Winder Lyons Interview Dr. Bill Andrews regarding the breakthrough launch of Telo-Vital

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WINDER: My name is Winder Lyons, and it is an extremely great pleasure for me to be here today with Dr. Bill Andrews. Bill is a world-renown longevity scientist with a PhD in molecular and population genetics. A bachelor's in biology and psychology, medical researcher for over 35 years, over 50 patents, pharmaceuticals, nutraceuticals, and the two steroids Lance Armstrong was busted for. Featured in *The Immortalist* and *Longevity Hackers* led research into the discovery of telomeres in the human body. Doc, welcome to the call.

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BILL: I have to tell you that, yes, Lance Armstrong did cheat with some drugs that I invented. When I invented them they were not, we had no idea, that it could be sports enhancing drugs, especially illegal sports enhancing drugs, One was human growth hormone to make baby dwarfs grow taller. Then we invented erythropoietin, EPO, to help people that are anemic make more red blood cells. We had no idea that later people would, like Lance Armstrong, use them to illegally enhance his athletic abilities.

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WINDER: Yeah, that's a tough one. When did you start this research into telomeres and what led you to doing that?

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BILL: Well actually it goes back to when I was 10 years old. I've been obsessed with the idea of curing aging since I was 10 years old. My father used those terms. He said, "When you grow up become a doctor and cure aging." The documentary you just mentioned, the, *The Immortalist* ,almost won an Oscar. My father's in that, and he talks about the story of when I was a kid. Teachers would send me home with notes pinned to my shirt and my parents would open up the notes and it would say, "This kid is immensely interested in science and medicine. You should nurture this." So my father came up to me one time when I was out in the front lawn looking through a telescope

finding Saturn and Jupiter, 10 years old. I had a nice bit eight inch reflector telescope. Uh, he says, “Bill, when you grow up, you should become a doctor and find a cure for aging.” He used that term “cure” and so I’ve been hooked on that word “cure” ever since.

And then he says, “I don’t know why nobody’s done this yet.” I’ll never forget that. I thought, well, it must be something easy. Just nobody’s taken it on so I’ve been interested. I went through High school and college and all the time wondering “What’s causing aging, what makes sense?”

02:54

I started anti-aging clubs and we’d have discussions about it. Some of these people that were my good friends have won Nobel prizes since then and stuff like that. I was pretty much in a pretty elite group. We always came back to the thing that everybody who talks about aging doesn’t have right, I always say, all the twos and twos have to add up and all the theories on why we age didn’t make sense and I was thinking, “I don’t want to just become one of these other people that are in the anti-aging business and all they’re interested in is making as much money as they can off of products that don’t work.” Something that I recently said was, “when you get into the anti-aging field, it’s like a license to lie.” It’s like people have been in this field for thousands and thousands of years, Cleopatra had all kinds of people selling her anti-aging potent potions and things like that. It’s like, it’s been people in the anti-aging field have been charlatan’s forever and ever. But I don’t want to be that. I want to cure my own aging.

04:09

That’s what I’ve been obsessed with. I wanted to cure my parents’ aging. Unfortunately, they’ve passed away now. It’s like I want to do… one thing I like to say a lot is that, “Living is the greatest thing that ever happened to us.” Okay, I love living and I hate the thought that living could become any less lovable for anybody just because of this dumb thing called aging.

04:38

And you mentioned that I have a PhD in population genetics. Well, the reason I got that is because that’s a field of evolution. It’s not, mostly when you hear about evolution, it’s what and when things occur. Population genetics is why and how of evolution and so I really wanted to learn why have we never evolved a way not the age, Okay. I spent a lot of time studying into that and I’ve figured it all out.

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And there's YouTube videos you can go to where I explain exactly why we never evolved a way not to age, and why we actually evolved a way to age because it's actually beneficial to the survival of the species to eliminate the longer lived. I never useE the word old, eliminate the longer lived after they have raised their young. After you've raised your young, there's no evolutionary advantage to living any longer. Okay? Because you, by living longer and rebreeding, you decrease the amount of diversity from genetic swapping of genes and cells. You decrease the diversity, and as a result, the species is less likely to survive rapidly changing environment. Every successful species has evolved a way to eliminate the longer lived, just to increase diversity so the species can survive rapidly changing environment. So that's why we age.

06:10

That's, I know I got way of subject here, but you're asking my history. I've been trying to figure all this stuff out. One of the things that I remember we learned when I was in college, we learned about Leonard Hayflick who had discovered that human cells can only divide a limited number of times. And we thought, well, what's the hell's going on there? A lot of people thought he was crazy. Okay, But I thought maybe he's right. And so, you know, I talked to people and I found people that were actually reproducing his data. And sure enough, if you take a single cell from a newborn embryo and put it into petri dish and start to divide it, it can only divide about 60, 70 times and then stops. Uh, and maybe that had something to do with aging. And so, I thought, "Well, okay, what is it that could be inside of a cell that would tell a cell how many times it has divided already and how many more times it can divide?" We'd spend hours in my anti-aging clubs in the college trying to figure out what kind of biological mechanism could exist inside of a cell for that.

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And we came up with ride tickets at an amusement park. Okay? There's something inside of our cells because cells don't have brains. They can't count. They can't think. But suppose there was some mechanism that every time a cell divided it lost a ticket. Okay? And it divided again, it lost another ticket. Then when it got to its last ticket, it can't divide anymore. And that's what is called cell senescence. And as a result, the cell dies. Okay? And that's, probably what correlates with aging.

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We pursued that in our discussions. I kept thinking, well where are these ride tickets. I was absolutely convinced by about 1975, something like that, that there had to be something like ride tickets. And, but everybody I talked to doing anti-aging research, none of them were doing anything that related to that. They said that twos and twos don't add up. So I couldn't find anybody to work with.

8:34

And then one day in early 1990s, I was at an anti-aging conference. My father, who got me into the film was there, too. He was a television producer, and he was making a documentary on aging, um, or anti-aging. But I heard a person talk about the fact that every time a cell divides the telomeres on the tips of the chromosomes get a little shorter. And he said, "I can take blood from any of you. Can measure the length of your telomeres. I can tell you how old you are and, I can tell you how many, years you have left before you die of old age." And, I thought, my God, these are the ride tickets.

9:21

DNA is a long string of beads. Turns out that every time a cell divides, 40 bases get lost. They, they don't get lost. They actually, when a new DNA gets made, it's just made 40 bases shorter. Every time a cell divides a new DNA gets made and it's 40 bases shorter than the previous DNA. These are the ride tickets. And, so I right away went up to this guy before he even got off the stage. I went up and I said, "Has anybody figured out how to relengthen or how to add more ride tickets back?" He said, "No, we've been working for years trying to figure this out and nobody's done it." And so I said, "You know what? Let me come and work with you, okay? I can have this figured out in three months." It was like the shortest job interview ever because he offered me a job on the spot.

10:21

He already knew I had tremendous success already in developing, human growth hormone, erythropoietin, tissue plasminogen activator, betaseron, osteoinductive factor. I had a pretty illustrious career with developing, being one of the key inventors of many many blockbusters in biotech. So, yeah, I got that job right away. In three months and 17 days I discovered this enzyme called human telomerase. I say human because it had been previously discovered in a pond scum organism called Tetra Hymena.

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The people that discovered it had no idea that it had anything to do with aging or health or anything like that. It was just an interesting piece of biology.

WINDER: Was that Dr. Blackburn …

BILL: Yeah, Elizabeth Blackburn and Carol Greider

WINDER: And they won a Nobel Prize for that.

BILL: Well, they won the Nobel Prize for figuring out the importance of telomeres and the fact that, of the enzyme telomerase, which they called the terminal telomere transferase. The Nobel Prize was not awarded for discovering telomerase. It was discovering the importance of such an enzyme in allowing a cell to divide more and more. They didn't connect the dots to aging or cancer. It turns out it's related to cancer, too.

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I was part of the campaign to get them the Nobel Prize because I really wanted the field to have a Nobel Prize. Nobel Prizes in medicine are always awarded to people that initiated the field. Otherwise, thousands of people would get the Nobel Prize because there is no such thing as medical discoveries anymore by one person. It has to go back to who started it all. That's the way the Nobel Prizes award. I strongly believe they deserved that Nobel Prize.

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Went to work with this guy. His name was Calvin Harley. I went to work with him at Geron Corporation. The plan was somehow, if our telomeres are getting shorter and shorter and shorter, in all of our cells in our body, why is it that our children are born with long telomeres? When they come from our cells, they should have short telomeres. The idea was there has to be something inside of our reproductive cells, our primordial germ cells that prevents telomeres from shortening in those cells. So, we started working, figuring it out three months and 17 days later. My team discovered, I was the person who actually discovered it, but I couldn't have done it without the team. We discovered human telomerase.

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Right away we did some experiments to put telomerase into normal skin cells. We showed that it completely blocked the Hayflick limit. As I mentioned before, cells can

only divide a limited number of times. These cells could go on indefinitely. We called them “immortal” even though they could still be killed.

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We invented the name “immortal” in scientific circles, meaning cells that can divide over and over and over again. We put it in enormous skin cells and showed that the cells completely obliterated the Hayflick limit. We also knew that most cancer cell lines produced telomerase to cure their aging. Okay, so we tried also to produce what’s called the antisense of telomerase and put that into cancer cells. We found it killed every cancer cell by causing the cancers to essentially die of accelerated aging. Brilliant. It had no effect on normal cells.

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I was at Geron Corporation for only six months and we had already demonstrated that we could cure aging and cure cancer, both in about the same week. All the investors got together for a big meeting. I gave a presentation at the meeting on what we had done and then the head of the investment group got up and said, “Okay, we have a cure for aging, and we have a cure for cancer. Well, we can’t do both. Which one’s gonna bring us the quickest return on investment?” Well, everybody said cancer. And even though the company’s name is Geron Corporation, and that’s short for gerontology, they decided they wanted to go after the cancer and stop all work on aging.

15:12

I told them the cancer drug really would never work. It works in the lab but the problem is that the antisense for telomerase inhibits telomerase so telomerase doesn’t work. Now the telomeres are getting shorter and shorter in the cancer cells. When they get critically short that causes mutation rates to skyrocket. The cancers mutate to something that will allow them to survive without telomerase. Cancer will come back.

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That particular antisense I invented, it was called GRN163L, later became Imetelstat and then later it became called Rytelo. I was just approved, 35 years later for the market. The reason it took so long was because it did exactly what I said it would. All the cancers – came back. It’s on the market because it still adds life to people. You know, they still have other problems. But, getting back, when they first made that decision, I had already developed several cancer drugs. The worked great in mice but didn’t work really great in

humans. I have some theories on how to really cure cancer I want to pursue someday. But, I decided Geron wanted to follow this thing that I said wouldn't work.

16:54

I resigned from Geron and started my own company, Sierra Sciences, to focus on curing the aging process. That's what we've been doing these last 25 years. We've developed gene therapies, pharmaceuticals, nutraceuticals. Of course, the thing that I'm most excited about is the nutraceuticals and the reason I'm most excited about them is because they're available now. They don't require clinical studies. They're already generally regarded as safe by the FDA. We just tested like 20,000 different plant extracts looking for anything that would induce the production of telomerase. As I mentioned before, our reproductive cells produce telomerase so that our children are born with long telomeres. That means all of our cells have the gene, it's just shut off. We've done what's called high-throughput drug screening, searching for nutraceuticals, pharmaceuticals, et cetera, that will actually get inside or our cells and turn that gene back on. The most potent things we've ever discovered are in Telo-Vital and I'm excited about that. I'm taking it every day.

18:02

I don't want to mislead anybody. I don't want to be false claims. It is not potent enough to reverse aging and, as I said before, anybody in the anti-aging field has a license to lie. That's what everybody else is doing so there're lots of products out there. Most of them I invented and told them it doesn't work. They still put it on the market but they're saying it reverses aging. There's nothing on the planet that really reverses aging. There's maybe a few things that will slow down aging, but most of the products that you hear about actually accelerate aging. The way I know is I invented a lot of, most of, the techniques for measuring telomere length and measuring telomerase activity. When I see somebody else do these tests and they do it wrong, I know it. I know they've done it wrong. I tell them and they ignore me because they're only interested in marketing their products. Okay, they have data that says what they wish to be true and they're sticking with that despite the fact. I'm just, excuse me, the words, but it pisses me off. I hate the field of anti-aging because it's so filled with charlatans. I am only interested in finding a product that works. I'm not in it for the money and stuff like that.

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I'm just excited about Telo-Vital because after all these years of listening to all these companies claiming they can reverse aging, they can lengthen telomeres, induce telomerase and they're all wrong. I'm so grateful that we now have something on the market that really does. I'm really looking forward to everybody getting this product. Not for the money. I don't sell things. I just do the research. I license the ingredients to Touchstone Essentials. They're marketing it. I hope they make a gazillion dollars from marketing this product. No, not because I'm interested in them making a lot of money, but it's a sign that a lot of people are benefiting from this product. I need the word spread. Get people out there to say, this is it. This is the best thing that's ever come up for anti-aging.

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I know I've gone . . . he asked me how I got started. I just keep talking and talking and talking.

20:42

WINDER: No, it's perfect.

BILL: So, people can edit it all.

WINDER: If people are just trying to wrap their brain around what this is and how it works. Now, when we are conceived, are telomerase in our cells? Is that how this works?

BILL: When we're first conceived, when we're a single cell embryo, telomerase is being produced inside the cells from the telomerase gene.

WINDER: And that production declines as we, . . . and that causes aging?

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BILL: No, when you get to about the eighth cell stage, the gene gets shut off. It's not a decline. It actually shuts itself off. Production stops, except in one cell, in the reproductive cells. The one cell that becomes the primordial germline (precursors of sperm and eggs) that becomes the reproductive cells. In all other cells it stops. It is so we can start aging because it's an evolutionary advantage to us to age.

WINDER: And this product is the result of you analyzing 20 plus thousand different compounds and selecting those that you've discovered, will jumpstart that process again so we can produce more telomerase.

22:03

BILL: I developed a robotic high-throughput screening assay that allows us to test 4,000 different ingredients a day. We've tested 20,000 plant extracts, but we've also tested over 500,000 chemicals. Now chemicals, they're good for tools and stuff like that. It's going to be forever if we ever find one that's gonna be safe according to the FDA to be used. But it provided us with a lot of knowledge on how to - we provided us with positive controls, things like that, through using our assays, that allowed us to then, really do a thorough search with the plant extracts.

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WINDER: When people begin to first take what you have created here, what would their experience look like?

BILL: Okay. Right now, and this is one of the things I really like about Touchstone Essentials, is they refuse to put ingredients into a product that gives instant gratification. Products can be good for you - so there's no way to measure the slowing of aging. That's impossible to measure. If you're aging process gets slowed, you don't feel it. There's nothing. You have to go on faith on this.

Now that said, we do know that even though there's not enough telomeres produced to reverse aging and, if we reverse aging, you would know it, but if slowing down aging, you don't know it. But, as it turns out, even with low levels of telomeres, I don't want to say the word "low" though. With the levels of telomerase produced by, induced by Telo-Vital, the shortest, the critically short telomeres will get lengthened a little bit. But you have to be like over 50 to have critically short telomeres. If you are over 50, you are almost certainly going to experience some improvement.

Things I have heard from other studies that I've done, with different ways of doing things, was endurance getting better, vision getting better, hair color coming back if your hair color had something to do with telomeres. It has to be a telomere related thing. So, people might, should start seeing some of these things if they're over like 50 years old. But, if you're younger than 50, you have to go on faith.

It's still important to take it because it's decreasing the rate of your aging. Everything that you are fearing of having in the future years, it's going to be delayed by taking something like Telo-Vital. Well, Telo-Vital is the only thing you can take right now that will do this. That slows the rate of your telomere shortening. It slows the aging process.

Twenty years from now, you're going to realize you look and feel and behave younger than all your friends from high school that weren't taking this product. Of course, hopefully everybody is taking it by then. People are going to start noticing this. It's going to sell itself.

25:20

WINDER: When you publish your studies you put them in all the major medical journals, right?

BILL: Actually I'm very opposed to the publish or perish mentality in medical research because it makes people publish things that aren't legit. That's why you can find support for anything you wish to be true in the scientific literature. It's also, it's a lot of work.

When I hire scientists I tell them we don't publish. We publicize. We make everything public, all the data public, except for super trade secrets. We make almost everything public and we file patents on them and things like that. Not to keep others from doing the research, but to keep others from telling us we can't do the research. We do get the information out there. We just don't go through the ringamaroll.

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WINDER: Gotcha.

BILL: The hoopla of publishing and having to listen to reviewers that don't know anything about what they're talking about, telling us to do more experiments that are pointless, things like that. It takes up a lot of time. We want, I want, my scientists at the lab bench doing science.

WINDER: Nobody's ever really punched holes in your conclusions?

BILL: No, no. I'm a very fortunate person in that because in my talks, I always give very good explanations. I disprove all the theories that are wrong and things like that. Oftentimes I, at the end of the talks, I'll ask people, "Does anybody still believe that rumor you heard before from everybody else?" They all believe me because I do a really good job. I'm really good at what's called critical meta-analysis of peer-reviewed studies – I coined the phrase. I am really good at evaluating studies and looking at the raw data, looking at their experimental design, looking at their interpretations of the data et cetera. I can find out what's real and what's not real.

WINDER: And you think that, with more research, you're going to have a whole nother iteration of products coming out that are going to more and more increase our longevity and decrease aging? Eventually you'll succeed at curing aging which means what exactly? How long would we live and what would that look like?

27.40

BILL: We're venturing into the unknown. But, I can give you predictions. First of all, yes, my goal is to develop something a lot more potent than Telo-Vital. Telo-Vital will help you live long enough to be around when I develop these other things. But the obstacle isn't the science. The obstacle is the funding

WINDER: Well, that's going to get fixed here.

BILL: Yeah, well that's what I'm hoping. Anybody who buys Telo-Vital should be aware that a portion of the money that's made by Touchstone goes to my research and every bit of it is going to be spent on research. It's not going to be spent on anything else. It costs us to do our high-throughput robotic screening assay. It costs us $2 million a month to do that screening.

WINDER: That's it.

28:25

BILL: That's it. If people think that Telo-Vital is just something that was thrown together with a few hundred thousand dollars, that's wrong. I mean, if you take how many years we worked on this Telo-Vital and how much money, that adds up to millions and millions of dollars to develop Telo-Vital, but I want to continue that research because the more research we do, the stronger and more potent things we come up with, umm, I don't know what the limit is to how potent we can get with plant extract, but we've tested about 20.000 and there's essentially 3 million plant extracts that are available for testing so we can still do a lot more. Plus, when we start finding different things that work, we can start combining them to see if there's synergy. That's why Telo-Vital contains five different plant extracts, the five strongest, because they might be synergistic. It's hard to test for synergistic especially when it cost so much money to do the screening.

WINDER: But those five are the most potent you've found so far?

BILL: Ever. Ever.

WINDER: And that's what this product is, just the five things that cause telomerase to be produced.

BILL: Yes, actually there's three other ingredients in there that don't induce telomerase. What they do is protect telomeres from what I call accelerated telomere shortening. Anti-inflammatories, anti-oxidants – they're also vegan and organic which is a really, really good product, the best of all worlds.

WINDER: This has been an absolutely enlightening conversation and I very much appreciate your time, sir.

BILL: Thank you. The power to everybody. Just get yourself in good shape with Telo-Vital

WINDER: And spread the word y'all. Tell people this is probably the most significant moment in our lives. Potentially. This is the thing that could change humanity for the better for everybody so thank you sir. Appreciate it.

BILL: Thank you.