher in relation to testosterone. This subjects men to many of the same symptoms associated with premature aging.

It probably goes without saying that everyone needs to minimize exposure to xenoestrogens. In addition, you can help your liver clear excess estrogen.

Even under ideal circumstances, the liver is always removing and detoxifying excess circulating hormones from the bloodstream. Research has shown that the body's own estrogen is a burden on the liver, and a woman's ability to process toxins is typically slower than a man's.

Every day, we absorb toxins through our skin and gastrointestinal tract and from the air we breathe. Ridding the body of these environmental toxins can take priority over detoxifying excess hormones. Constipation and poor gut flora just compound the issue and allow estrogen to wreak havoc. I can't think of a single case of estrogen dominance where constipation or other bowel problems weren't a factor.

Correcting bowel problems with fermented foods, daily probiotics, and more fiber and water consumption gives the liver a chance to clear excess estrogen. You can't overcome an estrogen dominance problem without correcting bowel function.

Although it doesn't seem like men have as much of an issue

with constipation overloading the liver, they have another problem to contend with: the aromatase enzyme, which converts testosterone into estrogen. Zinc is the number one inhibitor of this reaction, and it also happens to be one of the most common mineral deficiencies in men. Make sure you're getting 20–50 mg of zinc daily. Other substances that help block aromatase include selenium, melatonin, green tea, and flavonoids.

It's also important to remember that the liver and thyroid work hand in hand. The thyroid produces two primary hormones: T4 and T3. T4 has to be converted into the more active T3 form, and most of that conversion takes place in the liver, kidneys, and muscles. If you have a sluggish or overworked liver, this conversion becomes impaired and leads to all the symptoms of hypothyroidism.

Most doctors don't realize that this conversion process still has to take place even when someone takes thyroid hormones. An overworked liver is one of the main reasons patients don't always respond to thyroid medication.

Research also suggests that the health of your liver depends on the health of your thyroid gland. Studies have found that hypothyroidism is a factor in the development of nonalcoholic fatty liver disease, which now affects around 25 percent of the adult population in this country. (*J Clin Endocrinol Metab* 2016;101(8):3204–11)

There's a pretty long list of items that help lower estrogen levels: EPA fish oils, B vitamins (particularly B6, B12, and folic acid) and, once again, the cruciferous



vegetables (and DIM). Cruciferous vegetables continually show up when it comes to the topic of longevity, so be sure to eat your cabbage, broccoli, and Brussel's sprouts.

### Aromatase

As I mentioned in the last section, aromatase is an enzyme that causes the conversion of testosterone into estrogen. High levels of aromatase further raise estrogen levels. There are some prescription drugs that work as aromatase inhibitors, but they come with side effects.

Besides zinc and the other nutrients I suggested in the last section, there really aren't any natural compounds that can totally inhibit aromatase activity. The best option is to eat cruciferous vegetables and/or supplement their extracts, DIM as well as Indole-3-Carbinol (I3C) at 500 mg daily.

### CCL11

CCL11 is a pro-fibrotic cytokine (another signaling molecule) involved in allergic responses. It has been implicated in cardiovascular disease, cancer, asthma, COPD, autoimmune diseases, diabetes, Crohn's disease, and ulcerative colitis. Not only are high levels associated with aging, greater concentrations of this factor are found in cannabis users and people suffering from schizophrenia.

The diabetes drug metformin has been shown to suppress CCL11. That's why some people have suggested using it as an anti-aging drug.

Berberine (500 mg three times a day with meals) has been found to be just as effective as metformin in the treatment of type 2 diabetes. And while it has also been shown

to suppress other pro-inflammatory cytokines, I haven't seen any specific research showing it suppresses CCL11. But I'm not sure anyone has tested it for that yet.

There's also research indicating blood levels of cytokines could be reduced with mung beans (or mung bean sprouts) and green tea or green tea extract.

### In Conclusion...

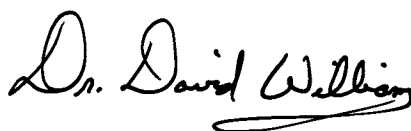
More and more research points to the idea that aging is not just a process of wear and tear, rather a result of the damage that has accumulated over time.

Aging may be a preprogrammed event that is mediated by various signaling molecules, like many of those I've discussed.

This latest research indicates that, with the proper signaling molecules, systems that repair and regenerate the body can be reactivated and are perfectly capable of returning the body to a more youthful state. It will be interesting to see what develops in the next few years. In the meantime, we have enough information to know we're on the right track.

By following a healthy diet, supplement regimen, and exercise program, we're increasing signaling molecules we currently know to be beneficial. I'll continue to separate fact from fiction, update you, and tweak recommendations as the research unfolds.

Until next month,



## This Month Online



Visit my website at **drwilliams.com**, where you'll find information and recommendations for many of your top health conditions, including:

- *Strengthening Immunity*
- *Hiatal Hernia, GERD, and other Digestive Concerns*
- *Cognition and Brain Health*
- *Weight Loss*

Stay in touch between newsletter issues by signing up for my weekly Health E-News. Simply visit **drwilliams.com** and submit your email address.

You can also read my blog, which covers a variety of topics. Here are just a few of the most recent additions:

- *Natural Homemade Sunscreen*
- *Ashwagandha Health Benefits*
- *Healthy Hacks: Natural Remedies for Aching Joints*
- *9 Health Benefits of Turmeric*

## Contact Us Here

- To submit a Mailbox question, suggest an article topic, or make a comment about this month's issue, email **feedback@drdavidwilliams.com**.
- For customer service matters such as address changes, subscription renewals, or to order back issues or reports, call 800-527-3044 (Monday through Friday, 9:00 am–5:00 pm EST) or email **custsvc@drdavidwilliams.com**.