The Immortality Pill - Available Now

How Nobel Prize Winning Anti-Aging Science on Telomeres, Telomerase and TA-65 Can Help You Live Longer and Healthier, Fight Aging, and Stay Young

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I am not a doctor or medical professional of any kind.

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Introduction

What causes us to age?

At first, that sounds like a stupid question. Aging is such an intrinsic aspect to the human condition we tend to take for granted it…just…happens.

But we live in a world of cause and effect. Aging is an effect, so what is the cause?

The common way of thinking about this is from the perspective our bodies are physical, and everything else that's physical eventually wears out or breaks down, such as our cars, our houses, and even our computers.

That's known as the "wear and tear" theory of aging.

But our bodies are different from such items because they're alive and, in optimum conditions of health, regenerate themselves if at all possible.

Cuts heal over, broken bones knit and so on.

Indeed, every day millions of our cells die in the course of performing their functions. They're simply replaced by new cells. Our bodies can even work around permanently damaged tissue, even including the brain itself.

However, at a certain point, our bodies become less able to repair and regenerate. About age 40 we stop totally repairing and processing all the protein from our dead and damaged cells. Like a declining city running out of tax revenue, services such as street repair and garbage collection get farther and farther behind.

Another quick answer people have is "gravity." And Earth's gravity field does continually pull us down. True, but it's what our bodies evolved to cope with. Without gravity, Space Lab astronauts rapidly begin to experience muscle atrophy, skeletal deterioration and other function loss. To avoid long term health problems they must exercise heavily to mimic the effects of constant gravity.

Besides, while gravity may explain some body wrinkles it doesn't explain the white—or no —hair of aging.

Fear of death and the desire to live (youthfully) forever have obsessed humanity since the dawn of our species.

In the last hundred to hundred-fifty years or so, the average life span of people—especially in the developed world—has increased dramatically. Credit for that goes principally to improved sanitation, antibiotics, improved care of infants and small children, and an increase in the food supply.

Thanks to good sanitation and clean public water, people are not exposed to as many infections. People eat more protein to keep their immune systems strong and so resist the infectious organisms they do encounter. If they do get an infection it'll most likely be cured by a drug. Babies and children especially benefit from this.

Nor should I neglect to mention the United Nations project of the 1960s-1970s which removed the smallpox virus from humanity.

So we've removed or dramatically reduced many of the causes of childhood through adulthood death.

We've living longer because more of us reach old age. Once there, however, the main causes of death are heart disease, cancer, and strokes.

The medical establishment has created heroic measures to help people with these and related problems.

But what if we could avoid them altogether?

How long would we live?

Isn't that a better question?

Not—what causes aging—but: how can we slow it down or stop it completely?

Of course, it's assumed we need to know the "why" of aging before we can hope to "cure" it.

Medical science has gone much farther than the general public realizes in discovering why we age.

What's even better, though many practical applications of today's discoveries are still in the future, you can today buy a supplement designed to directly address the cause of aging.

That's the purpose of this short report—to tell you about the Nobel winning medical research that may hold the key to an extra long lifespan, and the supplement which is available right now to help you live longer.

Chapter One

Life Expectancy Vs Life Span

Nontechnical chapter summation: Life expectancy is the number of years you might live as an average of everybody else your age. Life span is the actual number of years you as one person do live.

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This short report uses the terms "life expectancy" and "life span" a lot, so I decided to add this short section to make clear what I mean by these terms, because a lot of people get them wrong.

"Life expectancy" is the AVERAGE number of years you are expected to live once you reach a certain age (or at birth, as is often the case). It applies not to you as an individual, but to you and everybody else your age as a group.

"Life span" is ACTUAL number of years you as an actual, individual person reaches.

Averages are Not Necessarily Representative

A lot of time you hear such statistics as how the life expectancy of a baby born in 1600 was age 30.

And lots of people therefore believe people in past times were old at 25 and dropping dead with white hair and wrinkles at 30.

That's not true at all.

That life expectancy is an average of how long lots of people lived.

Until modern times in the developed world—and to this day in many parts of the developing world—many people died as infants and small children.

Dehydration due to diarrhea, smallpox, starvation, and many other infectious diseases and dangers contributed to this.

The average life expectancy was low not because people were arthritic in their 20s, but because so many people died in infancy and childhood.

If you were strong or lucky enough to reach age 5, you probably grew to young adulthood. You didn't die of old age at 25, but you were still subject to periodic famines, wars, giving birth, epidemics, hunting accidents and random violence.

Not to mention infection caused by wounds. In an era where people believed taking baths was unhealthy any wound could easily become infected. And antibiotics were hundreds of years in the future, so it was easy to die from what we'd consider a trivial scratch.

If you were strong, smart or lucky enough to avoid these problems, then you could live to the Bible's "three score and ten" (70) years or even older.

An Example

Many years ago I explored the spot in Minnesota where The Mississippi River begins. Close to it is a pioneer cemetery. I was struck how, according to the markers, so many of its "residents" were either young children or older adults.

Here's a simple illustration:

Joe died shortly after birth. His lifespan was 1 month.

Mary's lifespan was 100 years.

Their combined (average) life expectancy was:

0 + 100 = 100 / 2 = 50

However, that obviously doesn't reflect the reality either person lived. Neither one died of "old age" when only 50 years old.

Your Birth Year Doesn't Predict Your Life Span

Think of yourself. You may have read when you were born your life expectancy was X years —you and every other one of the millions of babies born that year. And that statistic was accurate based on the best knowledge of the time.

But some of those babies died in childhood. Some of them died in car accidents.

The year you were born says very little about how long you as an individual will live. That depends on your lifestyle, whether you smoke, whether you drink and how much, what and how much you eat, whether and how much you exercise, where you live and many other factors, some under your control and some not.

Modern Medical Science

Modern medical science has greatly increased life expectancy at birth by reducing the rate of infant mortality.

Public health, greater knowledge and practice of hygiene, and increased wealth have also done a lot.

Life expectancy has already increased because modern medicine has a lot more effective and sophisticated ways to keep you alive if you suffer a medical emergency such as a heart attack and stroke.

Obviously they're far from perfect, but if you have a heart attack in 2011—and you don't die before you reach a hospital—you have a much better chance of surviving it than you would have had fifty years ago.

All these things have increased the average age at which people in the developed world (and to some extent the developing world as well, as people there learn modern medicine, build hospitals and clinics, teach hygienic practices to school children, and receive increased incomes to improve their diet.) die.

More Good News

The longer you live, the longer your life expectancy.

If you can read these words, you won't die as an infant.

If you're over 21, you're past all childhood causes of death.

If you're 50, you've proven you're tougher than the people who died of heart attacks in their forties, and so you're more likely to reach 80 than you were when you were born.

If you're now 80, you stand a decent chance of reaching 100.

Even More Good News

All these statistics are based on the past. For example, if you were born more than 20 to 30 years ago (and I doubt many really young people are reading this report), chances are your REAL life expectancy at birth was higher than what the life insurance companies computed at that time—because at that time they couldn't figure in the future medical advances that have happened.

None of these numbers can predict dramatic changes in the world.

For example: a widespread thermonuclear war would obviously reduce all our life spans and life expectancies—for those few people left alive.

Or if aliens land next week and teach us the secret to immortality then we'll all obviously live a lot longer than we think right now.

This Book is About Extending Human Potential Life Spans

However, there's no reason to believe medical science has yet increased the maximum lifespan people are capable of.

So far, medical advances have helped a lot of people live longer and better, but still very few of us reach the 120-130 years a few people have attained. This seems to be the upper limit.

However, the more modern medical research learns about our bodies and how and why we age and die, the closer we come to extending human actual life span.

That's what the rest of this book is about—extending human life span.

Yours, and—I hope :)—mine.

Chapter Five

Telomeres

Nontechnical chapter summation: Telomeres are protein "caps" at the ends of your chromosomes that help hold them together and apart from each other. Every time a cell divides, these telomeres grow shorter. Eventually they are so short the cell cannot divide, and dies, making you less healthy and older, until you eventually die too.

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Scientists do know why the Hayflick Limit exists.

It goes back to a problem first noticed by the pioneers who discovered the double helix structure of DNA.

When a cell divides through mitosis, its strands of DNA split in two. (There are 46 pairs of chromosomes in every cell.)

Think of unzipping a zipper that's not embedded in any clothes.

Then, thanks to the enzyme DNA polymerase, the proper proteins attach themselves to the half-strands of chromosomes, in the sequence controlled by the genes, to create two complete strands of DNA where there used to be one.

The reproduction of the DNA structure is (hopefully) complete. That's how and why you continue to remain "you," and looking like you.

However, remember the zipper. Because it's not in your jeans or the back of your dress, the ends rip apart, and the "cloth" frays.

In cells the very ends of the chromosomes cannot be replicated. Every time a cell divides, the ends of the strands of DNA break off. If a cell divided without protection, it would lose the ends of its chromosomes and the information they contain. Yet the DNA isn't lost this way. This is known as the end replication problem, and it puzzled scientists until one discovered evolution/nature came up with a clever mechanism to protect the integrity of the chromosomes and their DNA.

Capping Chromosomes for Their Own Protection

That's the very tip or cap on the end, holding the strands of DNA together, like aglets, the plastic tips at the ends of shoelaces.

That tip or cap is a DNA-protein complex known as a telomere. Telomeres consist of up to 3,300 repetitions of a DNA sequence. Like all DNA, they are formed from four nucleic acid bases: G for guanine, A for adenine, T for thymine and C for cytosine.

On one end they're the DNA sequence of nucleotides TTAGGG. That is the same for all vertebrates. Each section of a telomere is a "repeat" of these six "base pairs."

When a human being is first conceived, they start off with around 15,000 base pairs. By the time we're born nine months later, our cells have divided so much we have "only" 10,000 base pairs left. Of course we use a lot of them as we grow up.

They protect the strands of DNA from being mistaken for broken strands of DNA, and being "repaired" by your cell. And from fusing together into rings.

They also protect the DNA from deterioration, or rearranging—from fusing with other strands. (Such abnormalities can cause cancer.) Thus, telomeres promote chromosomal stability.

Every time a cell reproduces, the telomeres are slightly reduced in length, by around 25 to 200 nucleotides or base pairs.

The telomeres protect your DNA. Without them the chromosomes stick to one another and undergo structural changes.

Therefore, the telomeres form a physical obstacle to cells reproducing an infinite number of times. They can't, because the telomeres aren't long enough.

The End of Telomeres is the End of Your Life

Telomeres are sort of like pencils. Every time the cell divides, the telomeres are shortened.

Therefore, like pencils that must be whittled away to keep them sharp, telomeres—and therefore your cells—have a finite lifespan.

This mechanism is called erosion.

Once telomeres are very short—down to about 5,000 basepairs—cells do not respond to the usual triggers signaling them to divide.

Once your body's telomeres are mere stubs, your genetic material is no longer safe. The cells can't reproduce.

Once telomeres have reached this "critical length," they can no longer divide and replicate. This cellular aging is known as senescence, or replicative senescence.

Once your cells can no longer divide, they can live for years, but do start to die off (aptosis), and this decreases the functioning of your vital organs.

Senescent cells give off proteins that damage surrounding tissues. They're like empty/abandoned houses bringing down the value of the neighborhood. They degrade the architecture and therefore the function of the surrounding tissue.

Obviously, one dead cell out of a few hundred billion (We have around 100 trillion cells in our bodies.) doesn't make much difference. But as more of your cells reach this stage and die, you don't have the strength, energy and vitality you once had. You've reached old age. Eventually your vital organs start to fail, and you die.

Exceptions

Exceptions include your heart, white blood cells, eggs and sperm. Heart telomeres do not shorten with age because heart cells do not continually divide. Egg cells don't divide at all.

White blood cells and sperm need to divide many more times the body's average.

Another exception is cancer. Sometimes those cells find a way to divide without limit, which is why they're so dangerous.

Short Telomeres are Associated With a Shorter Life Expectancy

Geneticist Richard Cawthon and colleagues at the University of Utah found in people older than 60, those with shorter telomeres were three times more likely to die from heart disease and eight times more likely to die from infectious disease. People with lower than average telomeres died an average of five years earlier.

Short telomere length is becoming a medical prognostic marker. It helps indicate risk of disease, its progression, and mortality for many types of cancer: including breast, prostate, colorectal, bladder, head and neck, lung, and renal cell.

Short telomeres are associated with increased risk of cardiovascular diseases such as strokes and heart attacks, cancer, diabetes, osteoporosis, loss of cognitive function, dementia, depression, and inflammatory diseases such as arthritis.

Merely a Symptom?

Some scientists say telomere shortening may simply be a symptom of old age, like white hair.

However, they clearly play a critical role in limiting cell division, and therefore in preventing us from living indefinitely.

That doesn't mean other factors are not important. But it makes it unlikely telomeres are merely "symptoms," or their shortening merely "correlated" with other symptoms of old age.

Calvin Harley at McMaster University in Canada and Carol Greider at Cold Spring Harbor Laboratory in the USA discovered in 1990 that telomere shortening is the direct cause of cells reaching the Hayflick Limit.

Other Ways Telomeres Get Shorter

Some studies have found stress (including in children, according to studies of children in orphanages), inflammation and excessive oxidation may also shorten your telomeres.

Studies have also demonstrated telomerase activity in vitro is affected by oxidized-LDL and cortisol.

Therefore, this may be one way these things—already known to be bad for human health—shorten our lives.

Turns out there are many connections between short telomeres and the more well-known causes or symptoms of aging.

Telomeres and Other Aspects of Aging

Nontechnical chapter summation: the ways that the human body ages—including telomeres—tie in well together. What's good for your telomeres is also good for you in other ways.

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Until recently, the free radical theory of aging was the most well-known and commonly accepted.

And telomeres merely update, not override it.

Telomeres can be shortened by other means besides cell division. Its chief enemy is oxidative stress—in other words, free radicals. They no more respect telomeres than they do any other cells. They damage telomeres and the DNA chromosomes.

That helps to explain why so many of the nutritional supplements associated with longer telomeres are antioxidants.

Telomeres are also damaged by high levels of inflammation.

And because methylation helps keep telomeres stable—and may help turn on telomerase—abnormal methylation is potentially a threat to telomere length.

Abnormal methylation is often detected by measuring the amount of homocysteine in your body. It's an inflammatory compound formed by abnormal metabolism of protein, and is correlated with high levels of stress, and is also a marker of having a high risk of heart disease.

If your methylation is normal, your body uses it to reduce levels of homocysteine. If your methylation is abnormal, homocysteine can accumulate and help cause a heart attack or stroke.

Therefore, it appears all the "theories" of aging are correct, except they are symptoms and correlated effects and part of a network of interlinked causes and effects, not a simple "X causes aging."

And all these previous theories and observations tie in well with telomeres and telomerase.

Telomeres are damaged by free radicals from oxidation, and are shortened by stress.

Moderate exercise—which reduces stress—helps keep telomeres longer.

As do antioxidants. And the anti-inflammatory Omega-3 fat from fish oil.

Eating well keeps insulin levels low, and therefore cortisol as well, preventing that hormone from damaging the thalamus and reducing the effectiveness of your endocrine system.

Eating to keep insulin under control means avoiding the sugar which glycation uses to create damaging Advanced Glycation End products (AGEs), such as the age spots on the skin of the elderly.

Antioxidants prevent damage from free radicals to both DNA and telomeres.

This is additional good news. It means you can do a lot to protect your telomeres from premature shortening.

I know most people want to eat whatever they want, as much as they want, whenever they want, fail to exercise, and still remain thin and healthy forever just by taking a magic pill.

Such a pill may be developed someday, but it's not here yet.

It's not my intent to preach to you in this short report, and I'll leave the details to the many full length books you can buy, but it's clear if you wish to remain healthy indefinitely there's no substitute for:

1. Eating to keep insulin lower levels low (cutting out high glycemic load foods).

2. Exercising moderately on a regular basis.

3. Taking plenty of good supplements such as fish oil, Vitamin D, and many antioxidants.

Of course, the real question is, can we somehow slow down the shortening of our telomeres —or even make them long again?

Turns out, the answer is yes

Telomerase

Nontechnical chapter summation: Telomerase is an enzyme which makes telomeres longer. This may hold the key to practical immortality. The one snag is it also enables cancer cells to multiply without limit.

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Dr. Elizabeth Blackburn and her grad student Carol Grieder believed there was something missing from the telomere story. Some telomeres were shorter than others even within the same cell. Sometimes telomeres seemed to grow longer.

If telomere length was simply a mechanical function determined by how many times the cell had reproduced, this made no sense. Also, the researchers discovered telomeres in yeast could grow in length. This told them there had to be an enzyme capable of causing this.

Therefore, they began to look for a substance that actually lengthens telomeres.

In 1985 they found it. In 2009 Elizabeth Blackburn, Carol Greider, and Jack Szostak won the Nobel Prize in Physiology or Medicine "for the discovery of how chromosomes are protected by telomeres and the enzyme telomerase."

Telomerase May Hold the Key to Human Immortality

Telomerase is a reverse transcriptase (TERT) enzyme which can slow the shortening of telomeres, and even increase their length. This accounts for why some chromosome strands within the same person—even the same cell—have longer telomeres than others.

In us it's called hTERT for human reverse transcriptase. It consists of two molecules each of TERT, RNA (TR or TERC), and dyskerin (DKC1). And is a protein of 1132 amino acids.

Some telomeres are lengthened by telomerase attaching newly synthesized telomeric subunits.

Telomerase therefore may be the key to literally extending our life spans.

However, telomerase is also responsible for allowing cancer cells to reproduce without limit. Chapter Ten is about that.

Telomerase consists mainly of protein, and requires protein to function. It also includes a single molecule of RNA containing the nucleotide template for building telomeric subunits.

Telomerase is Built to Add to the Length of Telomeres Like Stringing New Beads Onto a String

Telomerase is shaped something like a mitten, so it can place itself so the template is adjacent to the telomere tip. Then it adds one DNA nucleotide at a time until a full telomeric subunit is formed, like stringing beads. When each subunit is complete, telomerase slides down and attaches another. This process is called addition.

Telomerase is synthesized by nearly all organisms with nucleated cells. Thanks to it, single-cell organisms are virtually immortal. They can keep dividing and multiplying.

Most human cells, called somatic, lack telomerase. Sperm and white blood cells contain lots of it, so they can replicate indefinitely.

Telomerase and Longer Telomeres Promote Better Health and Longevity

A study of Ashkenazi Jews shows the one who inherit a hyperactive form of telomerase that rebuilds telomeres live longer than those without it.

In a study of mice genetically engineered to block the production of telomerase, the mice aged at a much faster rate than normal and died after six months even though their normal lifespan is three years. When the mice are given a drug to turn on telomerase production at six months, their organs were rejuvenated, even bringing back fertility. This certainly appears promising, but is restoring their normal lifespan, not extending it.

In one experiment, scientists added telomerase to human skin cells that already had short telomeres. The telomeres were lengthened, and the skin that grew from them looked young and healthy.

In November 2008 scientists published a paper explaining the results of an experiment where they created mice that continually expressed telomerase. They had life spans 50% higher than normal.

Chapter Eight

Ways to Shorten—or Slow Down the Shortening of—Telomeres

Nontechnical chapter summation: Good health practices slow down the shortening of your telomeres. Bad health practices and stress speed up the shortening of your telomeres.

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Unfortunately, telomeres can be shortened in other ways, besides the normal cell duplication.

Studies have proven stress leads to shorter telomeres. One such study compared telomere length in normal children to those raised in a Romanian orphanage. A study by Dr. Elizabeth Blackburn discovered mothers of normal children had longer telomeres than mothers of chronically sick or disabled children.

In fact, many of the things previously said to "cause" aging, do indeed damage and shorten telomeres as well as other parts of our bodies.

This includes free radicals. So does anything which produces free radicals can shorten your telomeres, such as: obesity, smoking, and lack of exercise.

Telomerase Does Not Change Standard Medical Advice

This obviously leads to the conclusion taking antioxidants such as Vitamin C, Vitamin B, Vitamin A, Vitamin E, selenium, and the many other antioxidants available help protect your telomeres.

According to some, so do multivitamin tablets, reservatrol, green tea, Omega 3 oil and Vitamin D.

A recent study of 2,401 twins found moderate levels of exercise helped slow down the shortening of telomeres. (Over-exercising did not.)

A study of post-menopausal women found exercise protected telomeres from being shortened by stress.

Although nobody really wants to say any particular activity or substance (except the one featured in the next chapter) will actually lengthen telomeres, on the website of Telome Health, Inc, the company founded by Dr. Elizabeth Blackburn and Dr. Calvin Harley, one page mentions how numerous studies have documented over time telomeres can lengthen, and "seem" to be "responsive to lifestyle changes." However, it doesn't make these lifestyle changes explicit. although Dr. Blackburn has done several studies linking stress to lower telomere length, so she probably at least advocates lowering stress. Their company seems to be about marketing easier ways to measure telomeres.

According to a study by Dean Ornish et al, three months of "comprehensive lifestyle modifications" resulted in increased telomerase activity.

They studied 24 men who already had low-risk prostate cancer, and got them to eat less refined carbohydrates and a lot more fruits and vegetables, walk 30 minutes per day six days a week, spend an hour a day in stress management (yoga, breathing, meditation, imagery) and take supplements (tofu plus soy-powdered protein, fish oil, selenium, vitamin E and vitamin C).

As to be expected, three months of this proved beneficial to the subjects in other ways:

Decreases in both systolic and diastolic blood pressure

Improved lipid profile

Reduced body mass index (BMI)

Reduced waist circumference

Lower C-reactive protein

Fewer psychologically stressful "intrusive thoughts"

Decreased LDL-cholesterol

Therefore, although the discovery of telomeres and telomerase is tremendously important, so far the research demonstrates standard good and bad health practices are re-affirmed, not changed.

With one exception.

What if we can take a pill to help activate telomerase in our somatic cells?

Chapter Nine

Supplement to Activate Telomerase—TA-65

Nontechnical chapter summation: TA-65 is a supplement proven to increase telomerase in humans. It's hoped that means it will extend the life spans of people who take it.

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In 2002 Noel Patton obtained the exclusive worldwide rights to Geron Corporation's Telomerase Activation technology for non-prescription nutraceutical and cosmeceutical use. After 5 years of development and safety testing, he started T.A Sciences. They now sell TA-65®, which has been used since 2005.

The only way—proven by human clinical trials conducted by both The Geron Corporation and Sierra Sciences—to activate telomerase in the human body is with a molecule named Telomerase Activator (TA) 65. That's the TAT2 molecule found only in small amounts in certain species of the Chinese herb Astragalus in only a small area of China, discovered by The Geron Corporation.

In the T.A. Sciences study 114 people took 5 to 10 mg a day. Some went up to 25 or 50 mg a day without sign of any adverse effects.

They were studied and tested at the beginning and at three-month intervals through the year.

According to Calvin Harley, "Those data showed TA-65 activates telomerase roughly 2- to 3-fold."

The percentage of immune cells with short telomeres went down about 10% to 50%, and the number of aged immune cells went down about 10% to 20%.

Astragalus has been used in Traditional Chinese Medicine for who knows how many thousands of years, and can be found in health food stores around the world.

However, it's not likely TA-65 is responsible for any health benefits of Astralagus the herb, because it's present in the natural herb only in very small amounts. It takes three tons of Astragalus to produce a 5 mg pill of TA 65.

Therefore, although Astragalus or an astragaloside product may benefit your health in other ways, it won't lengthen your telomeres.

To affect the length of your telomeres, you need a highly concentrated form.

T.A. Sciences isolates TAT2 molecules from Astralagus into a strong, pure extract free of heavy metals, pesticides or other toxins.

TA 65 is being marketed as a supplement, not a drug, so T.A. Sciences makes no claims it can cure any disease. Everybody employed there over the age of 40 takes their product.

The hope is simply—by lengthening telomeres—TA 65 can extend healthy lifespan. In effect, putting off the onset of age-related diseases. Just keeping the immune system strong would help to do this naturally.

Other Telomerase Inducers on the Way?

One of their customers is William Andrews, who has worked on telomere biology for over 15 years, including at Geron. He is the chief executive officer of Sierra Sciences, LLC, a T.A. Sciences competitor looking for their own telomerase inducer.

Sierra Sciences has found 858 substances which induce somatic human cells to express telomerase, but so far, none of them are strong enough to bring to market.

Dr. William Andrews and T.A. Sciences obviously cooperate. T.A. Sciences hosts his ebook on telomerase:

Curing Aging

T.A. Sciences recommends you take TA 65 as part of what they call the Patton Protocol. That includes buying six months at a time, to avoid the problem of people taking it for only a month or two, not obtaining immediate results, and then stopping. They acknowledge it may take up to six months before you feel different.

The Patton Protocol also involves testing of blood and biomarkers prior to taking TA 65, and periodic testing while on it. These tests naturally add to the total cost of the TA 65 program.

TA 65 itself is considered the beginning, not the end. A study has documented people taking it have their short telomeres lengthened, and they have reported many health and anti-aging benefits, but it's not strong enough to be the magic fountain of youth.

I have seen other substances trying to jump on the telomerase bandwagon, including: Reneuve, CGK733, Telezyme and IsaGenix Product B, but so far TA-65 is the only one proven by human trials to activate telomerase.

Be suspicious of any others you see. See if they have run human trials. See if they are connected to the three companies leading this technology: Geron, T.A. Sciences and Sierra Sciences.

According to one source, some substances may be subkeys which help encourage telomerase. These include tocotrienols and Carnosine.

Chapter Ten

TA-65 and the Risk of Cancer

Nontechnical chapter summation: Some fear that increasing telomerase in human bodies increases their risk of getting cancer. The current consensus is cancer activates telomerase —telomerase doesn't cause cancer. However, it remains a concern.

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There's no doubt telomerase enables malignant cells to continue multiplying and dividing past their ordinary life span, so they endanger our bodies.

Does that mean increasing the supply of telomerase in our bodies would place us at greater cancer risk?

That is a possible, but probably overly simplistic, risk.

The Geron Corporation states its experiments show when telomerase is introduced to senescent cells telomeres are lengthened so the cells return to active functioning—and that does not make them cancerous.

They also state cancer causes telomerase to be abnormally activated in cells, allowing the cancer to grow without limit.

They are working on developing anticancer drugs which are telomerase inhibitors, and also telomerase therapeutic vaccines.

Titia de Lange and Hastie's group reported in 1990 telomeres in human tumors were shorter than telomeres in the normal surrounding tissue.

Studies were done by Greider's, Bacchetti's and Harley's laboratories where they induced normal cells to ignore the ordinary biochemical signal to stop dividing. They kept on dividing at a rapid, uncontrolled rate. This therefore reduced the size of their telomeres. In most of these cells, there was no telomerase, and they died of premature old age.

However, some cancerous cells find ways to activate the gene for telomerase. This can happen in different ways, including:

Gene application
Mutation
Repression
Recombination
ALT Mechanism

Apparently telomerase can enable out of control cell division in cells which are already undergoing that process and which have reached the point at which their telomeres are very short.

So if cells do not already exhibit out of control cell division, the presence of telomerase does not begin the process.

This seems to imply several things:

1. The "cause" of the cancer is not the telomerase but whatever damage or erroneous signaling within the body prompted the initial cell abnormality.

2. Cells synthesize telomerase only after they have been replicating out of control and their telomeres are short. It does then stabilize them.

It's also true if you can keep the telomeres of the cells of your immune system relatively long, and strong in other ways, they normally are good at detecting and destroying cancer cells long before they become a health problem to you.

The study by Dean Ornish et al demonstrated lifestyle improvements helped increase telomerase activity in men who already had low-risk prostate cancer.

Embryonic stem cells express telomerase, and they are not malignant, anything but. Also, immune system cells and reproductive cells manage to have telomerase without being malignant.

Mice with high levels of telomerase have a higher incidence of cancer. However, strains of mice resistant to cancer have longer life spans if given telomerase.

And it's not certain how much this corresponds to aging and telomerase in people.

It's also a fact in people cancer is correlated with short telomeres. 79% of all cancers occur in people over the age of 58.

In December 2010 Journal of American Medical Association published a study showing short telomeres increased the risk of cancer 4-5 times.

A research team at Harvard discovered short telomeres doubles your risk of bladder cancer. Japanese researchers found cancers of the mouth begin in cells with short telomeres.

Therefore, having longer telomeres is clearly not a risk for cancer, but seems to help prevent them, either through strong immune system functioning or telomeres protecting the integrity of the cells' DNA.

In fact, by enabling overall better health and youth in your body, it may very well help prevent cancers from beginning.

Another Potential Risk

A researcher found telomerase active at the site of blockages in coronary artery tissue. Therefore, telomerase could help create blockages that cause heart attacks.

Conclusion

In the end, of course, you must decide for yourself whether you wish to try out TA-65.

That's assuming, of course, you can afford it. Obviously, not everybody can cough up from $12,000 every year, even for immortality.

However, let's put that in perspective. Many high quality health supplements cost between $30 - $100 now, and many people take more than one. Some of us take five to ten. I for one would take at least that many if my budget allowed it.

First there's a multi-vitamin, then a multi-mineral, a male/female specialty supplement, high quantity Vitamin D, mixed tocopherals or Vitamin E, fish oil or other Omega 3 product, an eye supplement for those of us with aging eyes, a joint supplement for people with pain

in their joints, various antioxidant supplements including Vitamin C, and a range of phytochemicals from Resveratrol to theanine and EGC. Add herbs, superfoods, enzymes and weight loss products.

It's amazing how many quality supplements are available.

I have no doubt some dedicated health "nuts" who are affluent enough, already spend $1,000 a month and more.

You can benefit from the research simply by modifying your lifestyle to encourage your body to synthesize more telomerase—and simply by avoiding premature shortening of your telomeres.

How healthy is your current lifestyle? There's not much point of spending $1,000 per month on one supplement if you still smoke, or drink too much, or overeat a lot of junk foods, or refuse to exercise.

T.A. Sciences does not promise TA-65 is any kind of miracle worker. It can slow down or even reverse the shortening of your telomeres, but not if you spend most of your day doing things that shorten them.

If you're not already taking a quality multivitamin, 2,000 5,000 IU of Vitamin D, Resveratrol, and other important antioxidants, there's not much point in taking TA 65 even if you have the funds. Take at least 4,000 milligrams of fish oil or other Omega 3 supplement every day.

First, see how much your health can improve by taking other supplements, eating better, exercising moderately and getting eight hours of sleep every night.

Look at this way…I'm sure you realize telomerase cannot protect you from someone firing a bullet into your brain. Obviously that's beyond the power of any supplement outside of comic books.

Psychological stress, excessive free radicals, lack of exercise, lack of good nutrition, inflammation, and other problems are also threats to your health. Taking TA 65 won't make any of them go away. Protect yourself in every way possible.

By all means, consult your doctor. Consider your age and the current state of your health.

If history is any guide, the price will come down soon, and competitors will come on the market.

Sierra Sciences and possibly other biotech companies are working overtime to find more effective (alone or in combination) telomerase activators.

In one of the videos I cite in the Reference section, Dr. Andrews outlines his plan to discover a true "immortality" drug within ten to fifteen years.

That is good news for those of us who wish to stay young for a very, very, very long time to come.

It's now our job to stick around long enough to benefit from future discoveries.

Resources

T.A. Sciences

Sierra Sciences

The Geron Corporation

Telome Health Inc

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