Can Your Hair Follicles Unlock the Future of Regenerative Medicine? | Dr. Drew Taylor | Ep. 174 Transcript

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Intro and Hair-Follicle Stem Cell Overview

One day we're going to be 3D printing human organs on demand. Right now in our lab we've already taken the stem cells from the hair follicle and created fat, bone, cartilage, obviously thin cells.

And on top of that we engineered neurons, pancreas cells, even NK cells part of our immune system that staves off senescence and cancer. Dr. Drew, why are we so sick here in America?

There's a lot of different reasons. I think we are not active in us as a whole. a healthy point of view podcast, your top rated show, where we bring experts from all over the world to talk about health, wellness, beauty, and mindset.

We have Dr. Drew Taylor. He traded the baseball mound for a research lab. Dr. Drew Taylor, PhD, co-founder and CEO of Acorn Biolabs, the company growing stem cells from your own hair follicles and cryogenically banking them for regenerative medicine.

At the root of the hair folicle, what we're seeing is that we can stimulate them to produce more keratins. You can actually have thicker hair or if they've recently entered a state of dormancy, you can revive those.

If I inject it into my knees, is my knee going to grow hair? The MSCs are doing a job in your hair follicle to stimulate other more specific cells that produce that keratin.

And in the knee, it's very similar. You're not going be growing any mustaches underneath. Why so much negative press on some of these things when it comes to stem cells?

I think like in any industry, there are individuals that are trying to… Welcome to another episode of a Healthy Point of View podcast, your top rated show, where we bring experts from all over the world to talk about health, wellness, beauty, and mindset.

I'm your host, Sam Tahata. Today's guest, we're gonna be talking about stem cells. Not how you're typically used to, about bone marrow and fat. These are gonna stem from your hair.

This is revolutionary, guys. We're going to be taking a deep dive in the word of regenerative medicine. Who do we have here today? We have Dr. Drew Taylor.

All right. Amazing, all right. Dr. Drew Taylor, man, welcome. We've been waiting for this one. I'm excited to be here. That was a hell of an intro, so.

Yeah. Have you ever seen an introduction like that before? No, the chicken's my favorite part. You know, I am all about choking the chickens. There you go.

So, let's just get straight to it. Let me ask you a question right now. Before we get to even know who you are, Can we reverse disease with a hair follicle?

Reverse disease. With the hair fallicle. Yeah. The answer is yes. I think the air follicles is an incredible resource. It's being investigated in a number of different ways, but clinically already we're using it to reverse signs of aging and reverse hallmarks of ageing in our skin.

The hair follicle also being from the hair folicle is a prime target for hair regeneration. So it's being used clinically today. The next wave is going even deeper, so orthopedics and fertility and other areas.

Wow. Fertility also, huh? So what is it in the hair follicle that is creating all of this healing and this anti-aging property that you're talking about?

Yeah, so inside the air follicles, this miniature organ really, it's got multiple different germ layers of cells, types of cell and high concentrations of mesenchymal stem cells.

So these are the same stem cell, same lineage that we find in our bone marrow, dispersed through our fat. and they're clustered together in the bulge region and the shaft of the hair follicle itself.

So you can access MSCs for the first way using Beck non-invasively just through plucking follicles. Wow, well, when was the breakthrough where you figured this out?

Because I mean, listen, we all have hair, right? So it's like, this is something very new that people are, tuning into right now that I don't think not that many people have heard of, you know, grabbing your stem cells from a hair follicle.

Yeah, no, absolutely. I think there's a few reasons why it's gained a tremendous amount of attention recently.

How Hair Follicles Become a Regenerative Source

Part of that is just the evolution of the work. So there are some great scientists and clinicians that are working on hair-folical research and evaluating the hair stem cells, hair follicle stem, cells going back, you know, the last couple decades.

But it's been very much trapped inside academia, institutional investigation. This is the first opportunity to kind of branch out of that and start to leverage it clinically.

I think that's where we came in. We wanted to make sure that we're actually driving value for patients and providing doctors with additional tools. And so with the knowledge of these stem cells existing, we innovated ways to capture them and to use them in the laboratory to create products that send back to the physicians to using those regenerative medicines.

Interesting. What makes it different between what you guys have through the hair follicles versus a lot of these other exosomes that we see out on the marketplace now?

Yeah, so to capture exasomes, for instance, right, which is part of what we do, you have to have a cell that you're targeting, to release those exasm capture.

So those can come from a few different places. Most of the efforts have been really to try to capture the youngest possible cells. So we're going from donors that are where we are capturing either placental cells or umbilical cord, all of these different areas of cells when we feel like they're the absolute youngest, typically at birth.

That's fantastic in concept. Unfortunately, we still have differences between that donor that we're harvesting those cells from, the eventual recipient, patient.

And on top of that, when you're capturing cells, from that source, The next step is to actually replicate those sells. And so we have to divide and multiply those cells.

And the nerd word we use in the lab is called passaging. So you take these cells through all these multiple lineages and passages where you're creating the ability to fill thousands of vials and send it out to thousands doctors' offices and stock shelves with a regenerative product.

That expansion, that replication, those passages age cells in a laboratory before they ever reach the product, Okay. And so there's been a couple of great studies about this where they've actually evaluated a lot of those standard protocols that are used to amplify these signals.

Ultimately, we see those cells age very, very quickly in the lab, oftentimes reaching performance ages of over 90 years old before we even capture that regenerative product.

Oh, wow. So, seeing that, you know, and obviously still some benefit being delivered and things, because even older cells do produce volumes of factors, we said, what if we eliminated that process of expansion, went one-to-one with the patient?

So that way we can match their biology, so there's no immunogenic or rejection concerns, but also we don't go through those expansion steps. So because it's one-to-one, we don't have to.

And that way we can create a very pure product from healthy cells that haven't gone through those manipulations and expansions in the lab. It worked exceptionally well.

We were able to capture very high volumes of growth factors, peptides, matrix molecules, and exosomes released by these cells. we could capture those very effectively.

from 12 to into their 80s. And so we have quality cells, maybe as we get older we'll have less of them, but if we give those cells a chance in the laboratory to release these molecules over time without asking them to expand, we can get a really healthy, regenerative complex, the secretome that we deliver back to patients.

Now when you get that secretome, that product, the end product what are we using that for? Yeah so it has a lot of different avenues and essentially is all of the healing and stimulatory molecules that a stem cell is releasing.

So you know that spectrum that I mentioned before. Those are very effective at regenerating connective tissues. And so the first wave of applications that we've been investigating is in skin and hair, so obviously topical considerations because it's on our outside.

So right now, the Secretome is being leveraged and we called it U. The brand is actually called U because that's exactly where it is from. And it has applications in Skin Rejuvenation, Wound Healing, and Hair Regeneration right know.

Wow. You mentioned earlier the younger cells, how it's been told that the better the cells are. So that's why we've seen umbilical cord or placenta cells.

When it comes to the hair follicle, You know, people are banking at age 25, 35, 45, 50. Does it make a difference when it comes to the hair follicle, what age you're banking it at?

So obviously things accumulate as we age. There's different periods of time in our lives where we kind of go through these areas of aging faster. Stanford had a great study on that.

But ultimately, when we're thinking about delivering our own biology back to ourselves, there's only one of us. So whatever the age that we can capture is, that's our only opportunity to capture your own cells.

And we've seen clinical benefit in patients up to 87 using their secretome harvested from their cells currently to create products in wound healing and skin care.

So we've proven it out that essentially with older patients, when we take those cells out and we put them into the laboratory, they may be a little bit slower at accumulating these factors.

But if you give them a period of time to do so, we can amass very high volumes. And in that way, even older cells have an opportunity to catch up to the production of their younger counterparts.

Secretome, Exosomes, and Age of Banking

So you give them more time even though you've got maybe a lower stem cell yield, you still can amass very high

volumes of these factors that would resemble their 30-year younger cells.

So that was an exciting opportunity for us to really create a system. We've patented that system and I think it's part of the value that we bring. But it really allows for this to be a autologous from that patient themselves product that doesn't compromise the strength.

What would be your recommendation, like how young should people actually bank their cells? Yeah, that's a great question. So my beautiful wife and I have three young boys at home, 1916, nine, youngest being nine.

We have collected his follicles as well, and all three, no complaints, so it was an unbelievably easy process. The nine-year-old cells were a little, the yield was a bit smaller because he's obviously pretty young.

Typically we see the full follicle development around the age 12 and up. So that's the target that we recommend, although people have wanted kids banked younger.

What happens if they are younger? It's just typically a little bit of a lower cell yield per follicle because the follicles are smaller. And that takes the longer for it to develop secretomes?

You just have a lower number of cells and a low yield of the cells that are released in secretome. Again, we can catch it up in the production, so it's not an issue.

But we have very strict metrics when samples come into our lab, where we actually analyze cells, their viability, the metabolism, and make sure that we've got a cell yield that can use now and in future.

And so I think when you collect a patient under 12, you might be risking that you potentially top up with another collection to make sure that we have enough of a yield to have that banked in the future.

Absolutely. Earlier you were talking about the different type of applications once you have the end product. So you talked about skin, and then you also talk about hair applications.

What type of applications are you guys seeing in the industry that you would also want to bring this product into those type applications? Yeah, so my background in training was actually on the regenerative orthopedic side.

So I'm a big believer that this is going to be a massive tool in sports medicine. We've seen TRP and some other regenerative applications really be effective, you know, with, to a varying degree in different things, but be affective in sports medicine for the reduction of inflammation and the ability to deliver some good things to help us heal faster.

We are Coming to that same vein with kind of the next generation of technology beyond PRP, we've actually tested out what we can yield from a growth factor perspective against PRT and we have up to 34 times higher levels of various growth factors that are important for connective tissue healing, including sports med and orthopedics.

And we did an animal study recently in collaboration at the University of Calgary where we showed that the treatment of mice with focal defects or knee cartilage, we were able to actually see regeneration of that cartilages by applying the secretome into the joint.

And so that's an exciting opportunity for us to demonstrate the potential and obviously the next step is to start applying this in human patients, which is beginning now.

You know, when we talk about application, some people that are listening to the podcast, they might start thinking, well, this is exosomes that come in from the hair follicle.

So it must produce a very powerful signal for hair restoration. Is that true? It is true. But there's more diversity in that signal that also influences other conditions.

So inside the hair follicle, you have a cluster of cells at the very bottom of the follicles called the dermal papilla. And that is actually the cells that are producing the keratin fiber of hair that's coming out.

The MSCs that we're targeting are actually in the shaft and in a bold region of the follicle, and they release all of these soluble factors, the secretome, that actually stimulate and help deliver really building blocks to the dermal papilla to be able to do this.

And if you look at histology of follicles that have gone dormant, patients either do androgenic alopecia or otherwise, you can clearly still stain the dermal papilla and see it at that histologist.

But it's very difficult where you have much, much lower yields of the MSCs. There seems to be an escape of these MSC's from the hair follicle because they service the skin around them.

as well. And so if you can actually redeliver those signals to the cup, the root of the hair follicle, what we're seeing is that we can stimulate them to produce more keratins.

You can have thicker hair folicles. Or if they've recently entered a state of dormancy, you could revive those. After a certain amount of time, it becomes more and more difficult to revive hair fallicles that have gone dormant.

But we've seen follicles where we are not producing keratin before start to actually produce that fiber and create that follical. So either thickening existing follicles that are thinning or actually creating regrowth in areas that have gone dormant is really what we're seeing.

The secret tone, the factors deliver back to those follacles. So my question to you now is a question that the people that want to be educated, unfortunately they're currently uneducated on this topic, but there's some people out there that a questioning this and I know they are.

Well, this helps grow hair. If I inject it into my knees, is my knee going to grow here? Yeah, so it's great. And I think what we talked about is really that differentiator, right?

The MSCs are doing a job in your hair follicle to stimulate other more specific cells that produce that keratin. In the knee, it is very similar. They're stimulating connective tissues, like cartilage and ligaments.

we're stimulating those cells to perform better in the same way. And so, you know, it's very early. We saw it demonstrated in the animal model very clearly.

You know there's not existing follicles or these dermal pathway that exist. So we're not going to be stimulating any straight hair. Instead, we are going be simulating chondrocytes to produce extracellular matrix, type two collagen, and stimulating some of the fibroblasts and other cell types that are present in other areas to to, to produced extracelular or matrix like type one and type three collagen.

It really is is stimulating the cells that they that these secret homes are meeting and making sure that They have the resources to actually assemble their job Not necessarily replace their jobs or create the hair follicle or crave whatever.

We're more just these these are stimulatory All right fair enough. So we're not gonna grow a mustache on our knees. You're, not going to be growing any mustache underneath cool, man, so You know in the world of stem cells and exosomes, you know When we look at the age management industry, or we call it anti-aging, functional medicine, longevity, whatever we want to call here, it's very common for people to utilize exosome products for age-management.

How do these products work when it comes to preventing disease? So I think there's two ways to look at this. There's diseases that are specific in people that our aging is really like the lack of, we can assign that degradation to a specific disease.

Orthopedic and Sports Medicine Applications

And then there is just the kind of active aging itself. And of course, we can kind of debate about whether aging is a disease in itself. But either way, what we are doing with the entire stem cell focus and derivatives of stem cells, including secretome, excluding exosomes, is trying to deliver our bodies back the raw materials and the molecular cues and signals to help our existing cells perform at a higher level.

And so if, as we age, we don't have either the resources or we do not metabolize the resource as well so that we get access to them and our cells get tired and don t continue to perform as wel.

The effort is really to rejuvenate those cells by supplying them with a higher concentration of younger growth factors and molecules, higher levels like we had in our youth and get that performance back again.

So it is a very noble task, and I think we're going through a phase of increasing complexity on how to deliver that. And I the Secretome is an excellent way to do it from your own biologic source, where you're not worried about compounding the situation with potential inflammation.

Absolutely. Dr. Drew, why are we so sick here in America? Big question. It is. There's a lot of different reasons. I think that we're not active enough as a whole.

We can make better choices in what we eat. There are a number of things we can do physically to be healthier and feed our bodies. and exercise our bodies.

On the other side, I think mentally there's a ton of considerations in how we behave and what we prioritize that can also make us a lot more healthy and at peace with our current selves.

So lots of areas to touch. And I'm definitely not an expert in all of them. No, no, but listen, you're in the industry, so you know quite a bit. Let me read this to you.

Three in four U. S. adults have at least one chronic condition. Why are we better at treating disease versus preventing it? You know, we're talking about the application of prevention.

So we live in this such a sick care model. And I know there's a lot of recent talk of us taking more of a proactive approach, right? But everything's been so focused at treated disease, treating diseases, treated diseases.

why not so much the preventing side? Yeah, it is the major issue right now. And unfortunately, our entire health care system has been established as a reaction to when something goes wrong.

So if we have a disease, how can we treat it? We break our arm. How do we deal with that? And it does make sense historically. Unfortunately, What it means then is we've got in this constant cycle of not addressing problems as they're coming or before they are coming and predicting them and understanding how we can take decisions today to stave off those from potentially developing later or never at all.

And really, I think the key to eliminating these is prevention, not treatment. There's amazing groups out there and your work is credible. We're trying to be a part of that mindset.

And so this is something that even just whether you're taking treatments right away or whether your preparing yourself, banking yourselves for the future is a very proactive preventative approach.

Absolutely, man. So when we hear the word stem cell, there's been some negative stuff that has ended up on the press and the media. People have gone blind from medical providers injecting stem cells directly in somebody's eye.

There's a lot of things that can create a conflict when it comes to stem-cells. I want you to comment on that. Like, why so much negative press on some of these things when it comes to stem cells?

I think like in any industry, there are individuals that are trying to deliver proper care, individuals trying capitalize on an exciting area where they can be successful and monetarily gain.

Stem cells is no different than any other technology. It happens to be in health applications that we tend to believe that people are always acting in our best interests with the Hippocratic oath, you know, in tow and all of these things.

But unfortunately, that's not always the case. I personally have seen in my career, many people come to us even after having stem cell applications, unfortunately in a less credible space or clinic or even through travel tourism and unfortunately have very bad reactions against these cells.

There's only one of us on the planet. Everybody is even identical twins of differences and, unfortunately, when we think about receiving cells, we do one or two things, right?

We match those cells perfectly to you, which is being from you. So, you know, the other option is a donor. In all areas of classical medicine, we think about donating organs or cells to treat patients.

We put that patient on immunosuppressants. And we do that because our bodies will recognize foreign cells as being foreign and attack them.

Hair Regeneration and Clinical Use Cases

It doesn't mean the cells cannot produce some benefit. They might release a payload of growth factor or other things that are less specific to ourselves, like proteins that that, are more simple.

But all cells and exosomes themselves have markers on their surface that we identify as not our own. And our immune system will clear them for us. And so those, depending on how strong that reaction is, and it can be very difficult to protect, it's why there's a lot of parity in this conversation.

Not everybody will react to a stem cell source negatively. more positively, but you don't know, right? You're rolling the dice and seeing what happens.

And so we've had lots of people that have come to us that that had had injections of stem cells, you know in another country for hair and come back losing more of their hair severely.

You know we had patients that come that back that has had knee injections, stem cell and you now have had their knees blown up three times the size and they're looking for, they are now in a worse situation than they were before.

and now more desperate for answers and solutions. And so there's a lot of risk with these things because I think that there are decisions being made sometimes where they're looking for people that are searching for solutions, sometimes in desperation, but there is a great doctors and scientists out there that are using stem cells, I think, in a very disciplined way, and in line with the current knowledge that we have around delivering that care.

And patients are getting great benefits today from these materials. Far more patients getting benefit than not. I think that we have to be very careful.

It's difficult for me even to look at a practice that's operating outside of the US and understand whether they're credible or not just from a website, right?

It it's very difficult. I can't imagine for a person that doesn't have a PhD in stem cell biology to sit down and try to understand, whether this is a good approach or they are doing things the right way.

So it's early in this cycle of stem cells being a part of healthcare, very early. But there's no question it will, in my mind, be a pillar of how we deliver healthcare in the future.

Because patients are sometimes impatient at waiting for these solutions to hit their home soil, they search elsewhere. They start to kind of expand that search into areas where they have less understanding, there are less regulations on what they're receiving.

Absolutely. So, you know, I got this baseball here. People that are watching the podcast are like, well, why does Sam have a baseball there? I know he's Dominican.

Maybe he was born with it. We have this base ball here because you have certain background before you even got involved with all this stem cell stuff.

So I want the viewers and listeners to kind of understand like let's go way back to these days, right, the baseball days. And let us know, like, how the heck did you even get involved in stem cells?

You know? Yeah. So I come from a baseball and medicine family. My mom was a nurse. And my dad was doctor. Dad played professional baseball. I very much followed in his footsteps.

But I was always drawn to medicine. My dad being a doctor and working sports medicine also had a practice. But he provided the opportunity for me to actually witness a surgery.

I was seventh grade. And we ended up having a science fair project where we had to pick something mechanical and break it down. So me being the nerd I, was I picked the total knee arthroplasty, the fake knee.

And I mean, maybe I'm dating myself here a little bit, but there was an auditorium where you could actually kind of observe surgeries. And so I had a chance to actually go in the seventh grade and watch a knee replacement live.

It was a phenomenal experience for me and it definitely really solidified desire to be a doctor. I uh, you know remember every detail walking through the the double doors and and getting that you Know smell of alcohol and iodine right watching, uh You know all of the prep that was going on by your dad was a surgeon He was he was sports medicine doctor and had a general practice, but he worked with a lot of orthopedic surgeons He actually ended up he's a team doctor for the blue jays for like 35 years.

So after he played over 10 years in the major leagues, went back to medical school and became a team physician for the Jays. So I grew up loving medicine and sports.

And anyway, one of his colleagues that was a surgeon, an orthopedic surgeon invited me in to watch this knee transplant replacement. And yeah, I mean, it was this incredible experience of watching this, but the big impact was the next day, going through rounds and actually visiting that patient with the surgeon and watching that woman who was a little bit younger than I expected, like stand up, give the doctor a huge hug, and just express her thanks at feeling better than she ever had, even though it's just the day after surgery.

And I was walking away with a surgeon, of an experience that was seeing how happy she was. And he said, you know, it's true, this is a great surgery. She's going to have great benefit from it.

Unfortunately, she's a little bit younger. So at some point, the metals and plastics that we put in are going break down. They're not part of her body.

and she'll need a replacement again, a revision of that replacement. And she's young enough that she might need a third one day. And so eventually, those things are long but temporary opportunities to give her benefit.

She will be back in a wheelchair at some point with pain as she gets older. And then he said, in your lifetime, instead of using metals and plastics, we're going to use that patient's own cells.

You're gonna have the opportunity to do this if this is what you go down, and we can be able to recreate that joint with the patient own material. That hopefully is a lifelong solution.

And so, I mean, that was one of those moments that you never forget. And it just kind of clicked for me, this passion for regenerative medicine, using our own bodies to heal ourselves and hopefully being able to do that in perpetuity.

Prevention, Safety, and Stem Cell Controversies

Man, okay, so this is way back then. You're in the seventh grade. Seventh grade, right. Or as we say in Canada, grade seven. Grade seven, yeah. So at what point did you get actual exposure to this world of cell therapy?

Yeah, I went off to University of Michigan. I had a chance to play for the Wolverines, play baseball for them. did my undergrad in biology, worked hard, and before I finished, I was able to jump into a master's where I actually studied more specific stem cell work, molecular cellular and developmental biology.

And then I heading off to medical school. I had applied, was going to stay in Michigan for med school, ended up getting an offer to play for the Blue Jays.

Pretty tough to turn down that. I looked at options. They even called the dean and asked if I could do med school and play baseball at the same time. Unfortunately, when the laughter stopped, I was told that that wouldn't be possible.

But I think that he appreciated what I'm trying to do and so suggested, have you thought of doing a PhD while you're playing baseball? And so that's what I did.

I ended up going to University of Toronto instead. So I transferred over to the University Toronto and I do a PhD in biomedical engineering, specializing in stem cell biology and regenerative medicine.

And I have baseball to thank for further pushing me in that regenerative medicine developmental path as opposed to going down the MD path. And baseball didn't last forever.

I played for a period of time in the minor leagues with the Blue Jays and the Phillies and had a great run. Loved every minute of it, but needed some regenerated medicine back then.

Some arm injuries slowed me down. and I was able to go back and pick up that career in regenerate medicine all the way through to today. Have you guys done things with the FDA with this product already?

Yeah, so we're registered as a topical cosmetic product right now, and so that's where it's being paired really with skin applications and hair regeneration.

Typically it is paired with some modality to open up the skin in some way, some micro-needling, laser applications, things like that. And then there's some healing applications as well when you've got, you know, decision lines and things.

So that is an exciting topicle format. The next wave of what we are doing is in injectable format, And so, this we have applied for IRB approved studies.

So, research ethics board approved, studies where they evaluate the study of this as injectable and give you approvals to actually go forward with human testing.

And, so we're in that phase right now. We're going through the process. care regeneration, skin rejuvenation, and we even have on the horizon things that we're developing right now that are taking off soon and hopefully we'll be announcing here in the very near future in orthopedics and facility.

Amazing, man, amazing. If I were to bank my sales today, what are some of the benefits that I can have later in The part of you will stop aging. So that's a nice benefit right now, making sure that you've got some of your younger cells into the future.

Today, you could call upon those cells and capture the secretome from them and leverage them. Pretty handsome, we got a great hairline. I don't know if you're in desperate need, but lots of people are getting benefit from maintaining their skin, maintaining hair line, and then beyond that, There's applications and opportunities.

We post all the opportunities for trials and things. And so there are opportunities to volunteer for some of those things that we post. Obviously, it matters about area and thing.

But there's opportunities jump into those today. In the future, though, I think it's really unbelievable blue sky, right? One day we're going to be 3D printing human organs on demand, right?

There's no doubt in my mind. It'll take us some time to get there. But right now in our lab, we've already taken the stem cells from the hair follicle and created fat, bone, cartilage, obviously skin cells.

And on top of that, we've engineered neurons, pancreas cells, even NK cells. Part of our immune system that staves off senescence and cancer. Really big part of longevity.

And I think that's one of out projects. We have actually a big grant with the National Research Council where we're developing a strategy to be able to create N-K-cells on demand from your banged hair follicles.

So really it's something that we can have as an opportunity to maintain levels of when we're fighting cancer, or my vision is fighting senescence. Yeah, you know, because when you look at the longevity space, there's two things that everyone's always talking about.

You have a lifespan, and then you have health span. So and you've kind of touched up on both right that that health span That quality of life right a lot of the athletes that you know Personally or that?

You've dealt with or you seen that have you? Know the bad knee the back shoulder You know you can really give some people a better quality a life, but then that lifespan now in your opinion Which one's more important, life span or health span?

So I think these things change through our lives, and I can even throw in performance span. So when we're talking about athletes, right, this is gonna make a lot of sense to you, there's a period of our life where we wanna be at peak performance competitively.

So it's not just an idea of staying in shape for a health span or longevity, but it is actually performing at like a world elite level. And that's something where you need to recover for injury fast, you to make sure that your body is completely in tune with itself, and honestly any disruption you feel it.

So I think that there's an opportunity to even think about that performance span as well, something that we're talking with and working with athletes on.

So that's in the kind of like prime years. And then we start to think about health span of wanting to be able to do the things that we love longer. Spend time with our kids, spend time our family.

Do our hobbies, do hiking, skiing, whatever those activities are. We're not competing professionally in these categories, but these matter to our lives and our happiness.

Can we elongate the period of time where we can do them? Longevity and typically lifespan, it does go hand in hand with healthspan. Every time we push health span, we pushed our inevitable longevity or lifespan.

And this has happened throughout history. All of these incremental improvements that we've made have increased both along the way. And so I think there's a big effort to now close the gap between them, but the efforts that we're making in improving health span will inherently increase our lifespan as well.

Yeah, it's like a side effect of healthspan, right? Lifespan is that side-effect, which is, that's one of the things I

always say is like, listen, if you work on your health-spans, your quality of life, and focus on those things, the outcome of that, side effects, is longer life.

That lifespan.

Dr. Taylor's Baseball Background and Path to Regenerative Medicine

Um, you know, when it comes to a lot of these different type of stem cell treatments, do you, I was going in the direction of the, what do they call it, like WADA, WUSADA?

The anti-doping organizations with the athletes. Is this something that is okay for athletes that are under those certain type of circumstances? Or do the consider this as, because I know you were talking about the performance of things.

Yeah, no, I mean as of right now it's okay. It's OK. So we have not, we've not had any interaction with water or response to what we're doing. There are examples of retaining our biology and delivering it back to ourselves that they have touched upon.

And I think specifically it's like the blood doping where you pool your red blood cells and then you put them back in so you've got a higher concentration of red cells.

You'd have a high VO2 max ostensibly. So they've banned that. That's a very specific treatment and technique. But I think a lot of what we're trying to do in this area of performance span is to make sure that you're able to perform.

I absolutely think that these growth factors and things are essential for us in performance. We are capturing them from your own cells. They're not made synthetically.

You're are not created in a lab, captured in the lab from our own cell. It's part of your biology already that we are delivering back. On top of that, our targets have very been focused on actually the recovery due to either injury or areas that we want to heal.

So if we can heal those connective tissues, I think that there's an ability to reduce the systemic inflammation that athletes end up carrying as a burden because of the punishment that they put their bodies through.

And then secondly, when that does lead to actual injury, we can have the opportunity to address that injury and deliver more of the building blocks to our bodies to actually come back from that entry faster.

Long term, as we talked about most athletes, including myself, I tore my labrum and supraspinatus, which is inevitably what ended my career. Just never bounced back and threw his heart after that.

you know, I still can't sleep on the shoulder without feeling that little tweak, right, that pain. And so I know this is going to be something that will plague me, as I get older.

The idea of dealing with the chronic wear and tear that athletes put themselves through as well, It's capture the biology while we're young, help our recovery and performance then, and then help or health span in that chronic recovery potentially from some of these things that are a byproduct of competition.

That's good to know that this is something that athletes could still utilize and not worry about some these anti-doping organizations that out there. Because a lot of the peptides that great for these athletes like BPC157, they can't use it, it's against the rules.

And again, one of the things we know, and we're tracking a number of different peptides, we focused on the growth factors and some of matrix molecules and things because the studies that we ran, skin rejuvenation and hair regeneration, the focus was on that.

As we are switching over into orthopedics and other applications, there's more of a scrutiny around some other molecules that are benefiting us systemically.

So I think this is a really interesting opportunity where patients, athletes can engage in this without that worry of doing something that's been synthetically made and built.

Right. Amazing. So now I know one of the doctors that does hair transplant, Dr. Allen Bauman, he speaks very highly of what you have. I mean from him that means a lot.

Yeah, that's top hair transplants surgeon in the world, right? But he speaks very highly of it and he gets into the science of why this is great for people who get hair transplant or if people want to do the microneedling and utilize these growth factors, these secretomes on the hair rejuvenation protocols.

You have many hair surgeons that are utilizing your product. Yeah, there's actually now, I think, 300 practices across North America that you can go into and have access to the ability to bank and then use those cells clinically.

Many of those are hair practices. We obviously also work with plastic surgeons, dermatologists, longevity doctors, and wellness doctors. So there is a lot of breadth there.

But hair transplant surgeons and physicians that specialize on hair is a big part of who we work with. And so Dr. Bauman is the perfect example, right here locally.

Ultimately, there's a few areas where they're incorporating it today. One is for patients that are at risk of losing their hair follicles. We're banking some of them when they are their healthiest performance, knowing that this may be a struggle throughout their lives because dealing with hair loss is not, there's no one and done solution, even a transplant, right?

This is a lifelong commitment or battle that you gotta decide whether you want to make. or not. So banking the cells is step one, I think, is something that Dr.

Bowen would describe as like the table stakes for patients that want to save their biology. And then there's really kind of two buckets after that. Patients that are ready for a transplant and patients there are addressing other ways to safe their hair before a transplants.

And so, for those that don't want the surgery yet or are waiting, you know, a little bit later for the surgery, this is a great opportunity to maintain the health of your hair follicles, the thickness of you hair, and that the follacles that are at risk of entering a state of vellus hair or follicle dormancy, we can make sure that they continue to produce keratin.

And so that can elongate and extend the period of time until when you need that transplant. We're also seeing that combined with the transplant, so essentially using this topically on top after that to one, help heal the donor area right from the back of the head, and then also apply this on the top of where those follicles were relocated.

to allow them to have the nutrients to bounce back quickly, take hold, and really, I mean, what we're seeing is a massive reduction in both recovery times and obviously the patient's satisfaction goes up when you pair it with it.

Well. Wow. Dr. Drew, man, if we go back to when were in seventh grade. Yeah. Right? And you have another version of you that pops into your office. this young kid who's in seventh grade, what would you be able to tell him, the same way how that doctor told you and said, hey, 30 to 40 years from now, this is what you're gonna be dealing with.

What would tell that younger version of you in 7th grade? Yeah, I'd say 30 to 40 years from now, one kid in seventh grade, we're going to take their cells and cryogenically preserve them.

And then 30-40 years for now you need a new knee.

Future of Biobanking, 3D Printing, and Closing Remarks

We're gonna be 3D printing cartilage on the surface from your own cells, and actually implanting our own biology. That is the future that I see coming.

There's massive collaborations that are going on. A lot of people in longevity and health care are often, you know, the wishes for this magic pill that cures all, solves all.

All of these things work in concert, and our biology is so complex. Our technology is a piece of that puzzle. And there's so many other great doctors and physicians and scientists out there that are working on their own piece.

And I think all of these things are working and coming together synergistically. Like there's a fantastic company up in, I'll reference another one in Canada out of Vancouver, Aspect Biomedical, that's working on building the 3D bioprinters.

So the actual, you know, physical printer that allows us to develop these tissues. And so that is going to be You know one day I think in in every Every medical center right as as a tool as resource to create these structures from our own cells and so obviously We want to be the bank that's hosting your own sells and delivering those when needed and pairing that with those printers and all of these different things so a lot of These things are coming together and I Think 30 to 40 years that a kid in seventh grade is gonna be able to witness it Wow, can't wait to go down to Office Depot, man, and purchase one of those printers.

I mean, I think we're gonna witness it too, right? Because, we are constantly slowing down aging here. Listen, to be honest with you, you know, were saying 30 to 40 years, but the shift in technology, uh, wanna go back to like the year that like when the iPhone came out, what was it, like 2005, 2007, give or take.

Yep. That gap, or even let's go way back, like the years when the internet came about and you had dial-up, just a 10-year gap how much has changed in technology?

And now that we're so advanced where now everyone's utilizing AI and we have all kinds of different learning models out there, I feel like we could probably get to that 3D printer a lot quicker than 30 to 40 years.

So I completely agree with you. I'll give you a great example that I use often when I'm talking about how longevity and things are accelerating. You know, the discovery of flight or the invention of fight, however you want to describe it.

But the Wright brothers built the first airplane. Obviously, it wasn't actually useful, but in the early 1900s, 1903 or six or something, they traveled a distance of like 100 feet.

So they achieved that lift and created the first airplane. Now, it's not going to deliver any value to society, but it is an amazing discovery. It took another close to 40 years before there was an airplane that could take a passenger across the Atlantic Ocean.

and deliver massive value to humans, right? So you could get York to London in an airplane as a passenger. You didn't have to be the pilot in a single-person aircraft.

Right. 40 years, really, to get that. Ten years later, we'd achieve supersonic flight. Another ten years after that, The acceleration of these technologies happens very, very quickly.

And I think we're right now in regenerative medicine. We're in that period of time where we were figuring out how to cross the Atlantic, but it's still early.

In the next decade or two, we are going to be landing on the moon with regenerate medicine I like that. You think they'll be able to land on moon again?

Absolutely. If we put our minds to it, Yeah, I just don't understand why we're so many years past that and no one's done it again. We may need another podcast to dive into that.

So I know, man. I was just talking to my wife about that the other day. Then we both started questions. Did it really happen? Did really happened? Or was it that competition against Russia and other countries?

I think there was such an immense focus and investment into that at a national level that that was accomplished. Since then, that same level of focus, and dollars has not been put into it to repeat it.

But I would think it would be repeatable if we did that again. Come on, Elon Musk. One day. He's doing it as a corporation, right? Not a mission from JFK.

Exactly. Awesome. So listen, I want to go kind of talk about the step-by-step processes of how this works. I know we're ready to… Pluck some hair, right?

So we're gonna catch this. Yeah, hey, I want that man. So then I'll be around 30, 40 years, so when I need that knee transplant, you can just print it out.

All right, the crew's gonna capture this, let's do it, man, take the lead. Absolutely. Actually, Lowe, do you wanna do the lapel mics for this one? Yeah.