

The Human Upgrade: Episode 1104

[00:00:00] **Dave:** You're listening to The Human Upgrade with Dave Asprey. Today we're going to talk about an organ in your body that you probably don't think about as an organ. Over the course of the last 10 years, I've started to look at my skin the same way I look at my liver, where it's a major organ in the body, and it doesn't just sit there and look a certain way and keep you from leaking all over the place. It's fundamental to your biology, and you can't live without it.

[00:00:32] And the health of your skin, with more and more data backing this, drives the health of the rest of your body. So if you have inflamed, unhealthy skin, you have inflamed, unhealthy organs. You fix your skin, you have less systemic inflammation. So we're starting to figure out, is it more that when my insides aren't good, my outsides aren't good, or if I make my outsides good, my insides will be good?

[00:00:55] It's both. And so much of the history of our skin has been, how do I cover it up with paint? And how do I make it look pretty without regard for its health? As a guy who's planning to live to at least 180, and a leader in the longevity field, and having done nonprofit work in the space for more than 20 years, and written big books on it, and very active in making us live longer., I'm paying more and more attention, not just to how I look, but how does my skin work?

[00:01:24] And if you've watched me over the past few years, you can tell. My skin is better than it was before because I've been paying attention to it. That led me to discover something called OS-01. And I think this might be one of the first podcasts out there where you heard about this novel peptide that was discovered using basically AI and a new way of finding compounds that work.

[00:01:48] And we interviewed the CEO of OneSkin, and the reason I did that is this isn't a cosmetic company. This is a skin health company. And its founder, Carolina Reis Oliveira is back on the show today to talk about some new research on specific peptides that change how your skin works, and how it looks.

[00:02:13] Carolina, welcome back to The Human Upgrade.

[00:02:17] **Carolina:** Thanks, Dave. So happy to be here. Have a lot to share in terms of our research and great findings over the past year or so.

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[00:02:27] You were on Episode 944, and I asked you to come on to talk about this brand new peptide. You'd just brought the company out, and since that time, I've seen you on Brian Johnson's counter in a video. I've seen you I think with Peter Diamandis, Tony Robbins. Really a lot of the people working on longevity are saying, oh, hold on, there's something going on here.

[00:02:51] This isn't just another lotion, that there's something going on. So for people who didn't catch the last episode, fill them in on what OS-01 is and how you found it. And let's go into the new research.

[00:03:04] We found the West one when we were testing anti-aging products in the market, and we basically saw that none of the products out there were designed to target the cause of aging itself. So we knew based on our knowledge around longevity science, that was a better way to tackle skin aging.

[00:03:27] And one of the main drivers of skin aging was the accumulation of senescent cells, zombie cells, cells that stop functioning well and build up in our tissues and start secreting inflammatory signals that basically induces the skin to age faster. And then we decided to build this platform that would screen for novel peptides that would be able to target specifically senescent cells in the skin.

[00:03:57] So we spent around five years, and we tested nearly a 1,000 peptides, until we got to OS-01. And OS-01 has this great ability of reducing up to 50% the burden of senescent cells in the skin. And we can also prove that it reverses the biological age of the skin when we are able to decrease the amount of aged cells.

[00:04:24] **Dave:** Okay, so long t-me listeners of the podcast, number one, thank you. You probably remember the interviews I've done, or in my big longevity book, I talk about zombie cells or senescent cells in the body. And you've heard the episodes that I've done about oral compounds you can take, including the supplement's quality. You take them once a month.

[00:04:46] And then that is enough to trigger your body to get rid of these zombie cells. That's not going to do as much in your skin, though. There are some people who are now looking at pharmaceutical compounds that they're trying to put on the skin that are very expensive that may have an effect on that. And I've certainly tried those things like rapamycin.

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[00:05:06] But what you found is a peptide with fewer side effects than rapamycin. And in fact, no side effects that I'm aware of. And it's causing the skin to reverse its biological age. Does this work for all skin, or is this just certain kinds of skin? It's a big claim. It's as big as David Sinclair's. We reverse cell aging. So kind of a big deal. So does this really work? Where does it not work? Just talk a little bit more about that.

[00:05:34] **Carolina:** Yeah, so the interesting part of this peptide is basically that it is absorbed or uptaken by all types of cells, including senescent and non-senescent cells. So imagine that a younger skin, someone around 30s, they will have fewer senescent cells. So the healthy cells will absorb this peptide and will boost their DNA repair capabilities.

[00:06:00] So basically prevent that skin to accumulate senescent cells, which is great because, obviously, it's easier to prevent than get rid of the senescent cells that you have accumulated. For the older skin types, what we have observed is that they have a higher number of senescent cells.

[00:06:19] This peptide basically down regulates the pathways that are associated with aging, with inflammation. So it basically activates, again, the DNA repair pathways. And by reducing inflammation, we can see that our own body can eliminate the senescent cells that are present there.

[00:06:42] So for those that are not very familiar with senescent cells, the most detrimental side is what they secrete, those inflammatory signals. And the peptide has a very strong effect on reducing the secretion of those inflammatory signals, and then brings the skin to the homeostasis state again that it functions well, and it basically behaves like younger skin again.

[00:07:08] **Dave:** Okay. Younger skin. How much younger? I just did gene therapy that is going to take, if it works like it normally does, at least nine years off my DNA methylation measured age, which should put me firmly-- I deal with being around 30. So how many years am I going to lose off of my skin age when I put OneSkin all over the surfaces of my body?

[00:07:33] **Carolina:** Yeah. So the first study that we did, we did in the lab. When we treated with the peptide only, in the media, meaning that the absorption was higher, we saw a reduction of 2.5 years over a course of five days. So this was the first time that we could validate that we could actually reverse the age of the skin in human tissues.

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[00:07:56] But obviously, this is in a lab setting. We did compare with rapamycin. Rapamycin could not reduce significantly the age of the skin. And all of this data is published on a NPJ journal that you guys can find later on our website.

[00:08:13] **Dave:** So you took down the pharmaceuticals. Oh my gosh, heaven forbid. Okay. I love that.

[00:08:19] **Carolina:** Yeah, we described very well the mechanism of action of that peptide for those who are interested. So we were obviously questioning, okay, how long is going to take for humans to reduce their biological age? So initially, we did a small study, just a pilot, with 10 participants. And over 12 months, we could see a reduction of 3.3 years in the age of the skin.

[00:08:47] **Dave:** Okay.

[00:08:48] **Carolina:** Yeah. We believe that we can see maybe the same reduction over a shorter period of time. So we're now repeating the study with a larger cohort. So we have 30 participants in instead of 10. And the main challenge with this study is that we need to collect biopsies. So it's a more invasive study. It's very expensive, but once we had this promising result that we can see a reduction, now we want to see, what is the fastest time period that we can actually measure this age reversal effect in human skins?

[00:09:27] **Dave:** Wow. 3.3 years over the course of a year is impressive. And that's, I'm assuming, the one that goes on your face.

[00:09:34] **Carolina:** Yeah, that's one that we tested with a face product.

[00:09:38] **Dave:** So no, I'm just seeing the comments here from the Upgrade Collective. By the way, if you're listening, and you'd like to join in, you can go to ourupgradecollective.com, and you get to be in the live audience. I'm actually watching people on their webcams. They're watching me, and we're chatting. And one of our members says that she's 65 and has weight loss wrinkles.

[00:10:00] By the way, I also have lost 100 pounds, so keeping my skin tight is an important thing. And she says that she really noticed when she ran out of it after the last episode. Now I'm going to confess something. I noticed a difference when I had the OS-01 because I used it before our first interview.

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[00:10:18] And then I just didn't reorder it because people send me stuff. I have more products than any woman I've ever dated. I have 50 bottles of crap on my bathroom counter. And it's not that I'm using all of them. It's that I wanted to try them, and they just keep coming in the mail. And going, hey, do you guys want this stuff?

[00:10:37] But I used all the OS-01 because I really liked it. But I didn't reorder it just because my processes aren't that good. And I still have half the OneSkin body lotion that you sent me because I hate body lotion. I'm going to go to sleep. My sheets are going to get sticky. That's gross.

[00:10:54] And my clothes will get sticky. So I don't know why people put lotion on their legs, but I have lotion on my legs now because I saw the new research on the body lotion. And people are seeing really good skin tightening. And since I have lost a 100 pounds, I have a little more skin around my knees than I would like because I used to have really swollen arthritic knees too.

[00:11:15] So I'm like, oh, that's probably going to tighten up. So yeah, I've committed to, for the next year, use the body lotion. I'm going to use OS-01 because the data is that strong, and I'll be reporting that. It's also not all I'm doing, just to be really clear. I've done IPL. I'm doing this exceptionally esoteric stuff under my eyes that I think is really profound.

[00:11:35] And so I'm going to be stacking therapies, but just for full disclosure, I am now paying for OS-01, and I'm putting it all over my body because I think it's that important for longevity. And I wouldn't go to the trouble. The expense is one thing. I can afford whatever stuff I want to put on my skin, but I don't like taking time in the morning. And what I found is, it soaks in really quickly, so my sheets aren't sticky, which I like.

[00:12:04] **Carolina:** Yeah, it shouldn't be--

[00:12:06] **Dave:** Is that the I'll be good?

[00:12:07] **Carolina:** Yeah.

[00:12:09] **Dave:** And 3.3 years is worth losing. Do people lose 3.3 years every year they use it? So if I use this for five years, I'm going to look like I'm 21 and I can join a boy band? It's been my dream.

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[00:12:21] **Carolina:** That's a great question. We don't know. It's harder to follow those people for over five years and keep them consistently using the product. The expectation that you could still continue to reduce the pace of aging, maybe not at the same rate, but the fact that we are always slowing the pace of age is already very helpful for slowing down the aging process. But we would need to run a study to validate that.

[00:12:57] **Dave:** Okay. So we don't know. It's actually very scientifically honorable to say we're not sure, but we know this one thing. And what most academics won't do, but most CEOs will do, and since you both have to figure this one out, you say, we don't know, but given what we do know about how it works, I would guess. What would you guess?

[00:13:18] **Carolina:** It will vary for different skin types, depending on the damage. If your skin's in a very healthy state, you are probably not going to reduce 3.3 every year. Maybe the second year we're going to reduce two years, and the third year, year and a half.

[00:13:33] But you are always slowing the aging process, which in the end, you're cumulating those years that you are not aging. So instead, if you're like 70, after three, four years, you can be 60 because you're decreasing three, and two, and one, and so on.

[00:13:52] **Dave:** Okay, so you're going to see diminishing returns in terms of adding additional years. But you'll get your 3.3 years the first year, and the next year you might add another two, and the next year you might add another one, and at that point maybe you're just holding your age on your skin stable so it's not getting old, even though all your friends are getting old, and you can just walk around and make fun of them. Is that the goal?

[00:14:13] **Carolina:** I think the goal--

[00:14:14] **Dave:** You weren't supposed to laugh. I saw you smile. That was a mean question. You were supposed to shame me for that, Carolina.

[00:14:20] **Carolina:** Yeah, I think the goal is obviously be able to reverse as much as possible. I think I can only make assumptions with the data that we have right now. But as science evolves, we can probably make this even a greater reduction than what we have today.

[00:14:47] **Dave:** Okay. I also believe that it's going to work much better if you're not eating things that spike your blood sugar because advanced glycation end products cause skin aging. If

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you avoid eating omega-6 fats, like seed oils, because lipid peroxidation from those cause advanced glycation in products and are also bad directly for mitochondria in the skin, if you do the biohacking stuff that I've been teaching you for a decade, you'll probably get outsized results from any longevity therapy, including OS-01, right?

[00:15:17] **Carolina:** A 100%. Yeah.

[00:15:20] **Dave:** Okay. Now, one thing that you did is you sent me, for this interview, this squishy bag. I'm not sure that it's my style for travel, but I'm willing to be open to it. I have a black carbon fiber one that just feels more manly to me. But what was inside? It's interesting. I'm about to go on a multi-week trip across Dubai. I'm talking with investors there. Going to Turkey, and then Napa. I'm all over the world.

[00:15:55] So you sent me this amazing-- this is the face stuff. This is the travel version. And the main OneSkin, full size one looks like this. So one of them is substantially larger than the other, but neither one says how many pumps are in there. So how many weeks do I get from the travel one, and do I have to travel with this big one? How many pumps do I get in each one?

[00:16:20] **Carolina:** So the smaller one lasts for around the two weeks.

[00:16:26] **Dave:** Okay, so I need to travel with a big one because I'm gone for almost a month.

[00:16:29] **Carolina:** Yeah.

[00:16:29] **Dave:** Okay, so bring the big one. You taught me that. You also have a couple of different formulas that you have shared. You have the eye formula now that goes around the eyes, and then you have the face formula, and then you have the skin formula. Okay. And your cleanser is interesting too. There's a whole set of things that-- my doctor friends and healthcare friends who are into skin, they actually use 40 bottles of stuff.

[00:17:04] I just have the bottles. I don't even know what half the stuff does, to be honest. I try it out for a week, but how would I ever know? So I feel like I'm getting a lot of bottles here, but they each do something very different. Okay, the business part of me is like, if you had a left side of your face for a month and the right side of your face for a month, you could sell twice as much.

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[00:17:23] And this is for just your jugular, and this is for your armpit. So I don't think you're doing that because we've talked enough. You're legit. But, okay, why do I need an eye formula versus a face formula versus a body formula?

[00:17:37] **Carolina:** We were also questioning ourselves if we needed to develop a product specifically for the eye. And when we were studying the skin around your eyes, we saw that the skin was five times thinner than the skin around your face. And we measured the skin biological age, and was around 20 to 30 years older than just the skin around your cheeks or temples.

[00:18:01] So because the skin is much thinner and age faster, it made sense for us to develop a formula that was specifically designed to treat that specific type of skin. So we actually used eyelid skins that we cultured in the lab. So we got skins from [Inaudible] plastic surgeries.

[00:18:23] And then we treated this skin with a formula that we combined a higher concentration of the peptide in different actives until we could see a greater effect that we were seeing with our face product. So, for example, the production of collagen with the eye product is 130% more, while the face product is 40% more just because--

[00:18:51] **Dave:** When you say more--

[00:18:52] **Carolina:** Compared to no treatment.

[00:18:54] **Dave:** Okay, but with no treatment, it doesn't grow at all. It just stays it is or gets thinner. So you're saying that it was 130% thicker?

[00:19:06] **Carolina:** The amount of collagen in the skin was 130% higher than the skin that was not treated with--

[00:19:14] **Dave:** Okay, got it. So you're not talking about relative differences. You're talking about there was zero change in untreated skin, and then there was 130% change in-- okay. That's a really big shift. And that was in a month?

[00:19:28] **Carolina:** This was in the lab. So this is over a--

[00:19:30] **Dave:** Oh, in the lab. Okay. Got it. And you have photos of all this probably on your website and certainly in the brochure that comes with it, which is really interesting.

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[00:19:39] **Carolina:** Yeah. We did clinical studies, and the clinical data with the eye product was also stronger for the area of the eye in terms of elasticity, and hydration, and skin barrier. And all of this is was measured with instruments because it's not just subjective analysis or, I feel my skin is more hydrated or more elastic. We actually used instruments to quantify the improvement. And we saw that the data that came out from the eye clinical study was the strongest one so far.

[00:20:17] **Dave:** Why do I keep pumping the eye thing and nothing's coming out? There it comes.

[00:20:20] **Carolina:** It's going to come.

[00:20:20] **Dave:** All right. I haven't used the travel one yet. I don't know if you guys can see it on the camera. It's just a little drop of stuff. I'm also very lazy. And some people are like judging and saying, Dave, you're a bad person. No, I just don't want to waste time in the morning. It's been two hours exfoliating or something that I don't do. I don't want it to take a lot of time. So here's how much time it takes. I do that. You rub it in.

[00:20:45] **Carolina:** Yeah, on top of stuff.

[00:20:49] **Dave:** All right. So if I do that, I think that's not very much time. Am I rubbing it in the right direction? Do I have to massage my eyes and [Inaudible] or anything?

[00:20:58] **Carolina:** You need apply a little more. You put it--

[00:21:00] **Dave:** I didn't put enough on? Two pumps?

[00:21:03] **Carolina:** Yeah, one pump for each eye, and then make sure that you have a decent amount around your eyelids too. We saw a lot of people that had the eyelid drooping that basically it smoothed out the wrinkles above your eyes, which was really impressive. Yeah.

[00:21:27] **Dave:** I'm using the bigger bottle. What is it? This one? Yeah, this is what the actual eye bottle, the thing that you would use daily. I'm just using the travel one, which-- and it's nice to have travel ones for short trips. Now, the other thing you sent me was a cleanser. And look, I'm a guy, so I usually just get in the shower, and I don't use weird body gels full of things that disrupt my hormones. I just use soap, good old-fashioned soap.

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[00:21:53] And then I wash my armpits, my other areas, and things like that. And the soap forgets that I used it on the other areas before I wash my face with it, so it's not embarrassed, and it's just fine. And then everyone yells at me. Don't use soap on your face. You're a bad person. So I finally committed, about six months ago, to using cleanser in the morning and at night.

[00:22:14] And I've noticed a meaningful difference. Okay, you guys were all right. Thank you for your support. Instead of soap. So I'm advanced. But you had data that showed with your cleanser specifically, your product absorbs 2.1 times better if you use the cleanser before. That's very interesting. Why does the cleanser do that?

[00:22:35] **Carolina:** So the cleanser basically promotes a light exfoliation of your skin. So removes the dead cells, and the impurities, the dirt. And with that, your skin is more open to absorb the product better, absorb the peptide better. So we did the test, the penetration of the peptide with and without the cleansing, and then we saw that there was an increase in 2.1 times when you cleanse your skin with PREP.

[00:23:11] And if you're using in the morning, you don't need to clean again because it's already clean from the night before. So once a day, and it's going to boost the effects of the OS-01 face.

[00:23:27] **Dave:** Okay, so I only have to wash my face in the morning and not at night?

[00:23:30] **Carolina:** Yeah, because at night, your skin's already clean. So you just apply the product. You just slept and then just wash with water.

[00:23:39] **Dave:** I hate washing my face at night. The reason being-- if you guys are like, Dave, you slob-- no, if you're going to go to sleep, splashing water on your face before you go to bed doesn't help with sleep quality. So I don't mind smearing stuff on my face. So that's cool. So once a day, cleansing with the OneSkin cleanser in the morning, then put on all the OneSkin face stuff, the OneSkin eye stuff, because I'm already out of the shower.

[00:24:07] I cleaned my face in the shower. I had to wash it anyway. And then I put the body lotion on. I'm just doing arms and legs. Should I be rubbing on my butt to not get cellulite or on my chest? Women have different skin on their chest. Guys don't. I'm not worried about what I look like in a low-cut dress because that's not my style. But do I need to really do my chest. It sees the sun, but not that much. Can I skip that?

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[00:24:33] **Carolina:** The body product was basically to treat your skin as a whole. So obviously, there are areas that we all want to improve the appearance, we want to improve the thickness, or you want to basically improve some damage. But if you want to make your skin stronger, more resilient overall, ideally, you would apply the body product in your whole body. I know that for men, it's a little more challenging if you a lot of hair.

[00:25:06] **Dave:** I was going to say. I'm not that hairy. I have the Neanderthal gene. This is the only thing I ever got from 23, in me, that was useful. I have the Neanderthal gene for less back hair. So this is a gift. And I'm not a very hairy person anyway, fortunately, probably because I had very high levels of estrogen when I was younger.

[00:25:24] In my early 20s, I had lower testosterone and high estrogen than my mom because I was obese and because all of my testosterone was turning into estrogen. I don't have that problem anymore, but even so, I don't like it in my chest hair. So I guess just deal with it is what you're saying.

[00:25:40] **Carolina:** Yeah, ideally, as we said, we did this other clinical study in which participants use the body lotion twice a day, and we actually measured how the body treatment impacted our systemic levels of inflammation. So we collect the blood off those participants before they start using the product. Three months after, we measured the levels of inflammation. And for those that were using twice a day, we saw a significant decrease in the level of inflammatory cytokines, more specifically IL-8.

[00:26:16] **Dave:** Okay. That's big.

[00:26:19] **Carolina:** Yeah. That's why, if you are willing to go through smearing product on your whole body, there is a good reason behind why you should do it.

[00:26:33] **Dave:** Okay, and I will be really clear. I have a lot of friends. Someone was just asking me on the airplane yesterday, flying back home, how do you know all this stuff? Why did you put this together before other people did in the whole biohacking movement? It's like, because I was learning from people in their 80s when I was in my 20s because I ran a nonprofit group.

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[00:26:56] So I have friends, and I cultivate friends who are much older than me because they know all this stuff, and they've already made the mistakes that I would likely make. And in fact, David Perlmutter comes to mind, who's a dear friend and just a sweetheart of a human being. And when I chat with him, he says, one of the things that I miss, I really wish I would have been more aware of sun damage.

[00:27:19] He's a sailor. He's always sailing his boat around, and he gets a lot of sun, and so he's now really aware of it. So I listen, and there is not an old man out there who doesn't wish at some level that his skin works better. No one wants their face to age, but guys are generally like, I know I look wise now, and it's okay.

[00:27:42] But still, we'd like to have healthier skin. So I'm fine to put this on. But the real reason isn't cosmetic. It isn't vanity. The real reason is reducing systemic inflammation, which I have dealt with my entire life more than most people because of autoimmunity and just the way I grew up. Keeping that down makes your brain work better.

[00:28:03] It makes you live longer. So if you want to have a brain that doesn't have love handles and is tired, then you should take care of your skin. All right, fine. I'll start rubbing it on. I'm going to do my cleavage because that's where the most hair is, but I'll do my stomach and all the other places, and that'll work.

[00:28:20] Okay. I'm down for that. One reason too, that I don't think you can say, but that I can probably say, is that the skin is a very effective route of delivery of systemic peptides. And we know this because if you put sunscreen on your skin, it goes into your blood right away. And you can buy testosterone cream that I used until I had kids. You can just rub it on your armpits, or on your perineum, and it absorbs the same way an injection does. So OS-01, might it have systemic effects?

[00:28:53] **Carolina:** Yeah, that's a great question. We believe that it's not going to penetrate up to the bloodstream, but because it's changing the levels of inflammation in the skin, that inflammation that would come from the skin will basically impact your body indirectly. So it's more like maintaining or recovering the health of the skin so your body performs better.

[00:29:25] Because when we do the penetration studies with the peptide, we see that around 5% can get to the dermal layer. So the bloodstream is going to be a little lower, so the amount would

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be very small that it would get to the bloodstream. So the effect is more by treating your skin, and that outcome would impact the health of your body. Now, unless you deliver from a different, obviously, way, either orally or intravenous, then it's another area for us to develop.

[00:30:04] **Dave:** So you're thinking about an intravenous OS-01?

[00:30:07] **Carolina:** Not yet. Obviously in the future. We are interested in exploring.

[00:30:13] **Dave:** So off the record, you're the CEO of the company, and you're highly trained. Is there a possibility that maybe one time some pure OS-01 fell into an IV that was accidentally attached to your arm, just once? Tell me about that.

[00:30:28] **Carolina:** Not yet.

[00:30:29] **Dave:** Really?

[00:30:31] **Carolina:** Yes.

[00:30:31] **Dave:** Really?

[00:30:32] **Carolina:** No, we definitely need to run a lot of safety studies before we got to humans.

[00:30:40] **Dave:** Someone has to be first. Shouldn't it be you?

[00:30:45] **Carolina:** When it comes to that, I think we're probably going to test in the regular animal studies that the pharmaceutical development recommends.

[00:30:59] **Dave:** Okay, what if you were on a cruise ship 200 miles outside of international waters so that you weren't subject to any regulatory body? Then won't that happen?

[00:31:07] **Carolina:** I'm pretty confident on OS-01 safety. Obviously, it will all depend on the doses. So I think at the lower doses, I could try myself, but yeah, that's nothing--

[00:31:25] **Dave:** We want to know safety and that it doesn't cause blood clots in everyone who takes it within six months after they take it because we test everything that we inject ourselves with as a species, obviously. But yeah, I'm down for being one of your early trial subjects because I think it'd be really interesting. And I'm happy to go on a cruise with you so we can just use GPS, get right past them. Like, ah, there's no rules. We can do whatever we want.

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[00:31:53] How about oral? Does it work? If I took capsules, would it have this effect on the lining of my stomach? I know that you haven't done studies. You're not recommending it for this, and eating it would probably taste bad, so I'm just talking about, you have a new peptide. How do we play with the new peptide? Come on. You're doing cutting-edge science here.

[00:32:10] **Carolina:** Yeah, there are so many possibilities, but there are many studies. I need to understand how it's going to be degraded in your stomach, how it's going to be absorbed, the amount that we actually did those. So, so much choice to explore there. Yeah.

[00:32:27] **Dave:** It's my job to push you to the future as fast as possible, and it's your job to be like, I can't believe he's asking me this on the show. Dave, shut up and ask me something else.

[00:32:35] **Carolina:** It's hard to cure all tissues aging. Right now you're focused on the skin, and then eventually, we get beyond the skin.

[00:32:46] **Dave:** Skin is a gateway to the rest of your body. And if you make the skin healthier, you do make the rest of the body healthier. That doesn't mean that I'm not going to ask you about doing both. All right, one other off-label use question, because I just have to ask this kind of thing, if I took some of the facial formula and it was on my little finger and I stuck it up my nose, would it have a beneficial effect on the mucosal barriers? Maybe?

[00:33:13] **Carolina:** We have not tested it in the mucous.

[00:33:16] **Dave:** So there's no data on OS-01 and on mucosal. So it's either going to absorb better or worse, and all that. Okay.

[00:33:23] **Carolina:** I wouldn't recommend a lotion. I wouldn't recommend a lotion. I don't think it's the best delivery. Probably a spray would work better.

[00:33:32] **Dave:** Okay. Maybe you can have a vertical sprayer that's not FDA-approved for the nose, but it just would obviously go in the nose. I've seen other companies do that. Come on, give us the tools. I want to live forever. I need your help.

[00:33:45] **Carolina:** Okay, we'll think about that.

[00:33:47] **Dave:** All right, think about it. That's all I can ask, is think about it because I do think that the pharmacology that you went through, or just, I don't know what to call it, the research

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you did to go through 700 different peptides computationally and then to test them actually on skin cells in petri dishes in the lab, is really cool. And you've found something that no one else has. I'm like, I want to play with it some more.

[00:34:12] **Carolina:** Yeah, and as I said, the results are better than rapamycin, at least in the skin. So there is a huge potential there. It's just that a lot of studies are required to understand what's --

[00:34:25] **Dave:** I respect that very much. And also, I want to be in the studies because I'm one of those guys. So one thing that you did get from the data is you needed one concentration for the eye. You need another concentration for the face, and another one for the body. Why not just put the higher concentration everywhere?

[00:34:48] **Carolina:** One is cost in terms of the peptide to make the product available and at a reasonable price for our customers. The other one is that we tried to increase the concentration of the face product, and we test in the skins of the face, and it didn't improve the results.

[00:35:15] So it's very interesting that a lot of times, if you have more peptide, but if the skin doesn't need, or at least in that specific formula, the higher concentration wouldn't necessarily perform better. But the main rationale is that you have less damage on your body, and then you have more damage in your face, and you have even more damage around your eyes just because the skin around your eyes is thinner and ages faster. So a higher concentration would justify for that specific area.

[00:35:53] **Dave:** Okay. So you need to have the right dose. And the right dose that's not too high, not too low, works better. Who would have thought? Exercise is the same way. There's a lot of people who are getting too much exercise, a lot of people get too little, and that's why at Upgrade Labs we're using AI to determine the right dose of which type of exercise or other input to do.

[00:36:15] And funny enough, if you have less inflammation in your body, you can handle more exercise before you hit the upper limit. So if your skin was less inflamed, you could exercise more without hitting the wall, or you could do something else stressful without hitting the wall, which is why all this plays together. And I think it is more of an AI problem.

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[00:36:32] There's some other stuff that you've found since our first interview about OS-01 that I wanted to review with you. We've talked about reducing senescent cells by up to 50% in the skin better than rapamycin. And guys, if you have compounded rapamycin skin cream, which I've used, it's damned expensive.

[00:36:49] So OS-01 works better and is lower cost compared. So if you're on an aggressive regimen like I am to live a very long time, this is just more cost effective. But I also am just going to say, if you're listening to this, this is not Neutrogena. This stuff isn't cheap, but you are custom manufacturing a novel peptide you discovered in order to make this.

[00:37:11] So it is an advanced anti-aging therapy. But I also have seen studies, and I struggle with this because you sent me the new OS-01 SHEILD, a broad spectrum, mineral-based sunscreen. Guys, sunscreen not based on minerals is dumb. It increases skin cancer risk and introduces endocrine-disrupting compounds.

[00:37:35] That's like drinking diet soda to, lose weight. It's worse than water. So the stuff that you're making is mineral-based. It's got a clean label, and you studied it. Is there OS-01 peptide in it as well?

[00:37:48] **Carolina:** There is also OS-01 there. But the penetration of OS-01 is lower because of the zinc oxide. It forms a physical barrier, so it doesn't allow the peptide to penetrate as well as with the face product.

[00:38:05] **Dave:** I have seen multiple studies for a long time, and I've been an advocate of sun exposure for the skin forever because you need some UVB to increase collagenous thickness because it turns out that sunlight, UVB, not UVA, is a hormetic stressor of the skin. It's exercise for the skin. So if you're skiing and you're in the sun all day, it's going to be bad for your skin.

[00:38:31] But I think 20 minutes of morning sunshine not just affects your circadian rhythm in your eyes. Your skin has its own circadian rhythm. And you want that UVB exposure. So if I was to use sunscreen on my face, which I still don't do most of the time-- sorry guys, I know you're probably supposed to, then I would use it after my morning sun exposure. Is that within your recommendations for skin?

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[00:38:55] **Carolina:** Yeah, ideally, you would go out one day, UV index is below three, so you get some sunlight. And if you're going to stay, obviously, too much out there, or you're going to stay for the whole day working, apply sunscreen, and you'll be protected not only from the UV light but also blue light and whatever other environmental stressors, pollution, and so on. There are a lot of antioxidants that also help prevent that production of free radicals on top of the effect of the peptide itself.

[00:39:35] **Dave:** So we talked about sunscreen. Some people are recommending sunscreen indoors because it blocks the harmful effect of indoor LED blue lights on your skin. What's your take on that?

[00:39:50] **Carolina:** My take is that in our case, our sunscreen, it does have some antioxidants that will protect from blue light. It's harder for us to measure the effect of blue light in the lab. So I can only say, based on our experience, so we couldn't test exactly how much we are protecting from blue light, but because our sunscreen is safe, we added this antioxidants. It's not going to cause any harm. So apply your sunscreen and be protected from whatever blue light, UV light, pollution, everything.

[00:40:28] **Dave:** Okay. And speaking of pollution, some people in the comment thread here from the Upgrade Collective are saying, shouldn't I wash my face at night to remove pollution that sticks to my skin during the day? So maybe I should use cleanser twice a day.

[00:40:42] **Carolina:** No, I said that you should wash at night, not in the morning.

[00:40:46] **Dave:** Oh, you wash at night. Oh, I had it backwards. Okay. So when you wake up, you don't have to wash your face.

[00:40:50] **Carolina:** No, because it's already--

[00:40:52] **Dave:** I have to shave in the morning, so I already have to wash my face. Okay, fine. Wash my face at night. Take away all my fun, Carolina.

[00:41:01] **Carolina:** I think you don't need to wash your face, for sure. Yeah.

[00:41:06] **Dave:** All right. Okay, wash at night. If sunshine in moderate doses increases collagen thickness, and then you put on your sunscreen and you do your OS-01 before, after, you're going to get, in my understanding, the maximum benefits because you have data now that

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says OS-01 in OneSkin supports DNA damage repair. So if the ultraviolet light triggered some DNA damage, it would be able to fix itself better, right?

[00:41:36] **Carolina:** Yeah, correct. And then that's the beauty of the sunscreen, that because it has OS-01, it can also help repair damage because if you are on the beach or whatever, a lot of times, you are going to still get some sun damage, even though you are wearing sunscreen, unless you reapply every two hours. So the OS-01 is there to make sure that if you get some sun damage, your skin cells will be well equipped to repair that sun damage efficiently.

[00:42:07] **Dave:** Okay. That makes a lot of sense. Now, the other thing that you found in your research is that there's, you call it a key aging gene that activates collagen and hyaluronic acid. So everyone listening, I think, knows what collagen is at this point. You need it for thickness, but hyaluronic acid is found in collagen, and it's found in your joints, in your cartilage.

[00:42:33] And when you get most fillers, if you're getting injectable fillers, they're just hyaluronic acid, which is useful because it breaks down over time. It's a natural compound. And then if you had someone who injected it in a weird space, you can just dissolve it with something called hyaluronidase.

[00:42:52] So it's a safe thing, and something your body needs anyway. But here, what you're doing is you're causing the cells to make more HLA, it's called. And then when they make more HLA, they're more hydrated, and then they look better, and then you get thicker collagen as well. What is the key aging gene that's doing all of this that OneSkin is turning on?

[00:43:14] **Carolina:** There is not one specific gene. When we suppress inflammation, we are activating all of those genes related to collagen and hyaluronic acid because inflammation basically prevents the activation of those genes. So by suppressing inflammation, we allow the cells that would naturally produce collagen and hyaluronic acid to basically go back to that production. But we also suppress the enzymes that degrades collagen and hyaluronic acid. So like metalloproteinases or hyaluronidase, they are also enzymes that will be degrading hyaluronic acid.

[00:44:01] **Dave:** So if you're a biohacker nerd like me, you could do a search engine besides Google and search for MMP-9, which is one of the things you're talking about that's formed in

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skin, is a part of aging if you want to get into the details on it, probably more than most people are interested in right now. Actually, there's something we should share.

[00:44:22] And then I want to talk about how you're measuring skin age because you developed a whole new clock for that. But you've offered listeners a discount, so you guys can use code UPGRADE15 because this is The Human Upgrade, and you go to oneskin.co. Not .com. So oneskin.co. Use code UPGRADE15. Save 15%.

[00:44:43] By the time you're done with your first bottle, you'll see a difference. It's pretty profound actually. And so I think if you're into advanced longevity and maybe you just want your face to look better, this stuff really is potent, and it works, and it works differently. I've used lots of things that do work, and this isn't the only thing that I use, but the data here is way more robust than you'll see from some of the brands that are out there.

[00:45:15] There's a lot of people just white labeling stuff from the same warehouses and things like that. And a lot of people just write good copy by copying the website, and then they're just selling garbage behind it. Your research is crazy. It's way above and beyond what I've seen with any skincare brand. So talk about MolClock and how you actually know the age of skin. How does that work, and how did you discover it?

[00:45:44] **Carolina:** Yeah, so the concept off molecular clocks was first introduced by Horvath and other researchers. And basically, the idea is that we would measure the change in molecular marker. In this case, we are measuring methylation and epigenetic marker. We're measuring how those patterns in methylation are changing with the chronological age.

[00:46:13] So when Horvath built the first clock, he used methylation data from different tissues of our body. And when we were using Horvath to measure the age of the skin, we saw that the accuracy to measure his skin age was not very high. So we decided to build a clock that was built only using skin samples.

[00:46:37] So now we got a higher accuracy in terms of predicting the skin biological age because we were training an algorithm only with skin samples. We also published a paper on the MolClock and how it predicts the age of the skin better than the other clocks available. So basically, when we have a skin in the lab, we can measure the age of that skin.

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[00:47:01] Let's say the skin is 45 years old, then we can test our peptide. We can test a final product, and we isolate, again, the DNA, and we sequence that methylation profile, and we can quantify the age reversal effect. That's how we found that our peptide could reverse the age of the skin in 2.5 years.

[00:47:23] And that's how we are also measuring that in humans. We are reversing the age of the skin by measuring the methylation profile. So it's a very interesting way because it's quantitative. It's not bias, and it's the most accurate tool that we have available today to quantify the age reversal effect.

[00:47:46] **Dave:** You talked about something really important in there. You talked about the Horvath clock. I was fortunate to spend a couple of days with Steve Horvath, who created the clock. And we've done a couple episodes on The Human Upgrade about longevity as measured by the true age score, which is a DNA methylation score.

[00:48:06] And what's neat is once you do that, you can run your data on your DNA methylation through, we'll call it different lenses. And the Horvath clock is the most established, we'll say gold standard, but there are other clocks you can use, which is basically, how do I look at all this data?

[00:48:22] So you found a way to look at the data specific for skin to say, oh, let's compare the DNA methylation of skin aging versus, say, blood aging, or all the other markers in the human body. So that is a contribution to the field of aging in general. So now someone else who says, I have my knockoff whatever thing I came up with, they would have to run it against a gold standard clock and go, oh, look, it doesn't work. So then they probably wouldn't run the test in the first place.

[00:48:55] Or maybe they'll have something that works really well, and I'm open to it, but guys, if you're going to do something in skincare, maybe you should be making your anti-aging claims based on a standard measure. And this is a very, very good one, or come up with one that's better. I'm open to that too. We'll do a podcast.

[00:49:12] **Carolina:** Yeah, I think that the next step would be to have one method that would be noninvasive, that we can collect enough biological samples that we can measure the biological

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age without needing a biopsy, which we're not there yet, but I think that would be ideal. So more people could actually get their skin age measured.

[00:49:34] **Dave:** Yeah, and you actually have-- now we're getting really nerdy, but in your papers, you can use UV, I believe, lighting, but you can light up parts of the face with a very high amplification. You can see wrinkles that the eye can't see. And that's another measure of aging, and you guys are totally killing it there. You put it up, and then 30 days later, you can see a difference when you have that-- what's that called? I'm forgetting its name, the imaging.

[00:50:04] **Carolina:** Visia Skin.

[00:50:06] **Dave:** Yeah, it's the one where you're looking under a microscope and it's illuminated from the side with something or another. But there's, basically, different ways that, say, a plastic surgeon would look at your eyes, the skin under your eyes to figure out how healthy it is. You know what I'm talking about. What does that thing--

[00:50:23] **Carolina:** Yeah, I see. So you're talking about the instrument that can measure either the elasticity or the skin barrier.

[00:50:33] **Dave:** Yeah, there's name for that kind of imaging. It's some company's name that I'm not coming up with. But anyway guys, if you aren't willing to get a--

[00:50:41] **Carolina:** Visia.

[00:50:42] **Dave:** What?

[00:50:42] **Carolina:** Visia Skin.

[00:50:44] **Dave:** Yeah, Visia Skin. That's the one. So there's a Visia Skin measure which is noninvasive but nowhere near as good as the MolClock, but MolClock, you'll have to do a skin biopsy, which hurts. So there you go. Those are the two gold standards. I would like, at a minimum, if you're looking for a longevity-focused skin cream, that they would have a Visia Skin saying, look, we can see a change over time. And again, if you got a good night's sleep and you did some other drainage, it might change things on that.

[00:51:11] **Carolina:** Yeah.

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[00:51:11] **Dave:** The MolClock isn't going to be biased by that, so I think that's a gold standard. So yeah, we got nerdy on that. I think the biggest thing people are going to take away from all this is that there's a lot of science behind OneSkin. And if you go to oneskin.co, use code UPGRADE15, you can save 15%. Try it for a month. You'll see what I'm talking about. And I would actually really love it if you just went to Instagram, do a little story, and tag me saying, oh my god, Dave was right. OneSkin does work. So it's just good to let other people know. And if it doesn't work, post on that too. We're a big community.

[00:51:46] **Carolina:** Definitely, we want to learn, if it didn't work for you, what's your skin type? We can obviously get the feedback and see what we can do to make our product work better for everyone.

[00:52:00] **Dave:** All right, now here's the final question. If I wanted to, I don't know, go on the Twinkie diet and just wash them down with beer every day, which everyone knows that would wreck your skin and you would look so bad, is OneSkin still going to help?

[00:52:17] **Carolina:** It's going to help. It's going to have a harder battle to fight.

[00:52:24] **Dave:** You're still going to look like crap. You'll just look less like crap. That's my experience.

[00:52:29] **Carolina:** It's definitely not a miracle cream, so we need to help our skin look younger, and OneSkin can help, and we also need to do our part.

[00:52:43] **Dave:** Beautiful. Carolina, thank you for doing the hard work. It's so easy to start a supplement brand or a skincare brand with no research and no product and just start selling. And it's becoming harder and harder. It's almost like the Amazon effect, the knockoff stuff there. And you go to Instagram, there's all these people without ethics.

[00:53:05] There's like, oh, I'm just going to legally steal this company's-- and you're not legally stealing anything. What you're doing is copying marketing that might have been truthful. And in OneSkin's case, I think your marketing is truthful. And then you're selling crap with someone else's truthful marketing.

[00:53:22] And it's not ethical. And it's not even stealing. It's just making the world a worse place. So I am a fan of just the rigor, going through 700 things, discovering a new peptide,

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putting it into practice. There are very few companies in the longevity space that do this. And this is why you guys have seen me talk about spermidine.

[00:53:41] The research there took a long time. And there are companies doing spermidine. You hear me talk about Urolithin A. The research took 10 plus years. And there's tons and tons of other things like that. But for every one of those, there's literally a 1,000 people selling some herb that they're buying from China, and whatever the heck it is, without substantial research whatsoever and without testing what's in it.

[00:54:04] So I just think your rigor is way beyond normal, and it shows in what your product does. So that's why I wanted to have you back on the show. And if you come up with some new research and a new molecular clock, or the ability for me to stick it up my nose, or take it as a pill, or inject it, or I don't know where else I'd put it, but I'm open. As long as it's going to make me younger, I'm all in.

[00:54:28] **Carolina:** Yeah, thank you, Dave. It's always good to share with you and our audience our data, and I appreciate the opportunity. And I'll make sure to keep you in mind whenever we start those tests with our peptides beyond the skin. I think we'll have next application that I can't share yet, but you may be interested in that one. So this is the next episode.

[00:54:53] **Dave:** You know what? Eye drops. We've got to talk about eye drops next episode. I don't know what it's going to be, but I can't wait. Thanks, again.

[00:55:01] **Carolina:** Thank you, Dave.

[00:55:03] **Dave:** If you guys liked today's episode, you know what to do. Drink some Danger Coffee because it's almost like peptides could work better if your body has the trace minerals that are required for you to build thicker skin. And get some OneSkin.

[00:55:18] The code for oneskin.co, again, is UPGRADE15. And if you're going to make an investment this month in longevity, not just in looking good, this is worth it. Because if it's reducing systemic inflammation by reducing skin inflammation, you're killing two birds with one stone. And like I said, I'm doing it. I'll see you in the next episode.