



SUZANNE  
SOMERS

# BOMBSHELL

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THAT WILL REDEFINE AGING



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HEALTH-DISEASE

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## CHAPTER 10

### **BOMBHELL #6: A SUPPLEMENT MAY HOLD THE SECRET TO EXTREME LONGEVITY**

A bulldozer of change is charging over the planet, and if you're not part of the bulldozer, you'll become part of the road.

—Frank Ogden, futurist

**Telomeres and telomerase**—these are two words that will change the way you age!

So it's only fitting that they are the next Bombshell I'll introduce you to. There is a new supplement that may turn the medical world on its ear. It works by lengthening your telomeres, which appear to be the key to the fountain of youth. And best of all, the supplement that does this work is all natural.

Telomere therapy won't change the speed of cellular aging: it will just change the number of years it takes for your body to grow old.

—Michael Fossel, Greta Blackburn, and Dave Woynarowski, *The Immortality Edge*

Throughout history, man has been searching for the secret to immortality and now, spectacularly, scientists have unraveled the mystery specifically pinpointing the premier *cause* of aging! This is science at its best and it earned researchers Elizabeth Blackburn, Carol Greider, and Harvard geneticist Jack Szostak the Nobel Prize for developing an enzyme that can actually *reverse* aging. They called the enzyme “the little engine that could.” That enzyme, called *telo-*

*merase*, determines a cell's ability to regrow or lengthen *telomeres*, which are the essence of life. Simply put, aging happens and accelerates with the loss of telomeres.

What exactly is a telomere? Here's the textbook definition:

Telomeres are a short repetitive segment of nongenetic material that functions as a biological clock to determine the life span of a cell (meaning how many times the cell can reproduce before it dies). The telomere is also intimately involved with stabilizing the genetic material and is thus directly involved in the health of the cell and the entire organism.

Huh?

In lay speak, telomeres are the tails on the ends of our chromosomes. Each cell in our body has approximately fifty replications. Every time a cell replicates itself, the "tail" (telomere) gets shorter. By the time the cell has replicated fifty or so times, the tail is nonexistent and then the cell dies. We have over fifty trillion cells, and the process of dying cells is called *senescence*. Senescent cells promote the progression of age-related diseases, including cancers. Senescent cells in our skin make us look withered. In our immune system, they make us susceptible to the diseases of aging such as heart disease, heart failure, diabetes, and overall fragility; and even if we are lucky enough to avoid these conditions, eventually so many of our cells will be in a state of senescence the body as a whole will no longer be able to sustain itself. When that happens, we die of "old age."

The good news is that science, thanks to the Nobel Prize winners mentioned above, has found a way to reverse senescence. Around the mid-1970s, scientists were in general agreement that both ends of every chromosome contain relatively long strands of "junk" DNA called telomeres, and the primary function of these telomeres appeared to be to protect the DNA. So when chromosomes divide and multiply, instead of losing the DNA that matters, they lose only some of the telomere's DNA. With every replication of our DNA, part of the telomere sequence is chopped off. This is how nature protects the DNA in a chromosome. When cells divide and multiply, it is very important that the DNA in the chromosomes remains intact; otherwise, genetic defects can occur, some not so serious and others very serious (like causing cells to become cancerous).



To understand the importance of telomeres, let's look at those with the disease called *progeria*. You may be aware of children who are born "old." Those with this disease have short telomeres. They age prematurely and, sadly and shockingly, wither and die in a very short time. Shorter telomeres correlate with age and the state of your health. In a study of 780 patients with stable heart disease, people with the shortest telomeres in their immune cells had twice the risk of death and heart failure after 4.4 years compared to the patients with the longest telomeres.

As telomeres shorten they are like ticking genetic clocks in your cells. As you age and telomeres shorten, they cause certain of the body's systems to shut down. The systems that repair damage and keep your metabolism regulated have a drastic effect on aging once removed from action. Some of the key systems affected by diminishing telomeres are your endocrine system (in charge of releasing hormones, crucial to youth) and your all-important immune system. In addition, once some things are damaged, they can't be repaired very well, such as certain organs and joints and, of course, damaged cells.

Telomere length has been implicated in almost all aspects of normal aging. High levels of stress hormones, inflammation, insulin issues and high blood sugar, as well as habits and conditions such as smoking, poor diets, obesity, and sedentary living are all linked to shorter telomeres and lower telomerase levels. Cancer, atherosclerosis, Alzheimer's, osteoarthritis, osteoporosis, macular degeneration, cirrhosis of the liver, and AIDS are all related to having shorter telomeres.

Sperm cells divide millions of times and their telomeres never get short, because when you add the enzyme telomerase, it adds telomere DNA back to the cell's telomeres and keeps those telomeres as long as they have always been. That's why an old man can still father children. Again, nature is perfection and always has the perfect plan.

Aging well requires planning, and now you can add another tool to your kit; it is a new, sophisticated nondrug way of lengthening your life that allows you to remain healthy and vital while also maintaining your "edge." This new discovery just might make aging the enjoyable experience it should be. This advancement may extend life, and those presently using it enthusiastically report that they feel and look better. Results differ, but some say they notice those things that



bug most aging people, like bad eyesight, hearing loss, stringy hair, brittle nails, sagging skin (have you noticed that suddenly your skin doesn't "fit" anymore?), all improve with it. If you have a magnifying mirror, you know there are days when you want to jump back in horror. Yipes! Who is that, you ask? Unfortunately, these changes in your appearances are manifestations of internal deterioration. To date, there has been little you can do about it.

Disease, unfortunately, is also part of the present template of aging. We "expect" we will be brought down by one of the big three—Alzheimer's, heart disease, cancer—and now add to them environmental diseases, which are so rampant.

But science has a plan . . .

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THE DISCOVERY OF TELOMERASE IS THE MOST EXCITING  
NEW ANTIAGING DEVELOPMENT OF THIS DECADE,  
AND IT IS AVAILABLE RIGHT NOW!

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Because of the amazing work of the Nobel Prize winners Carol Greider, Elizabeth Blackburn, and Jack Szostak, it is now possible to extend your life expectancy beyond 100 years to 120 years or more, while leading an active, robust, independent lifestyle, maintaining all the strength and vitality you had when you were much younger, and again, without the use of drugs.

Imagine being a centenarian looking half your age, playing outdoors with your great-great-grandchildren, dancing with much younger partners, enjoying new hobbies and pursuits, and, yes, still having a great sex life. All without having to worry about life-threatening conditions like cancer, heart disease, diabetes, chronic infections, dementia, poor eyesight, hearing loss, low energy, and other miserable conditions that plague too many older people. Imagine!

The paradigm of aging is changing. Rapidly.

The scientists who discovered telomerase realized that this enzyme provided a germ cell with an unending ability to reproduce itself. They found that telomerase keeps DNA tightly wound so the cell is not subject to the normal wear and tear that other cells in the body are subjected to; consequently, they proved that reproductive cells



don't lose telomere length as we age. Why? For the same reason babies are born with telomeres that are long rather than short like those of their parents. Clearly human biology is about perpetuation of the species.

Long telomeres, long life!

So obviously, you want to figure out how to keep your telomeres longer.

This new advancement comes with a hefty price tag, so if it's not affordable to you, there is evidence that fish oil, vitamin D and multivitamins, and healthy lifestyle choices may slow the rate of telomere shortening as well. This helps explain why people who take care of themselves and use the proper supplements enjoy such profound health benefits.

The key to extreme longevity is turning the telomerase gene from "off" to "on"!

—Michael Fossel, Greta Blackburn, and Dave Woynarowski, *The Immortality Edge*

### TA-65: THE ENZYME THAT PROVIDES A FAR BETTER WAY TO AGE

T.A. Sciences, in New York City, has created a supplement in pill form that the company claims has been lab tested and shown to *turn on telomerase and lengthen the shortest telomeres!* This is critically important because it takes only one short telomere to send a cell into crisis.

The makers of this supplement can't stop talking about it. They report "new skin," a clear and visible smoothing and "reverse aging" of the skin. Others report improved vision and hearing, shinier hair, and stronger nails.

The product is called TA-65. It contains a single molecule from the astragalus plant, which has been used in Chinese medicine for thousands of years, often in combination with other herbs to strengthen the body's immune system. TA-65 is the *only* telomerase activator that is available right now. T.A. Sciences purifies the rare and expensive substance through an extensive process that also factors into



its high price, which begins at around \$2,000 a year. Hopefully, as people start using it the price will come down . . . Read Noel Patton's section that follows on this exciting supplement, then review Dr. Andy Jurow's interview, as he is a prescribing doctor for it. Both Mr. Patton and Dr. Jurow are beyond excited, and I have to say those I've spoken with who are using it are ecstatic. The theory behind TA-65 is beyond making you look good; it's about the possibility of reversing aging by releasing the enzyme telomerase. This is a major Bombshell to hit the antiaging world, and Noel Patton has brought this supplement to the market. Read what he has to say.

## NOEL THOMAS PATTON OF T.A. SCIENCES

**Noel Thomas Patton** is a businessman, a visionary, and an entrepreneur. He is the founder of T.A. Sciences and responsible for bringing TA-65 to the public. A graduate of Indiana University (1969) with an honors degree in philosophy, Noel furthered his studies on the East Coast and is an alumnus of the Harvard Business School. His interest in telomere biology began in 1999, when he heard a lecture that explained how an enzyme called telomerase had the potential to rejuvenate human cells and keep them from dying of old age.

*The importance of telomerase for changing the way we age was emphasized in 2009 when its discoverers won the Nobel Prize for medicine.*

**SS:** Thank you for your time, Mr. Patton. You own the company that makes the incredible new supplement TA-65. Can you give me your explanation of how it works and why this is so revolutionary?

**NTP:** Thank you, Suzanne. What we are talking about today is telomere biology and how our product TA-65 can lengthen telomeres, and what that means in our quest for life extension. Telomeres are the ends of the chromosomes. We have 23 pairs of chromosomes in every cell in our bodies; 23 from your mother, and 23 from your father and all the genetic material is on those 23 pairs of chromosomes in every cell.

**SS:** In other words, it's who we are?

**NTP:** Correct. It's critically important that the genes on those chromosomes are kept intact and in good health. At both ends of every chromosome are sequences of DNA that are not like other genetic material and these are the telomeres.



**SS:** These are the little tails on the ends of the chromosomes?

**NTP:** Correct. They act as protective tips at the ends of the chromosome to protect the integrity of the genome, like the plastic tips at the ends of shoelaces. One of the most important scientific discoveries of the last twenty years was learning that these "ends" act as the aging clock for nearly every cell in our bodies, because every time a cell divides, the ends (telomeres) get shorter. When they get to certain critical shortness, cells can no longer divide and they become senescent (nonfunctioning/sick) and then die. For the cell, this is a crisis, like falling off a cliff. But there is a long downward spiral before this crisis happens. This telomere shortening is what is driving the aging process. Changes in telomere length signal certain genes to either turn on or turn off. This is called *changing gene expression*. Which genes are turned on and which ones are turned off is what dictates the functionality of the cell; this is the fundamental aging process.

**SS:** Like a shutdown. Little by little the functions give out on us.

**NTP:** Right, so even before your telomeres get so short that the cell no longer functions or dies, along the way, telomere attrition is causing aging of the cells. This is consistent with recent studies by Dr. Ronald DePinho when at Harvard that showed telomere shortening to be one of the root causes of aging.

In November of 2010, Dr. DePinho published an important paper in the scientific journal *Nature* where he showed for the first time in history that the aging of a mammal was reversed. Notice that we are not talking here about life extension; we are seeing actual *age reversal*. He started out by engineering mice that had no telomerase to be the equivalent of eighty-year-old humans, and then he activated telomerase in those mice.

**SS:** Again, you are speaking of the enzyme that is responsible for *lengthening* telomeres.

**NTP:** Correct. So when Dr. DePinho *added back* the telomerase to these eighty-year-old mice, they essentially became young adults again.

**SS:** As you say this, I'm thinking that throughout history humans have been searching for the elusive fountain of youth . . . is this it?

**NTP:** We are not there yet, but we are on the right road. Telomere biologists have a lot more work to do, but we are having very significant results. I got interested in telomeres more than ten years ago because I was an aging human being and I didn't like it. And now ten years later, we are seeing real results in human beings like me. I

don't have all the answers on this very complex subject of aging, but aging clearly correlates to a shortening of telomeres, and it's becoming more and more apparent that this telomere shortening is one of the fundamental causes. So, personally, I agree with Dr. DePinho that a lack of telomerase, which causes the shortening of telomeres, is the root cause of aging.

We can take a human cell in a petri dish and by activating the enzyme telomerase, we can make that cell immortal.

**SS:** What do you mean by "immortal"?

**NTP:** By immortal, I don't mean in the religious sense, but that the cell won't die of old age as long as you keep feeding it and keep the telomerase gene activated so that the cell can continue to keep making its own telomerase.

**SS:** So is this telomerase something you can inject or put in a pill?

**NTP:** No, it's made inside the cell, and TA-65 turns on the gene that makes it, which normally is turned "off" in almost all cells of an aging person. Going back to your "fountain of youth" question; the idea is not entirely science fiction. If you activate telomerase within each cell and keep it activated, then, yes, we may be able to make those cells immortal.

**SS:** That takes my breath away.

**NTP:** There's a lot more we have to do and know about. Also, as far as expecting a miracle, you have to remember that it took us a long time to get to the age we are now, so you are not going to regress overnight.

**SS:** Okay, I'm breathing again. [Laughs.]

I interviewed Dr. Andy Jurow for this book. He is an antiaging doctor in Burlingame, Northern California, and is certified to prescribe your supplement. He and his wife have been taking your supplement TA-65, and they are talking about amazing skin changes—smooth, young skin . . . noticeably so. My sister ran into them in downtown Burlingame and was blown away by how different they both looked. He also reported that his eyesight was better, and both say their hair is looking better. I feel that skin and hair are good indicators of interior health.

**NTP:** The results vary with different people. My eyesight has gotten better since taking TA-65, but my hair has not gotten darker, although it looks healthier and plentiful.

**SS:** How long have you been taking it?

**NTP:** I've been taking it for four and a half years. When I turned



fifty (I'm sixty-five now), I started to notice the effects of aging and, like I said, I didn't like it: stiff joints, low energy, and so on. So I started looking into antiaging medicine strictly to help myself. In that process, I heard a speech by Dr. Jerry Shay, a professor at the University of Texas Southwest, who talked about telomeres and telomerase and how it was possible to immortalize human cells.

After his talk, I asked the professor where I could get some of this immortalization stuff. He laughed and said his university had licensed all their patents to a company called Geron in Menlo Park, California, and that they were developing this technology for telomerase activation. The very next day I called the CEO of Geron, flew out to meet with him, and ended up investing in the company through a private stock placement. That investment helped to finance the development of what we now call TA-65, and later I licensed all Geron's telomerase activation technology for nutraceutical and cosmetic applications.

**SS:** Why wouldn't Geron have kept this license for themselves? I mean, they are a giant pharmaceutical company.

**NTP:** They ran into some financial constraints at that time. They had a lot of good science, but not enough money to properly develop all of it and had to decide what to emphasize and which to cut back on . . . they decided to eliminate telomerase activation and instead went forward on cancer drugs. Today, I think Geron is surprised and probably regrets having given me the license for TA-65 and all their telomerase activation technology.

**SS:** Does TA-65 cure disease?

**NTP:** Even if we did studies proving TA-65 cured or prevented diseases, we would not be able to make those claims because we are selling a nutraceutical and not a drug. To make any disease claims, you have to go through the full FDA drug approval process, which can take up to ten years and cost hundreds of millions of dollars. I don't have that kind of money and even if I did, I would not want people to have to wait years to be able to take TA-65. We are helping a lot of people right now and very glad to be able to do so.

Geron on its own has been pursuing research for drugs that are telomerase activators. There is definite reason to believe that telomerase activation can be beneficial in a number of disease states, and Geron, which is a drug company, has kept those rights for itself. A few years ago the company announced it was developing a drug for HIV AIDS, which is actually a telomere-shortening disease that

wears out your immune system. What happens is that the immune system senses that the HIV virus has gotten into CD4 immune cells, and certain other "killer" immune cells then attack those infected cells. The immune system keeps fighting this virus until the immune system becomes "worn out." When that happens, immunologists believe that a person goes from being HIV positive into having full-blown AIDS. As you know, AIDS stands for acquired immune deficiency syndrome. The reason the immune system wears out is because the killer cells keep dividing to fight the virus, and every time any cell divides, its telomeres get shorter. When the telomeres get too short, the immune cells can't divide anymore and you end up running out of immune cells.

**SS:** Well, I imagine the only reason a drug company would pursue a product with the hopes of curing a disease is to get FDA approval and sell it as a drug. They are not normally into supplements, which I imagine is why they gave you the license. Lucky you.

**NTP:** Yes, they are going for the drug or drugs that cure or assist in disease management. They can then apply for a patent and own the discovery.

I am involved because I got interested in the antiaging effect of TA-65, the thinking being that if you don't age, you won't get the diseases of aging.

**SS:** It's a theory that makes sense. It certainly has me intrigued. My inclination would always be to go for the nondrug first.

**NTP:** Yes, but you are not the average person. You are much more informed and knowledgeable about medical advances. The average person who gets sick goes to his doctor and the doctor tells him what to do and he does it.

**SS:** Just like they are children! And why not; we've been trained to think of doctors as gods. I remember my mother would never dare question a doctor. But that thinking has got to change because no one is going to care as much about your health as you, and with toxicity and environmental diseases at epidemic proportions, you have to be the one who is in charge of your own body. In that sense I definitely am different. I have my own ideas of what old age will look like, and it's a very nice picture. I think my doctors like that I am informed. That's why I write my books—so people have the information, so they can start connecting their own dots to their health. I believe doctors should actually be thought of more like mechanics you hire to fix your body. That attitude would get you better service. When you take your



car in to the mechanic, you are not afraid to ask a lot of questions; you want to know what they are fixing and why and how. Right? I mean, after all, it's your car. And in this instance, it's your life!

**NTP:** Absolutely.

**SS:** How do you take TA-65?

**NTP:** I take a full dose of four capsules a day, two in the morning and two in the evening. One of our doctors, Dr. Ed Park, recommends that people take all four at the same time and in the evening. We offer three daily dose levels varying from one to four capsules; low, medium, and full.

**SS:** I met with Dr. Park and was amazed by his transformation since taking TA-65. He showed me a picture of himself ten years ago, overweight and looking much older than the way he looks today. He makes the same claims: more hair, tremendous weight loss, energy, vitality, and better lung capacity. It was quite remarkable.

Do you take different amounts of TA-65 depending on your age?

**NTP:** Generally, yes. If you are under fifty, take one pill a day; if you are from fifty to sixty-five, then take two; and if you are seventy or older, we recommend the full dose of four a day. But if you know the length of your telomeres, these age guidelines are not applicable. One person we tested was twenty-five years old, but her lab results showed that her telomeres were that of a fifty-year-old. Because of this we have given her two daily tablets, and she seems to be benefiting from it.

**SS:** What caused her to age so rapidly?

**NTP:** She had a tremendous amount of stress in her life, both emotional and physical; she had various disease problems along with severe emotional distress.

**SS:** So in her case it is not only life extending, it appears to be lifesaving.

**NTP:** Hard to tell at this point if it is life extending. Even with the telomeres of a fifty-year-old, at twenty-five she could still easily live for another forty years. Forty years from now would mean she might end up dying at sixty-five instead of living on into her nineties. At present, it is impossible to get statistical information on actual human life extension.

We recommend that everyone have their telomeres measured, but it's not always necessary. If you are seventy years old, all I have to do is look at you and I know you are not forty anymore. Forty is the age when everyone should start to do something about their telomeres.

**SS:** We measure our telomeres by taking a test. What are these tests? Is it the telomerase chain reaction test? The PCR test?

**NTP:** There are now three different commercially available tests that measure the length of telomeres; this way we get a baseline. SpectraCell is a U.S. lab doing it, and there is a company in Canada called Repeat Diagnostics; both of these companies measure the mean (or average) telomere length.

There is also a third company, called Life Length, formed by María Blasco, head of the Spanish National Cancer Research Institute in Madrid, Spain. Life Length has a more expensive test, but it can measure the shortest telomeres. This test has recently become available in both the United States and Europe.

Ideally, people taking TA-65 should do a test that measures the shortest telomeres. It only takes one cell with short telomeres out of the ninety-two telomeres in every cell to send it into crisis (apoptosis), which is programmed cell death.

There's another company called Telome Health in Menlo Park, California, formed by Professor Elizabeth Blackburn, the Nobel Prize winner who discovered telomerase, and Dr. Calvin Harley, who was the chief scientific officer at Geron. They are currently only doing work for academic institutions, but by the time this book is published, they expect to be doing testing for the general public. It will be interesting to see exactly what tests and pricing they will offer.

#### TESTING FOR TELOMERES

The standard test to measure your telomeres is called a *polymerase chain reaction test* (PCR test). It is a blood test done by SpectraCell labs in Houston and costs around \$350. This test can determine the median length of your telomeres in relation to your age. The supplement must be prescribed by a qualified certified doctor, and the supplement itself can be obtained from MedQuest in Salt Lake City.

There is a gene called the *hTERT gene* (the "h" stands for human). This gene gets gradually turned off in normal aging. By the time we are adults, the hTERT gene has been turned off in almost all the normal cells in our bodies. We at T.A. Sciences want to turn it back on. TA-65 is able to turn on hTERT genes in healthy cells.

Cancer is caused by a series of mutations that cause the cells to lose growth control. These bad cells would soon die from telomere shortening, but they stay alive because the hTERT gene gets turned



on full blast and they are able to continue to divide indefinitely because they are telomerase positive. But TA-65 does not turn on the gene in cancer cells; it is already turned on by a mutation—a mutation that may in fact be caused by telomeres getting critically short.

To illustrate that telomerase itself does not cause cancer, let's look at some healthy cells that also have telomerase turned on full blast: our germ line cells. These are our reproductive cells, eggs and sperm. Telomeres do not get short in reproductive cells because babies have to be born with baby-length telomeres, not the shorter telomeres of their aging parents. So the fact that you have that gene turned on all the time in healthy cells like eggs or sperm is a good thing. Telomerase simply allows cells to stay young and live longer; it doesn't make them cancerous. While people get testicular and ovarian cancer, no one ever gets egg or sperm cancer.

As I have said, turning on telomerase makes cells younger and extends their lives, and we want to do just that for the fifty trillion aging cells in our body.

Another point: TA-65 rejuvenates the immune system, and a strong immune system fights cancer. We have thousands of people taking our supplement and we have not heard of even one person coming down with cancer after starting to take TA-65.

**SS:** So TA-65 can rejuvenate and strengthen an aging immune system. Seems it's worth it if only for that.

**NTP:** To back up this theoretical argument, we and others have done in vivo studies and found that TA-65 did not accelerate cancerous growth or cause increased initiation of cancers.

**SS:** Going back to the importance of strengthening the immune system, has there been any clinical testing?

**NTP:** Luckily for us, strengthening the immune system is not considered a disease treatment by the FDA, so we can honestly tell people that taking TA-65 rejuvenates the immune system. We are also proud to report that there are several scientific studies on TA-65 that have established both efficacy and safety. One of them was published in 2011 in the English journal *Rejuvenation Research*. That trial showed that the shortest telomeres got longer in people taking TA-65 and their immune systems were rejuvenated. There were other good health benefits associated with TA-65 that are currently under study as we speak. We will have to talk again to update your book once those results are published.

If we do not get hit by a bus, all of us will get some form or fashion

of a disease. It is just a part of getting older. However, supporting cellular health and the immune system should go a long way in contributing to our overall health and longevity.

**SS:** Well, I see this supplement as a step toward health and away from the present dismal aging paradigm.

**NTP:** That's the whole point of our business. The TA-65 molecule is found in the astragalus plant. It's a very rare molecule. We spent five years testing for safety and developing the technology for extracting and purifying it before we introduced it to the market for human consumption. Even though it's an extract from a plant, what we end up with is a single molecule. It's not a normal extract. There are more than 2,000 molecules in the astragalus plant and we take out the other 1,999 so there's only one left.

**SS:** Does one take TA-65 for life?

**NTP:** I will. But it's not like the hormones that you write about so eloquently. As you know, with hormones, once you start taking them you have to take them for life or you go right back to where you started. That's not the case with lengthening your telomeres. Here is a hypothetical example: If I take TA-65 for a year, and I lengthen my telomeres the equivalent of ten years and then I stop, my telomeres won't immediately go back to where they were when I started. They will start to age again, but it should take ten years to get as short as they were when I started.

**SS:** I see; it's like rolling the clock back.

**NTP:** Exactly. If you take TA-65 for one year or even six months, you'll get a benefit and that benefit will last.

**SS:** Will I notice a difference right away?

**NTP:** Not necessarily. Some people do and some don't. A major effect of TA-65 is rejuvenation of the immune system. But how do you know if your immune system is stronger? You don't necessarily feel any different at all; you would need a series of blood tests to track changes.

Similarly, how do you feel if your telomeres are longer? You don't feel that, either. It's a long-term lengthening of the telomeres that's going to have the effect. But a lot of people do notice things like sleeping better, having more energy, better sexual performance, and so on.

**SS:** Who is taking it?

**NTP:** I'm not at liberty to name names without specific authorization, but I can say this; we have Nobel laureates, famous actors

and actresses, professional athletes who are trying to prolong their careers, and a lot of people who are simply not willing to be packed off to the nursing home.

**SS:** So you are making cells young again. It's actually a fantastic dream. Can any doctor prescribe it?

**NTP:** No, we only sell through doctors and health professionals who we have licensed. There are more than 250 in the United States and more are being added each week. To be licensed by us, health professionals have to pay a licensing fee, sign a legal document, study our fifty-page manual on telomerase activation, and, finally, pass a written test. Only then will we certify them. TA-65 is not just another supplement; it addresses the fundamental root cause of cellular aging. We don't want it sold by anyone who doesn't understand at least the basics of telomere biology.

**SS:** Is there a resource list so people from all over the country can access one of these doctors?

**NTP:** Yes, all our licensees are listed on our online website: [www.TASciences.com](http://www.TASciences.com).

**SS:** And how much will this cost?

**NTP:** For older people or those with short telomeres who take the full dose of four pills a day, it costs about \$4,000 for a six-month supply. If you are younger and need a lower dose, it will be less. The low dose of one pill a day costs \$200 a month. That's not too bad; many women spend more than that for cosmetics.

**SS:** Not everyone will see the same results. What complaints have you gotten?

**NTP:** Well, the worst case that I can think of was not actually so bad. We had an eighty-year-old client who took TA-65 for two years and then we noticed he had stopped reordering. So I called and asked him why. He said, "Well, I've been taking it for two years and I don't think it's doing me any good. I feel exactly the same as I did before I started taking it." I then said to him, "John, you've gone from eighty to almost eighty-three with no deterioration, feeling exactly as you did before; don't you think that may be a benefit in itself?" He said he hadn't thought of that, and then he said, "Actually, come to think of it, I haven't been feeling as good as I was when I was taking TA-65 every day." So I said to him, let's retest you and objectively see what has happened. Luckily, he had done blood work to establish a baseline before he started taking our product so we could make a comparison. He took a follow-up blood test and we found that his



immune system had quite significantly improved so he went back on the supplement.

**SS:** How does TA-65 affect stem cells?

**NTP:** Stem cells are like every other human cell in that every time one divides, the telomeres get shorter. But they are different from most cells because they have some telomerase, which is why they can make enough new cells to keep us alive. Unfortunately, when stem cells get old, they can't produce enough telomerase anymore, and their capacity to make new cells decreases. The result is obvious; we lose regenerative capacity and eventually succumb to old age. But TA-65 activates telomerase in all types of cells we have studied, and we expect it is active in stem cells as well, keeping them functioning longer.

We are talking to stem cell people who multiply stem cells in their labs with the idea of using TA-65 so that all that cell division does not end up severely shortening telomeres. Clearly it is not a good idea to put back stem cells that are older than they started with, and that's what happens when cells divide if they don't have telomerase activated at the same time. I would like to see stem cell therapy one day using adult cells that in addition to having been multiplied have been made younger.

Let me say a few words about telomere lengths over the course of a lifetime. Did you know your telomeres are the longest at conception, not at birth? Remember that every time a cell divides, your telomeres get shorter. When we start out as an embryo, we consist of only one cell. Then that single-cell embryo starts to divide. By the time a baby is born, the cell numbers have increased billions of times to get all those cells to make a fully formed baby. Telomeres in an embryo start out being about 15,000 base pairs of DNA long, and by the time the baby is born, telomere length is down to about 10,000 base pairs. We all lose about one-third of our telomere length by the time we are born. Over the next eighty or so years, we lose another 5,000 to 7,000 base pairs. Then when a telomere gets down to about 3,000 (it doesn't have to get to zero), it's too short to do its job of protecting the chromosome. You get double strand breaks and fusions of different chromosomes that cause various mutations. At this point, telomeres are so short that the cell can no longer divide; it becomes senescent and goes on to die.

Short telomeres are literally the "kiss of death."

**SS:** Thanks, Noel. This is intriguing and fascinating. It feels as if

we are at the brink of what Ray Kurzweil refers to as "a fantastic voyage." No one wants to age unless we can do so in perfect health and remain vital and energetic. The benefit of aging and why we want to age is that with age comes wisdom, and the planet is in dire need of wisdom. So I see this as a possibility for longer life and more wisdom.

**NTP:** Thank you, Suzanne. It's been my pleasure to have this opportunity to talk about telomeres and TA-65.