

Announcer:

Bulletproof Radio, a state of high performance.

Dave:

You're listening to Bulletproof Radio with Dave Asprey.

Dave:

Today's cool fact of the day is about consciousness, specifically consciousness in monkey brains. And new research out at the University of Wisconsin indicates that the brain's central lateral thalamus, which is really deep in your forebrain, plays a central role in your consciousness way more than we thought it did anyway. Consciousness is basically your ability to experience internal and external sensations. A boring definition, but it's better than any other one where we'll just argue about it all day. And we tied that to the brain's cortex and thalamus based on EEG and functional MRI studies in humans and probably in mice too.

Dave:

But in this new study, they took a more holistic approach to understand how brain networks behave by studying awake, sleeping, and anesthetized monkeys. And they narrowed down this region of the brain involving consciousness to a way more specific area than anything that's ever been done. And they found that stimulating a very small area in the brain, called the central lateral thalamus, resulted in a fully conscious amount of neural activity even if the animal was anesthetized. In other words, this one teeny, tiny part of the brain that we discovered through looking at brain networks, the same kind of brain networks, by the way, that we train at 40 Years of Zen, but that was the seat of consciousness, at least for waking up from anesthesia. And certainly, you need the whole network of the body and the mind to be fully conscious and aware and plugged into the world around you. But we're learning more about the brain every day.

Dave:

So when some douchebag comes up to you and says, "That can't happen, therefore, it didn't happen," and you've had a really interesting experience." Maybe it's just because they didn't know about the central lateral thalamus or some other thing that no one knows about yet. We're looking for a new brain stuff and refining it every day. So don't fall for the trap of thinking that we know everything about our biology or our brains because there's cool new stuff coming down at a faster rate than ever before in all of human history and we're here to hack it.

Dave:

Now, speaking of hacking it, today's guest knows a thing or two about hacking the human body. She's a board certified anesthesiologist and fellow trained interventional pain medicine physician. And she graduated in the first ever class of physicians trained and certified in peptide medicine. And if you don't know what peptides are, you need to go out and buy your copy of Super Human. Peptides are these small protein fragments that are changing the face of antiaging. See what I did there? That was awesome, changing the face of antiaging. Come on, somebody laugh.

Dave:

Anyway, I had to say it. Anyhow, I'm talking about Dr. Heather Smith-Fernandez, who's the founder of the Regenerative Institute of Medicine in Naples, Florida. And she created something called peptology, which is a study and clinical application of peptides in living beings, both human and nonhuman. And I consider her to be one of the go-to experts on peptides because she's using them throughout her practice, regenerative treatments, advanced aesthetics, sexual health, hormone therapy, preventive medicine, all that kind of stuff that is motherhood and apple pie to me. So Heather, welcome to the show.

Heather:

Thank you so much. Hi Dave.

Dave:

Now, whenever I talk with a regenerative medicine doctor, I just want to be like, "how old are you?" You look super young.

Heather:

I just turned 50 this year.

Dave:

Are you serious?

Heather:

Yes, sir.

Dave:

Okay, wow. It's one of those things where like, okay, if... Like I'm a weight loss doctor, anyway, 400 pounds, maybe your advice of eat less and exercise more just doesn't work or you don't follow it because you can't follow it, one of the two. So okay, whatever you're doing is working.

Heather:

Thank you.

Dave:

I'll tell you that. I was going to ask you like, "All right. Did you start like Doogie Howser when you were like 12 in medical school?" but you solved it for me. Okay, that was my first thing, like how is this possible? You also do bioidentical hormone replacement, which is something that changed my life when I was 26. It was about 20 years ago for me, because I had less testosterone and more estrogen than my mom when I was 26.

Heather:

Oh yeah.

Dave:

My hormones were seriously broken. So I believe that that really helped to change the trajectory of my health and my life and my brain and everything else. And so that's something that already is cutting edge. But now, you're all into peptides which are super like bleeding edge. What made you go from doing things like hormones into this highly specialized, but really, just a couple year old area of science?

Heather:

Well, I think that like you and like a lot of people who are really committed to thinking about health a different way than what we've been doing in this country for a while, really doing preventative medicine, and what you're doing is overly revolutionary. I was kept awake at night by the patients that didn't get better from my regenerative procedures. We have two patients next to each other with the same problem, whether it was a knee or a back or a shoulder, and relatively same age, same activity level. And a couple times they would have markedly different outcomes. And that's what sent me down the pathway of learning about hormones. Because when I started really digging into the research, the patients that did better with every kind of regenerative procedure were patients that were hormone optimized. And once I got that, so I said, "I need to learn about this," and I did that.

Heather:

In about 2012, I was fully certified in hormone medicine and applying that to my regenerative practice. But I was also searching for when we target a tissue, how can we make the PRP or the cellular preparation, whatever we're putting into that tissue, how can we maximize the healing effect? And the first peptide I worked with was IGF-1 and as some of your listeners and you may know, IGF-1 is an active metabolite of growth hormone and it's highly prolific. It can also wake up progenitor cells to get them to start helping in the healing process. And of course, sermorelin was one of the early peptides that when patients had their growth hormone levels more optimized, they just did better. And then they felt better. And they had all of these incidental improvements aside from what procedure I had done to their joint or their spine. And it was just a love story that started right from there with me and peptides and I went and learned from every person I could possibly learn from.

Dave:

So the idea of IGF-1 or insulin-like growth factor, it makes cells grow faster as well as kind of described, so does insulin, by the way, because insulin makes cells grow faster. That's why bodybuilders used to go slam a bunch of sugar after lifting weights to raise their insulin so they could put on more mass and get swole just by that onset. And then sermorelin is a way of raising growth hormone without injecting the stuff that's \$1,000 a vial to inject. So you're basically modifying the growth rate of tissue so people would recover faster and doing it with these tiny little protein fragments. How do we know that they work? How do we discover all these different peptides?

Heather:

Well, the first peptide that was sequenced outside the body was insulin, and it was a long time ago. And making a peptide is actually a very, very complicated process. Being able to take a large protein from the body and find the active segment that sits in one particular receptor. Some proteins can have multiple actions at different sites. That's often how we think about hormones is that you have one substance that has multiple different actions at different sites of the body, but being able to know which sequence needed to sit in that receptor to get the desired biological effect on the other side was years and years of research in science. And once they learned how to sequence peptides outside the body and make

them stable, which was a really big leap forward in peptide medicine, then you see the research just skyrocket.

Heather:

Some of our Russian friends and our Croatian friends were way ahead of us with peptide research and-

Dave:

Oh, yeah.

Heather:

We didn't get to play with their toys until fairly recently when there was just a lot more information that was being shared. And so we're catching up really quickly though, with being able to utilize peptides and study them.

Dave:

In Super Human, I read a chapter on peptides including a lot of the weird Russian ones that they discovered in young animals, but not old animals and how to use those. And so listeners who are also readers will maybe be familiar with that. But what is the weirdest, most unknown peptide that you're excited about even if you're not sure about?

Heather:

For me, I think that my love is with epitalon... I love that peptide. I think it's the most understated peptide in our toolbox and I use it a lot. It has tremendous capability and it works in so many different areas. It's one of the true antiaging peptides, in my opinion, and it promotes better sleep, healthier sleep, much healthier sleep, and when it's used in combination with certain other peptides, you get a synergistic effect. Literally, people can feel their brain getting younger when they're using epitalon regularly. So that's probably, I'd overhear anybody talking about it and I just love that peptide.

Dave:

I love it that you brought that one up. I've been on it on and off for about the last six years. It's originally, the reason I went on it, is that it lengthens telomeres and it's way more cost effective than some of the other supplements that are out there and probably more effective as well. I mean you can buy it for anywhere from 50 to a few hundred bucks depending on what quality and what source and all that. But what is it doing for the brain? Telomeres are one thing but talk to me about pineal glands and things like that, what's it doing.

Heather:

Yes, it's actually sensitizing the hypothalamus to the effects of our hormones so we're getting more bang for our buck. What hormones you have are going to work better in the brain. And when you optimize your hormones, you're creating the same model that you had when you were younger, where you had more sensitization to those hormones, better receptor activation, better interplay, better cell signaling. And in the pineal gland, in particular, you're really getting back to that state of healthy sleep, in addition to lengthening the telomeres, and that's what we already know. There's probably so much that we don't know about epitalon. And I know you mentioned it in your book, and I was so excited when I read that, so that's probably my secret favorite peptide that doesn't get enough attention.

Dave:

Got it. I kind of want to go into this list of peptides. But one thing that you offered to... I'd even talk about how we met. I went to the American Academy of Antiaging Medicine. I've keynoted there, which is an odd honor. Given that I'm not a doctor, to get to talk to a room of 3,000 doctors is kind of cool. And I met my wife there more than 10 years ago. So like, this is a place I really like. But I only had a little bit of time there. So I went to your talk. And that was kind of the only talk I went to because I'm like, "Yay, let's go deep on peptides." And even amongst that very well-educated crowd of doctors who are looking at aging, they asked you to come up and talk about peptides because you've done a fellowship and you've used them for a long time. And so I enjoyed the conversation right afterwards, which is when I said, "Hey, come on the show."

Dave:

Now, you've also put together a list of sort of the top 10 things you can treat with peptides. For people listening to the show and I already forgot your URL. What's your URL?

Heather:

It's [drheather.net/dave](http://drheather.net/dave).

Dave:

All right, [drheather.net/dave](http://drheather.net/dave). You go there, she put together a bunch of stuff. We don't have any financial arrangements other than I just want you guys to know about peptides. There's a bunch I've written about peptides on the Dave Asprey blog. But Dr. Heather here knows a lot about them and I want you guys to know. And part of this is the price I quoted, it's what I spent on epitalon. It's probably 50 bucks. You go to a proper compounding pharmacy, medically certified, people are going to spend, what, 200 bucks on epitalon?

Heather:

Probably. Yeah, I mean, peptide sourcing is extremely important. I learned that in my practice the hard way. And so I always share with physicians, you need to really know where the peptide is coming from. I can tell you a story about what happened to one of my patients. I normally get my peptides from a very reputable manufacturer and they were out of a peptide. It's a melanotan peptide, which is a tanning peptide, but it's also-

Dave:

I like that one.

Heather:

Oh, it's really good. It's so helpful for autoimmune diseases, chronic inflammation, sleep, libido, and it protect... I live in South Florida where you can fry an egg on my forehead if I'm not careful in the summertime in five minutes. And so it protects you from burning and protects you from sun damage. But anyway, melanotan does have a potential side effect for some people. About 15% of people will get nauseated. The nausea is usually not severe. It usually is self-limited by about 15 minutes, maybe 20 minutes and then it goes away. And not everybody gets this. Well, my normal supplier was backordered and my patient was really not patient about it. They really needed the peptide.

Dave:

Let me guess, it was a guy?

Heather:

Well, yeah.

Dave:

We'll talk about why he was desperate later.

Heather:

He just wasn't hearing that week, "I couldn't get it." And so I sourced from a local compounder that I knew the pharmacist, they were very reputable. I'd done a lot of business with them. The peptide arrived with their label on it. It looked just like it normally should look, gave it to the patient to use, and the patient experienced such severe, severe nausea, like severe nausea to the point where they almost went to the emergency room for three days.

Dave:

Oh, my goodness, that's severe. I've never heard of that.

Heather:

Three days. He was calling me three, four times a day, every day, "What is going on?" I was trying to treat his nausea but as soon as the anti-nausea medicine wore off, he was back to being on his bathroom floor. It was awful. And so I immediately contacted my compounding pharmacy and sent the bottle back and I said, "Please test this. There's something wrong with this peptide. Where did you get it?" And they said, "Well, we got it from so and so." And I said, "Well, is that who made it?" "No, we don't know who makes it."

Heather:

And that is the common story. There's so many middlemen in the passing of peptides that the truth is there's only a couple actual manufacturers. And you don't always know where it's coming from unless you really do the research and know. And so they didn't find any overt contaminants but there was clearly something very wrong with that peptide. And I've heard horror stories of people ordering peptides just off of the internet and for research only peptides and I've seen the pictures of some of the labs out of the country that are making peptides that literally look like they should be condemned.

Dave:

Something out Breaking Bad back in Winnebago. Guys in their BVDs.

Heather:

Yep, 100% like that that you thought, "Oh my gosh, you would inject this into your body?" So, and that was a really important lesson and that happened several years ago. And a lot of physicians just don't know that where... Their compounders can't do full stability and quality testing on every single bottle of peptides that come to them. There's a certain chain that they would have to charge you six times what they charge you. If the peptide is highly underpriced then you probably want to make sure you understand why that is.

Dave:

Got it and then there's markups everywhere along. There's what does it cost to manufacturer, what's the profit that they make. They sell it to a distributor who doubles the price. Sells it to a compounding pharmacist who doubles the price. Sells it to a doctor who doubles the price as well, if I got to say.

Heather:

Yes. That does happen and I always encourage the physicians that train with me to not do that. You really want to be transparent and consistent with... and get these peptides to more people. We don't want them to only be for people who can afford very, very expensive medicines. That's not what we want.

Dave:

No, and they're actually much more cost effective to make than a lot of pharmaceutical compounds and more broad acting and also bioidentical to what our body does.

Heather:

Yes.

Dave:

So let's talk about melanotan for a minute. First, we talked about epitalon, which it makes your brain work well and is a broad spectrum antiaging. We never talked about epitalon. I spend about 50 bucks, maybe 70 bucks on it or something. But the protocol that I learned for antiaging that goes back to 2003, the first research I think, you inject once a day for 10 days every six months, but I've also used it more frequently than that. How often do you recommend using an epitalon?

Heather:

Every day.

Dave:

Really, without stop?

Heather:

Without stop. Just not that-

Dave:

What kind of a dose?

Heather:

Just small doses. So just 10 units, really small doses can be used every day. I like to cycle almost every peptide. I don't just for cost and real estate. I'm not a very big person and my real estate gets sore so I like to just let the injection sites heal.

Dave:

By real estate we mean ass.

Heather:

Well, yeah, and belly.

Dave:

All right, I mean but-

Heather:

Anyplace where there's skin.

Dave:

Right, so the places you inject are the back of the arm, your butt, and I hate doing the belly because it always hurts. I don't do it on my belly, but you can. But those are really the only spots, right?

Heather:

Pretty much. I mean, you can do them anywhere you have skin with a little fat underneath it. But those are the places that are easiest to reach if you're injecting yourself. So, I think that cycling is necessary for a lot of peptides, but even peptides where we don't necessarily need to cycle. I think it's always good to let your body have a break. There's some that you can do just every day and they've been used in high doses for long periods of time and studied and very safe. Epitalon, just 10 units a day in the evening and you can use that long term.

Dave:

Now, what's a unit in terms of milligrams because usually, they sell these in milligrams?

Heather:

That's true. I would have to look at... I always get it from the same place so I haven't looked at the milligram content, but I will get that to you.

Dave:

I'm interested, okay.

Heather:

Yeah, yeah. It's on just-

Dave:

I think that all of the listeners would too. That's okay.

Heather:

I will get it for you.

Dave:

We'll put that in the show notes.

**\*EPITALON RECOMMENDED DOSAGE.** *Note this information is suggested only; please work with your own healthcare provider on dosage that may be right for your personal health.*

Epitalon 10mg/ml, therefore 10 units = 1mg.

Heather:

Okay, perfect.

Dave:

By the way, if you go to [daveasprey.com](http://daveasprey.com), every one of my 700 shows has a transcript, or maybe 700-ish, on the site. They're all searchable and so you don't have to worry about taking notes. I got your back there and we'll put that translation and exactly how to spell epitalon in there as well.

Dave:

Now, if that one's really powerful, why evening is the question I want to get into with you. Okay, the body does all sorts of circadian stuff that we're barely understanding. I know some things like melatonin, if you take that stuff at night, you're not going to like your quality of sleep but why is epitalon a night-time one?

Heather:

In the small daily dose, it really helps with sleep. I'm one of those people who's always had a hard time sleeping, even when I was a kid. I would lay awake and my brain would run so sleep is something I've been chasing for much of my life. Even before real stress was ever a part of my life just is not a good sleeper. So natural things that do help me get a better night's sleep are things I like other people to know about. I'm such a challenge with sleep that if it works for me, chances are it's going to work for 95% of other people.

Heather:

I know that you also use an Oura ring and I read that in your book. I have an Oura ring. I love my Oura ring. It really helps you know what's going on with your sleep and it's such an important factor that when I use peptides either on myself or on my patients tracking sleep, especially if there's things that are used at night, whether it's harming the sleep or helping the sleep, I find that to be extremely important information.

Dave:

Having for 14 years tracked my sleep with headbands and weird stuff, the ring is way better. And yeah, I will wake up and go, "You know what, I don't feel that great." And you're like, "Oh look, I only got 20 minutes of REM sleep or 20 minutes of deep sleep" when on a good night, I should be making a couple hours of each in six hours. I look at what did I do and there are some things, even vitamin D will ruin your sleep if you take it at night. It's a circadian hormone. It just is. And so having that visibility lets you really quickly zoom in.

Dave:

So you figured out epitalon's good for sleep. Now, melatonin's sort of the opposite end of this. You mentioned this one that's good for tanning. It has some other interesting effects you want to talk about

other than avoiding sunburns and getting a nice dark skin. What is the role of MSH, melanocyte-stimulating hormone, which is also known as melanotan?

Heather:

Well, it works in the melanocortin system of the brain and there's four different main melanocortin hormones and they are extremely important in the inflammatory response. So when you're managing, especially with an autoimmune situation where the inflammation is to your own tissues and it's unregulated and it, obviously, becomes a real problem, when you can quiet that part of the system, it's very effective at that and it does promote more deep sleep. It also has a-

Dave:

When taken in the morning though, right? Or do you find it used any time?

Heather:

I think that there are two groups of people. There are those that will take it in the morning and they do better and there are those that take it at night and they have the experiment.

Dave:

Really?

Heather:

Yeah. Especially for those people that get a little bit nauseated from melanotan. It's not a good... Yeah, when they try to take it in the morning. Now that nausea really isn't severe. It shouldn't be severe and it's self-limiting. It doesn't last very long. It can be prophylaxed with several things if it does cause nausea. CBD or full spectrum cannabis is extremely effective at blunting the nausea from ever happening.

Dave:

You can also do, like we make a... This is TrueDark, my glasses company. We make a light you can put over your gut that has red and amber and infrared in it. And if you put that on pulsing that can really have a strange calming effect like it's pretty neat.

Heather:

Oh, that's much better. That would be wonderful.

Dave:

Yeah, so light therapy helps with nausea quite a lot but has to be kind of tight on the belly. What else do you use?

Heather:

For nausea? Well, there's Alka-Seltzer Gold, specifically the gold formulation can be very helpful. And if we go into the pharmaceuticals, the ondansetron is extremely effective. I like to avoid the pharmaceuticals if we can, but people don't want to walk around nauseated. If that's a problem that they have and they're only using the melanotan, they'll use it every day until they get to kind of their desired coloration which is how most people do it and then they'll maintain with two or three times a

week. And even with the improvement in the inflammation, you don't have to use it every day to get that. You can be in a maintenance program where you're only using it a few times a week.

Dave:

Now, I've walked around with a fantastic tan because I use this stuff but really, you feel great when you do that, specifically inside the brain, you talked about those four receptors. There is some evidence that I wrote about in Head Strong about your melanin levels inside the eyes and inside the brain where they don't actually see light being really important for electrical creation and flow. And so I'm looking at this as a cognitive enhancer amongst other things. And of course, it takes time to develop that and you need some light exposure. But I did find I was getting a nice tan but all of my little freckly bits got darker.

Heather:

Yes.

Dave:

Right, which can be an issue for some people if you have fair skin. What do you recommend doing about that, if anything?

Heather:

I like to just tell people that it can happen. In Florida, seeing the dermatologist before you start tanning peptide I think is a really good idea because if you see them after and they see something that got darker and they don't understand peptides then you're going to end up with lots of biopsies, which that's not a day in the park, especially if they're doing 20 different areas. But what I have found is with regular use, you actually develop less sunspots, so even though some of the little darker areas will get darker when you use the tanning peptide. By personal experience, I've been using it for about four years, I just don't have any new brown spots, new sunspots. And I have other patients who've been consistent with that too. They found the same thing.

Dave:

What works pretty well too for people who are really worried about it, like who cares if you have a freckle on your back or something. But if it's on your face or your forehead, you don't like it, in winter, don't use melanotan and don't have a tan so your skin is pale and then there are lasers, like you do regenerative stuff. There's lasers that will remove all the dark spots from your face and then wait a month or two and start taking melanotan and magically, it won't be a problem.

Heather:

It won't be there anymore. Yeah, and there's always that option. You can spot weld with hydroquinone. I don't usually recommend that for the face because it's going to start looking a little calico-like. It's not all going to be that even.

Dave:

Spot welding on the face is the coolest thing anyone's ever said on the show. All right, would you believe I used to weld Toyota truck frames in a manufacturing facility?

Heather:

Did you?

Dave:

I did.

Heather:

Was that fun?

Dave:

So I know about spot welding. And I can tell you, if you're driving a Toyota truck frame that I welded on, I apologize. It was not my calling. So anyway, when you said spot welding, you just brought up all sorts of memories for me.

Dave:

Now, so that's kind of the good things. But earlier I said, how did I know it was a guy who had to have his melanotan hormone. And the reason for that is that if you take that stuff and you're a guy, you are going to be like a teenager. Like it is a pretty substantial like I woke up with a kickstand and everyone around me is really attractive.

Heather:

Yes, there is the aphrodisiac component which we hadn't talked about yet.

Dave:

Yeah. It does that for men, right? Does it do that for women too? I don't-

Heather:

Oh, very much so, yes.

Dave:

Okay.

Heather:

It's actually been used if women are prepared to tolerate the tanning for female hyposexual disorder where the hormones are there, the testosterone is optimized, but they just don't have any interest and actually PT-141, also called bremelanotide was created by isolating that libido enhancing and aphrodisiac component of melanotan. If you use enough PT-141 you will see some darkening of the skin, especially like the cracks in the hands or the areola and certain areas that are more noticeable but you have to use quite a bit of it to get that. It's really not for tanning.

Dave:

Of 141 or melanocyte?

Heather:

Yes, PT-141.

Dave:

I didn't know it still darkened you.

Heather:

It can if you use a lot of it, which isn't really recommended. It's more recommended two to three times a week and not an everyday thing.

Dave:

In your talk at A4M, you talked about it being good for prostate health in men as well. So for the aging sexual function, not just sexual but your urogenital function support.

Heather:

It is because it works on the nervous system instead of the vascular system. We have a lot of different things we do for the vascular system. We have medications, we have shockwave, we have supplements like Neo40, all these different things. When it comes to the nervous system, we have either PRP in cells or in addition to that, we have PT-141, which the studies are pretty impressive.

Heather:

One study that I read had 80% of men had improvement in their erections and these were all men who had not responded to Viagra or Cialis.

Dave:

So I'm just going to have to say this. I don't have any problems with my erections, but I do use PT-141 when I'm getting too dark from melanotan. Either one of those things, like I don't have any problems with them but there's a certain sort of thing. Without being too crass, you look at... I just interviewed Mantak Chia who's like the top Qi Gong master on the planet, and he'll get very crass with you and talk about, "If you can't hang a weight from it, you're not strong. And I'm 76 years old" and things like that. And I'll just say, as a guy who's perfectly happy with the way I function, when you're taking PT-141 or melanotan, there's just another level. You're like, I think this was like when I was 18 or something. I don't know.

Heather:

Yes.

Dave:

Maybe it's better than that.

Heather:

And why wouldn't we want that? There's no reason to not make it as optimal as we can. It's better all the way around.

Dave:

And it's not about just, "Hey, I'm going to have a really good time in the bedroom" although, hey, I'm a fan of that, like anyone else. It's that the energy of sex, if you were to ask any tantric master or Taoist is

actually, the energy of creation. And if you can keep that kind of vibe high, it's one of the most important antiaging things I think you can do. In the book, in Super Human, I read fertile animals live longer. And so if your body's like, you might want to go make a baby right now, whether you're a man or a woman, whether you choose to do that or not, as long as it thinks you might want to, it's not going to let you die and get old because it knows you might have to take care of the said baby. So it's a good way of tricking yourself. And, again, these are cheap, 50 to 150 bucks probably compared to the cost of a prescription for any of the pharmaceutical enhancers that only work on men.

Heather:

Right, the pharmaceutical enhancers, all they do is work on the plumbing. They don't actually work on the nervous system or make the intimacy more enjoyable. They're really working on the plumbing.

Dave:

So what's the normal dose of PT-141 for a man versus a woman?

Heather:

Well, you're going to ask me milligrams. I'm going to have to get that to you again. Because I've been using the same company for so long that I'm using units, which is half of an insulin syringe.

Heather:

I always tell both men and women to start very, very small. Just like melanotan, there's a little bit of a higher incidence of nausea, mostly with women using PT-141. It doesn't mean it can't be corrected and it can't be treated but you want to know if you're going to be nauseated with a 10-unit dose, not a 30-unit dose. For men, the same thing, there actually was a documented, at least one documented case of significant priapism from PT-141. Just too high of a dose.

**\*PT-141 RECOMMENDED DOSAGE.** *Note this information is suggested only; please work with your own healthcare provider on dosage that may be right for your personal health.*

PT-141 is listed as 10,000mcg/ml (which is also 10mg/ml) and male dose typically ranges from 1mg to 2 mg, always start with 1mg and female dose anywhere from 1mg to 3mg.

Dave:

That's something I've always wanted to try. Just kidding.

Heather:

A trip to the emergency room with-

Dave:

I know. Sorry, I was just in my seventh grade self for a minute there. I just had to say that.

Heather:

So, I mean, it was obviously six hours and they needed to go the emergency room and have a procedure for that. So but anywhere from 10 units up to 30 units. Usually, most men are between 10 and 20 units

and that's their sweet spot. But a lot of women are a little bit more refractory and as long as they're not nauseated, which is a huge mood killer, they can go up to 30 units.

Dave:

I had to go grab a bottle of water really quick, but I thought I would also grab some syringes here. By the way, if you're watching on YouTube, I'm waving around syringes. And I may or may not have a bag full of many different kinds of peptides. I have some here, epitalon. I was going to inject some 141 because I haven't done that yet today.

Dave:

Don't worry listeners, it does not take effect. I actually have some melanotan. I haven't done that in a while. It does not take effect right away. In fact, it's several hours. And I was going to ask you because it might happen. Sometimes if I do PT-141, I'm opening the syringes right now. Or if I do melanotan, I get really hot. I don't get nauseous usually unless I do a big dose but I get like flushed. Like my face is red and I'm kind of like sweaty, what's going on with that?

Heather:

I think that's just a local histamine reaction that happens with growth hormone secretagogues too. And it's usually, again, 10-15 minutes and then it goes away but you can get quite hot.

Dave:

So a little bit of Ben & Jerry's would fix that if it bother me.

Heather:

It usually does, yeah.

Dave:

I have a vial of a certain compound here and this is PT-141. I'm not going to be promoting any one supplier over the other because, well, you got to do your own vetting and work with your doctors and stuff like that. So now I'm drawing up a little bit. I wasn't planning on doing this but you just inspired me.

Heather:

Well, I'm happy I'm an inspiration.

Dave:

Drawing up a little bit of melanotan here, just into the vial. And I know how much water I put in this so this is about the right dose for me. Now I'm going to do something really cool. I'm going to use this paper towel soaked in alcohol. It's like a little wipey that a proper doctor would use but I'm a biohacker so I can use a paper towel with alcohol on it, because the difference is, there's no difference. Am I right?

Heather:

You're right.

Dave:

Okay, I'm going to do on the back of my arm here. By the way, look at those guns. I did a thing on electrical stimulation yesterday, we shocked the crap out of my biceps for two minutes, and oh my god, they hurt today. So I'm looking all well-defined, but don't worry, it's all fake. And I'm going to stick the needle in here. And it sounds really bad but it simply doesn't hurt to put a needle in. How's my technique? You can't even tell because I'm off the camera.

Heather:

I think you're looking very good. You want to make sure that it's at a direct perfect little angle.

Dave:

You like it going straight in?

Heather:

Yeah, you put it straight in. Otherwise, sometimes if you don't, the needle is so small that you can end up with a dermal injection rather than a subcutaneous. And that can cause itching and irritation, but I thought you did a great job. Those are very nice guns.

Dave:

Well, gee, thanks. I was totally, totally joking. They were actual bodybuilders and people who spend way more time than I do. Well, I'm happy with my almost muscular physique.

Dave:

A lot of people have actually taught me in different doctors offices, you want to go in at about a 45-degree angle if you've got at least a one-centimeter needle, but I never could get an explanation for why. You certainly don't want to be like a skin popper under the skin.

Heather:

No.

Dave:

But you're saying go straight in. Now, I'm totally confused.

Heather:

Yeah, I mean, if the needle is really small, if you have a half-inch needle, you have a lot more room to get under the skin. But if you're using an insulin syringe, yeah.

Dave:

Just for people looking at this on YouTube. Let's see if you can see that.

Heather:

That will most likely go all the way underneath the skin. One of the things that I found is after injecting a certain area over and over, there's kind of this little semi fascial layer that's in the dermis that will tent underneath the needle if the needle's not really sharp. Like you have to pass the needle through the

rubber stopper on your bottle, and if somehow the needle isn't sharp enough to go all the way through, there's a little tinting that happens.

Heather:

I looked at this under ultrasound because I was fascinated by-

Dave:

Oh cool.

Heather:

... by people that swore they were getting these little welts or something from their injection site. And they just weren't popping the needle all the way through that little layer that sits in the bottom of the dermis. We're all made a little bit differently, some people really, they just need to get it all the way through. And if you're at an angle, it makes it easier to get it into the dermis rather than in the subcutaneous tissue, which is where it truly belongs.

Dave:

How many of your patients have a hard time injecting themselves?

Heather:

Many, many.

Dave:

Is it just the first time or is it every time?

Heather:

Yes, it's usually the first time and some... I mean, I've actually had patients who were great candidates for certain peptides and they just, they really wanted them and they just said, "I'm sorry, I don't think I can do it." I've had patients who want to come in and see me and have somebody in my office inject them regularly.

Dave:

It's so funny. That first time, it screws with your mind.

Heather:

Yes.

Dave:

Everything you've ever known is don't allow things past your skin barrier and your body knows this. I mean every animal knows this, like nobody wants a puncture wound, right?

Heather:

Right.

Dave:

And overcoming that voice in your head is crazy.

Heather:

Well, even physicians when I'm training physicians that they get a little willie about injecting themselves so I demo just like what you did. I do that right in front of all my students. Just find an area, I show them how simple it is, and I do it in front of my patients too. When they're a little uncomfortable, "I don't think I can inject myself." I drop some saline and I just inject myself right in front of them, show them how easy it is and it seems to take the boogeyman out of it. It's really not a big deal. But yeah, the first time you just have to get past that.

Dave:

And it doesn't hurt with an insulin syringe. It's like you can't even feel it half the time. It's so trivial but man, it's that story in your head that I'm going to die.

Dave:

All right, let's talk about another just awesome peptide and one, I actually mixed up a fresh vial this morning for my wife because she ate something and it gave her a little bit of gastritis. Can you guess which peptide I'm talking about?

Heather:

Are you talking about BPC-157?

Dave:

How did you know that, Dr. Heather?

Heather:

I think that's probably my... Next to epitalon, that is probably my favorite peptide. It is unbelievable. The Croatians were the ones who did so much research on BPC-157 and we benefited from that. And I'm pretty sure that the Croatians really feel that all you really need to survive is food, water and BPC-157.

Dave:

Well, I think I'll pull some of that into my next vial because I have a little bit of tendinitis I've been working on so I'll stick that in my other arm.

Heather:

Absolutely. It is just a phenomenal peptide. It's a body protective compound. It's isolated from human gastric juice and it brings the body into homeostasis. So if you're too high on one thing, it brings you back down. If you're too low on something else, it brings you up. And it's incredibly powerful at healing tissue, healing connective tissue, even healing other kinds of tissue. We use it for cognitive. We use it for...

Dave:

Do you put it in the brain like cerebrospinal fluid?

Heather:

No, no, no. No, no, I don't put in things like that.

Dave:

Could I?

Heather:

You want to stick your own spinal fluid, that's [crosstalk 00:40:28].

Dave:

I stick all sorts of stuff in my spinal fluid. It's like, "What do you do on weekends?"

Heather:

Using it systemically, it does really, really well for inflammation every place in the body. That is my favorite peptide to use for pain, absolutely.

Dave:

It's good for pain and it was originally for gastric healing is where we discovered it. It's one of the [inaudible 00:40:50]. I literally said, "Lana, drink this." We didn't even have to inject her and it's systemically active that way but for healing Crohn's disease, healing all kinds of stuff. But in my case, all right, I can go below the elbow where my tendinitis is or I can go above the elbow.

Heather:

Just stick it right in.

Dave:

Just like right up there or down there? No one's ever told me.

Heather:

Just stick it where it hurts.

Dave:

Where it hurts, all right.

Heather:

Where does it hurt the most?

Dave:

I'm going to do it like right there.

Heather:

There you go.

Dave:

Okay. Now, this should be a painful zone. It is a tiny, it's like a human hair. I'm just going to wiggle it in a little bit. See that? Just don't pass out if you're one of those needle people. So now it's in there. I did 45 degrees again because I'm a bad person.

Dave:

Aw, okay, injecting this stuff hurts. Just because of the pressure, right? Because there's not a lot of fat right there.

Heather:

Correct.

Dave:

Okay, that is hurting a hell of a lot because it's right near the nerve.

Heather:

You can reposition your needle.

Dave:

I could reposition my needle but that would suck. That means just wiggle it around.

Heather:

Yeah, just reposition it away from that structure that gets them unhappy. Is that better?

Dave:

A little bit. I got half of it in. This is actually the most painful time I've ever done it.

Heather:

Yeah, you might just be a little too close to something that doesn't like that or the needle itself maybe or something. But BPC is just incredible and it is one of the few peptides we can take orally and it actually was shown to reverse NSAIDs, nonsteroidal anti-inflammatory drugs, the havoc they can wreak on the GI system. It can reverse that damage.

Dave:

Oh, that's cool because when people take that baby aspirin every day, which is like the worst antiaging advice ever, it shreds their gut after a while so maybe they should stop doing that and start doing some BPC.

Dave:

Now I'm actually glad I did that one. So we've got BPC for healing quickly, pain management. We've got PT-141 and melanotan for cognitive function and just the zest for life as well as bedroom activities. Epitalon for antiaging. Talk to me about pineal.

Heather:

I haven't used that peptide very much.

Dave:

Ooh.

Heather:

Yeah.

Dave:

Well, that's one that we won't talk about then. All right, so pinealon's not on your radar. How about thymosin? Is that one that you use?

Heather:

Oh yes, I love thymosin.

Dave:

Tell me about thymosin.

Heather:

Thymosin alpha 1 and thymosin beta 4 are both... I use them a lot in my practice. I use them a lot on myself as well.

Dave:

What for?

Heather:

The thymosin alpha, it's incredibly effective if you're going to start to get sick, doesn't matter, cold and flu season and if you start to have any symptoms at all, you can do a fairly large bolus dose of thymosin alpha and your immune system is so propped up that you don't even get sick. It's all over from the first onset of symptoms. It's also exceptional for inflammation, for autoimmune, all the autoimmune conditions, especially autoimmune inflammatory arthropathy, which I have. I had I should say. It's something that's extremely managed. I don't think anybody with autoimmune disease should wear that label as if, "Oh, you've got autoimmune disease. Good luck." It's not like that anymore. We understand so much better how to modulate the immune system to not have symptoms. And thymosin alpha is extremely effective at that. And it's very safe in high doses.

Heather:

It has a short half-life so if you're aggressively treating, you need to treat multiple times during the day. But in combination with the thymosin beta 4, it just tackles inflammation. It's really, really good.

Dave:

So you inject alpha 1 and beta 4 at the same time?

Heather:

I inject a lot of peptides at the same time. I'm kind of a combination peptide freak. I mean, I-

Dave:

Peptide pin cushion. Me too, actually.

Heather:

Yeah, but they work so... When you know how to combine peptides in your system, not in a syringe but in your system, then you're getting this synergy that is really incredible. And you can get that for your patients where you're not just tackling one thing.

Dave:

Yeah, peptides combine fine in a syringe though. They're just small little protein fragments. They're not likely to stick to each other and form new compounds when you're injecting them.

Heather:

They're not likely to but unless they've done the testing on stability. Now for my own self, but this is controversy. It comes up all the time. I get asked this constantly to save yourself from... If I'm using seven peptides, do I have to inject myself seven different places two to three times a day? Anybody would get tired of that. And I've talked to different pharmacies about this. I've talked to one who works with a peptide manufacturer that said if you're combining in a syringe and injecting in your body, your chances of having some cross reaction happen where something becomes unstable is very, very low. And yet, there are other respectable folks in the peptide world that say you really can change the bonding, you can change things. If they haven't been tested for stability to be combined together in a bottle, you shouldn't be combining them in a syringe.

Heather:

So there's two schools of thought on that. I tell my patients, "If it hasn't been tested combined in a bottle yet together then you may not be getting the effect you want in the syringe." But most people are combining them in a syringe.

Dave:

Here's why you combine them in a syringe, it's two things. One, it hurts less and two, syringes are plastic waste and it's just not okay. Imagine if we had 7 billion people using six needles a day, it would not scale.

Heather:

No, I don't disagree with you. And I think that it's a good platform to ask for more stability testing so that we can combine peptides and feel very comfortable that your investment is safe.

Dave:

I feel like maybe I'm wasting 10% of efficacy if I combine them. But in terms of safety, I don't think I'm taking any risk at all just based on how stuff works.

Heather:

I agree with you. I don't disagree with that.

Dave:

There's something else that I want to offer to you into the world as a best practice. So you have to throw away your sharps when you're doing injections and you don't want to hurt people and get them stabbed and all worried. So what you can do, I have a syringe right here and I have a pair of wire cutters. So only the sharp part has to go into your sharps container where it gets incinerated, the rest of it can go in the recycling bin and you can actually make something out of it. So you can literally take wire cutters and you just cut your syringe off right in the middle of the plastic tube. And when you do that, you end up with the sharp part, you can put in your sharps container. You only need maybe 10% as many sharps containers, which are also plastic, and the rest of this is fully recyclable. So save the planet a little bit of stuff that doesn't need to be in landfills by doing it the right way. Have you ever seen that before?

Heather:

I have never seen that before but I love that.

Dave:

I thought of that myself.

Heather:

That is excellent. That's why you're such a genius. I love that. I will definitely share that with patients and everybody else because you're right, it is very wasteful.

Dave:

The side benefit is that we all know that grip strength is a measure of age. So here's my digital grip strength meter right here. So if you can actually make sure that you're strong enough to... What did it say? It says that my grip is too strong for when you're 18. I don't know. Actually, I didn't hit start. See how I do in my digital grip strength meter. Here we go, ready?

Dave:

After a peptide injection, 126.6 pounds. Yep, it says that if I was 18, I did good. Anyway, if your patients can't squeeze wire cutters, then you know that they need to do peptides so they can squeeze the wire cutters to cut the needles.

Dave:

So getting a little bit distracted here. But the point is, these things are pretty darn powerful and we don't have to waste needles. So my recommendation is to do what I do, which is unless you know that it's unsafe to mix these things given that your body mixes peptides inside itself all the time, it's probably okay, it's what I do but people have to do whatever the doctor says.

Dave:

Okay, what are the peptides? Am I missing here? We got thymosin. We got PT-141. We got epitalon. We got melanotan.

Heather:

I think near and dear to your heart also and what you really, I thought in Super Human, you did such a great job of explaining really technical things to nontechnical people when it comes to mitochondria and

cellular energy. We have some really exciting peptides. One of them isn't even out yet. It's supposed to be available in March. But it is a mitochondrial peptide.

Dave:

Whoa.

Heather:

Yes, it is SS31.

Dave:

SS.

Heather:

SS31, and it helps disregulate the production of mitochondrial free radical production. So the mitochondrial-derived reactive oxygen species and is therefore being looked at as a global antiaging molecule. And it's going to make its debut in March. But there's been a lot of buzz about this peptide especially in combination with the 5-amino 1MQ, which is another one of my favorites.

Heather:

5-amino 1MQ, it's a capsule, which is kind of nice to take a break from injecting. And its real target is it's a nicotinamide and methyl transferase inhibitor. And so it, not to get too technical on it, but you're improving your autophagy of especially muscle cells that are no longer serving you. I love the term zombie cells.

Heather:

If you have zombie cells, they're not serving you anymore. The 5-amino 1MQ not only improves cellular energy, but it's also flipping that switch to either take a cell that is sickly and get it back to a normal functioning cell or allow the autophagy to happen. But interestingly about this peptide is when you take it, you feel really good. You notice less body pain, more focus, more energy, your own physical capability is better. You can [crosstalk 00:51:05].

Dave:

5-amino 1MQ, one capsule at morning?

Heather:

5-amino 1MQ. Well, the studies were really done with three capsules a day like morning, noon and evening. I usually recommend people start with one because it can increase hunger. That has not happened to me but there are quite a few people that noticed that they do feel a little more peckish or a little more hungry than they normally do.

Heather:

I practice intermittent fasting and I think that keeps my craving really... That's just not something that I've had a problem with since I've been practicing intermittent fasting. But that's been reported as a possible side effect. But everybody that uses this peptide, and it's really designed to treat, it's going to

sound kind of silly but diet-induced obesity. So there's not so many forms of obesity but that's how they kind of state it.

Heather:

So it's a great little peptide, very low to no side effects other than some people reporting increased hunger. And it's palpable. It's kind of nice. One of the things that's nice about melanotan is you really see it working. It's very obvious that it's doing something in your body and not everybody is as sensitive to feeling the changes of these things, at least not right away. Everybody will notice after using peptides for a certain period of time, but there's just somatic symptom. There's a noticeable difference in how you feel, how you think, how you sleep. It's a pretty powerful reinforcement. And 5-amino 1MQ is one of those. It's a very exciting peptide that has so many applications.

Dave:

That is one that I have not experimented with. I've heard about it, but you've encouraged me to go find some and give it a shot and I'll definitely be doing the SS 31 as soon as that comes out because the mitochondrial peptides are very exciting. Anything that makes mitochondria work better is a good deal.

Heather:

That's exciting. Please tell me how it goes for you when you use these peptides. We'd love to know.

Dave:

I will. It can be a little bit overwhelming to think about okay, there's all these cool peptides. Dave, I thought I knew my vitamins, I know about calcium D-glucarates in the liver. That's one of my big favorite ones that people don't talk about often enough and I know about glutathione and vitamin A and vitamin K have to go with vitamin D. I've done my basic supplements. I know the difference between magnesium threonate and magnesium oxide and I know which one is not very useful.

Dave:

All right, so if you're there and everything I just said made sense, congratulations. You've been listening for a while or you read all my books. I love you. And if that was enough to make your eyes get big, that's okay. There's experts you can hire or you can read a book, do the work. But then, we just dumped a whole bunch of new knowledge. Some of which is in Super Human but I did not write about LL-37 or 5-amino 1MQ. In fact, I know how to spell those but you might not and that's okay, because there's two things. Number one, there are always show notes on [daveasprey.com](http://daveasprey.com) so you can just go there and all this stuff is transcribed. I'll link to it and all that sort of stuff. But what's even more cool is you can go to [drheather.net/dave](http://drheather.net/dave) and she's put together top 10 things you might want to do with peptides for fun and profit. Is that the name of it, really?

Heather:

No, it's just top 10 conditions peptides might treat. I like your title better though.

Dave:

But basically, what you can do with peptides. And so I think you should download that if you want to get sort of the 101 on peptides and that's worth your time. You're not charging for it. We don't have any

sort of weird affiliate deal. You just did something nice because we talked at A4M and like, "Oh, people would like this."

Dave:

But it is, on the other hand, a greedy grasp for someone's email address so you can email them again about peptides, isn't it, to educate them further?

Heather:

If they're interested. Yeah.

Dave:

Of course.

Heather:

In my website, you kind of let me know if you're interested in that, but we do it on the website so we kind of know that you're coming from Dave but this is for you, guys.

Dave:

Of course. Yeah.

Heather:

So I promise that if we have your email address, I will never give it to anybody else or ever use it inappropriately or anything like that.

Dave:

No.

Heather:

I don't like it when people do that with mine.

Dave:

By now, most people listening to the show have figured out, "Look, I'm not going to send them to douchebag people." And if you care about peptides, you're interested, get on the list. You'll probably share some more interesting stuff and they always know they can unsubscribe and it's the same thing on my list on Dave Asprey. I send out the latest stuff I write and if people don't like what I write, then they probably won't read the emails or they'll unsubscribe and I would want them to because last thing I would do is waste someone's time. That's not good.

Heather:

Right.

Dave:

Well, I think this episode has been a great use of time because we talked about what are peptides, what they can do for us. Pretty much every man and woman who has thought about it is probably saying,

"What's that PT-141 stuff again that makes you younger, healthier and you wake up with a kickstand? All right, I want that one." And then they're like, "Oh melanotan. I get a tan without having to be in the sun and get wrinkles. Okay, a checkbox on that one. Thymosin, I want to have the young person's immune system, check. And BPC, I don't want to be in pain, check."

Heather:

There we go.

Dave:

Here's the deal. These are cheaper than pharmaceuticals. They're cheaper than some supplements, high-end supplements, but like they should be a part of your daily or weekly practice. And so I truly believe that is why I've written about them. I've been doing this for a long time and injecting yourself with a tiny needle is a trivial nonevent.

Dave:

Final piece of advice other than to download Heather's guide here is that if you're really seriously freaked out about needles, go get some EMDR. EMDR, eye movement dissociative response. That is a form of therapy. It will take one or two sessions. The therapist will move your eyes till you're in reset mode. And you can probably stop being freaked out about needles. It's not that big of a deal.

Heather:

That would be excellent. And for any physicians who are really interested in peptides and haven't really found the training that seems to suit them, go to the same [drheather.net/dave](http://drheather.net/dave) and for physicians, I actually am going to give you a free protocol in one of the peptides we talked about today, the Full Monty protocol. So I want more doctors to really feel comfortable prescribing peptides so that more of your patients and more people in general will benefit from them.

Dave:

Now, if I'm a semi-professional, unlicensed biohacker, and I wanted to see the doctor's protocol, what's stopping me from getting it?

Heather:

Well, I'll make sure that you get it as well.

Dave:

All right, just checking.

Heather:

Yes.

Dave:

And everyone else, you really shouldn't say that you're a doctor when you go to webpages to get the good stuff, so please don't do that. That would be very wrong to say that you're a doctor to get that one and then unsubscribe from the doctors list and just be subscribed to the other list, you should never do that.

Heather:

Well, it wouldn't be the end of the world because it's very technical, so when I give the protocol for people who aren't in medicine, it might not be very interesting, but you're welcome to take a look.

Dave:

Awesome. It's the same thing. You go to WebMD. They're like for doctors and then for me, I'm like, "Oh, that's what I wanted" and for everyone else like, "Warning: This drug comes in a pill, you could choke on the pill." Guys, come on.

Dave:

All right, Heather, it's been fantastic having you on the show to talk about peptides and kind of what they do and how you got there from hormones. And I'm very, very convinced after five years of using them that they're a very powerful part of antiaging medicine and I wish that we would just get more of them approved and out there faster and your work training doctors is important for that. So thank you.

Heather:

Thank you. It's been such a pleasure and thank you so much. And thank you for having me on to talk about peptides which is a huge passion of mine. So it's been wonderful.