



## **Transcript of “Hacking Your pH, LED Lighting, and Smart Drugs with Steve Fowkes Part 2”**

Bulletproof Radio podcast #95



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Dave: Hey, everyone, Dave Asprey, Bulletproof Executive Radio. You're listening to a special episode. If you caught the last one, in fact, if you're haven't caught the episode before this one, you need to go back and listen to it, because this is part two of my epic interview with Steve Fowkes who doesn't like it when I call him a bio-hacking badass, even though that's what he is.

Steve Fowkes is the Head of the Cognitive Enhancement Research Institute. He's an adviser to the Silicon Valley Health Institute, the anti-aging research group that I'm coming out in Palo Alto. We meet every month. You can actually meet him there, SVHI.com.

He also runs ProjectWellBeing.com where he blogs. Steve has a background with nutritional supplementation. He's a biochemist. He and his work literally saved my career in my mid-20s when my brain started shutting off. It was his writing about smart drugs and mitochondria that helped me get myself to the point where my brain worked and I could use it to hack the rest of my body.

I owe Steve a debt of gratitude. You heard all that on the last episode already, so I'm cutting it short, his accomplishments, so just listen to this. Go back and hear the first one if you haven't already done it. If not, Steve is back. We're going to talk smart drugs. We're going to talk more about lighting, and we're generally going to have a good time. Steve, kick it off. Let's talk lighting.

Steve: I think lighting is one of those departures from a lot of ... a real life world that we've lost our connection to light. We've lost our connection to magnetism. We've lost our connection to food. Every time we depart more and more from our roots, our biochemical and biological roots, we end up getting into problems.

Lighting is a really great thing to do, because it's relatively easy to do. If you really want to be geekish about it, you can get into very, very nice aspects of LED technologies and stuff like that. If you like toys, you can certainly do that with light ...

Dave: Let's talk toys, \$30, Costco. I have a strip of LED lights here above my desk, and I'm holding this up. If you're driving, you don't see this, but if you're here, you can choose brightness and intensity, and you can choose color spectrums. Right now, you see I have kind of a reddish hue. I've got red lights on, but if I want it to be like purple ... because you have to aim it at the lights. They are not kind of purple. You see the ...

Steve: Uh-huh (affirmative).

Dave: There are all changes. At the touch of a button you can go in a more of a yellow spectrum or just bright white if that's what your mood. It's relatively dim right now. Some people know that you can, say, use a blue light in the morning, which will shift your ... making you more of a morning person. If you're traveling, jet lag and all, you can get some benefits from that. If you listen to most of my podcast, I'd probably mentioned something and a lot of them about amber light at night. Cut down your blue spectrum at night so you can go to sleep.

These new technologies that are dirt cheap allow you to do stuff with colors that really wasn't achievable five years ago. The intensity and brightness of the LED is there. Steve, as a bio hacker and master of all sorts of strange knowledge, what colors when are optimal for people want to kick more ass?

Steve: Well, if you're in harmony with your day, and your biorhythms are in phase with the light-dark cycle, you want to have red light in the morning. It needs to shift towards blue in the middle of the day and for most of the day, blue dominance during the middle of the day, and then it phases back

down into red again as you prepare for sleep. It's sunset. This is the natural cycle.

Now, if you're out of phase with the day, you're a night owl or you're a morning lark, then you probably want to push those elements to kind of nudge yourself back into alignment with the day. For example, if you wake up poorly, you're a night owl and you wake up poorly, you really want to do red light first thing when you wake up. Set up some red lights above your bed, kick off your covers, turn on the red lights, and bake your body in red and infrared photons.

That will turn on your mitochondria. It will improve your circulation. That surge of energy that you will get from that red light is the same thing that you would get by, for example, in getting bullet-proof coffee, or taking some coconut oil, or some MCT oil or doing some exercise. That creates an acidic momentum that moves you into the day. The earlier you do that, the more you'll tend to adjust your cycle into the harmony with the normal daylight cycles.

Dave: Why does the Philips goLITE ... Why do they put a blue light in the morning? I always thought that was a bit odd. What's the rationale to that?

Steve: The blue light isn't the problem. It's just that it has to be red. You can do ...

Dave: (Laughs) The blue light is not a problem but ...

Steve: [Inaudible 00:05:12] bed at the same time

Dave: Okay, got it.

Steve: As long as the red photons are there.



Dave: Right, and they aren't in those lights.

Steve: At night time, the blue messes with your melatonin. In the morning, you don't care if your melatonin gets suppressed. You actually kind of want it to be suppressed.

Dave: Yeah.

Steve: The blue light in the morning is fine, but you have to have the red lights. If you do fluorescents in the morning, it's not going to help you. It's going to damage you.

Dave: Yeah. Fluorescent lights are just bad all the time as far as I can tell.

Steve: Yeah.

Dave: It's kind of funny. Now, above my bed, I have a marijuana grow light, an LED grow panel from Amazon, which is all red LEDs. It's a really bright one. I use it at night sometimes if I want to read, and I use it in the mornings. I do find though that after I get out of bed, that turning on bright halogen lights, which have white, a lot of white and blue, seems to help, but getting a dose of the red is a good thing.

Steve: Yes.

Dave: You're doing it because of its effect on mitochondria?

Steve: Mitochondria. Same effect.

Dave: [Inaudible 00:06:20] respiration.

Steve: Okay.

Dave: That happens through something called "cytochrome b" which is part of the mitochondrial lining and reserves, isn't it?

Steve: Yeah. The electron transport chain cytochromes absorb infrared and red photons, and because the amount of energy that you get out of the oxygen, hydrogen redox potential, there's a certain amount of voltage there.

Because we get, let's say, 70% of that energy out, there's only 30% of the energy that's driving the cycle, which means that it makes a huge difference as to the dynamics of putting small infrared photons, and they don't have much energy, but putting them into the cycle to help move the electrons down the electron transport chain gives you more ATP. It makes your mitochondria more efficient. That's part of the way in which mitochondria normally operate.

They're normally bathed in a light field. There are always photons coming in from the sun for being out in the world. Our mitochondria are optimized for being in that kind of environment. We don't have that anymore. A lot of people are weak in that area.

This is one way to encourage it is to say, "Okay, while I'm in bed in the morning before I get out of bed, I'm [inaudible 00:07:42] body, and read the newspaper, read a book or something while I'm laying there with the red lights on me." You can set it up in your shower, so that it does not actually take any extra time. You just put on the red light when you're in the shower. You do the shower thing. You have the red light from the front and the back, so you're getting, and hopefully, you're not enclosed in the shower.

Dave: (Laughs)

Steve: Your skin exposed.

Dave: [Inaudible 00:08:05] what you drink last night.

Steve: It may be an issue if you sleep with flannel. The issue of taking off your clothes so that you get direct light on your skin ... It really is important to do that. The penetration ability of red light is inches, and the penetration ability infrared light is many inches. There are medical lasers that can actually treat your spine through your stomach.

Dave: I have one, a medical laser that does that with infrared and actually ruby, two different heads on it. I have that for almost 15 years now. It's shocking what you can do with light like that.

Steve: Yeah.

Dave: How long do you do this for, Steve, in the morning?

Steve: Three to five minutes.

Dave: Got it. I notice a boost at night. I sleep better when I have the red lights ... I believe it's because ... I know for sure that, with my mitochondria working better, I sleep better, because ...

Steve: It's also the case that darkness produces an adaptive response. If you are not having red light, your dark adaptation mechanism kicks in earlier, and that involves, on a major level, cortisol, which is lowest at dusk and then rises during the night to peek at dawn. That's a dark adaptation mechanism.

If you do a graceful photo bathing from blue light to red light before you go to bed at night, that's when your cortisol starts rising. Then, if you expose



yourself to red light in the morning, that's when your cortisol starts dropping. You're, in a sense, bracketing your cortisol, so that it doesn't bleed into other parts of your life when it would be a cumulative deleterious effect.

Dave: That is cool. I didn't actually realize that I was bracketing cortisol that way. I didn't look so much to red lights and cortisol. I looked at not having blue light at night and melatonin and reducing cortisol.

The other benefit of red light, and the reason I started with my grow light, is that red light causes collagen synthesis, which is particularly cool. If you want to have healthier skin ... You and I both are huge collagen fans. I will ask you about that in a minute. Making more collagen when you have enough vitamin C and you have enough collagen peptide in the body is just a good thing.

I used to mount the grow light actually by my feet in my office. It's a panel that's one foot by one foot, but it must have 75 LEDs or something on it. I did move it up to where I sleep, because I thought it would be kind of cool. Have you ever slept with red lights on all night?

Steve: No.

Dave: Why would you not want to do that?

Steve: I don't know why, but it's just not something that would happen in nature, so that would be my inclination is to say it's a departure from nature, and so they don't have any evidence that this is a good thing. I'm inclined not to do it.

Dave: I'm looking at that antiquated ... I think it's a museum piece of a computer behind you there, Steve. That's a departure from nature and you do that, I mean where's [inaudible 00:11:02]?

Steve: I do red lights when I work on a computer at night.

Dave: Yeah. Okay. It's the same here that I do. For people who are ...

Steve: The idea is that if red light is antidote for blue light, and so you just use it therapeutically because I'm just not willing to give up the computer.

Dave: It's not me either. I mean, we've got to have standards here. I'm going to grab another light to show people. Give me like five seconds here. This is the one that I wanted to show. This is the \$12 light from Amazon. It's a color-tunable LED flood light. It's \$12, comes with the same remote control. You can pick the color and everything else. I did a really good job there with the electrical tape of putting the power cord on there.

Steve: Yeah. High tech.

Dave: Yes. Super-high end. It's kind of cool. You're talking \$12 bucks for a floodlight or around \$29 for a strip light that will run all the way across your desk back and forth and even under your desk if you want. It's become frighteningly cheap and it's so [inaudible 00:11:59]. Press the button and you get your red light.

You want a blue light or you want purple because you're feeling special? It doesn't matter. This is something that I believe is going to have far-reaching effects on people's biology, and it just now became available. Before this, you had to put color filters on your lights and they would smell. It was just a pain. This is an area of bio hacking that deserves more attention. Of course, you're on top of it more than I am, Steve, which is ...

Steve: Yeah.

Dave: How do you do that?

Steve: I also encourage the really, really, really, low tech side of it as well, which is an ordinary incandescent heat lamp.

Dave: What? Incandescent light?

Steve: That's right. Incandescent light, 250 watts.

Dave: They have no mercury. They don't have a curly thing in them. They're not made in China. Come on. [Inaudible 00:12:45]? Yeah. The stuff your grandmother had in her bathroom to stay warm is red light. Those work perfectly fine.

Steve: There is a problem and there's a limit how much red and infrared you can get into you because of heating effects. You don't want to ever heat the skin up enough that you start sweating or that you feel uncomfortable. That just generates heat shock proteins and other inflammatory mediator. The idea is you want the bulb to be far enough away that, when you put all your covers off and you're naked in the morning, for example, that you're warm.

Dave: Okay. How about that? Now, here's a question for you, though. I take this red light ... This really bright red light I think is a 30 watt LED, which is substantially powered. I put it up against my abdomen. I'm actually increasing mitochondrial function in the gut specifically, and that thing is going to penetrate essentially all the way through you.

I'll do that for five to 10 minutes and you can feel a difference in how parts of your body work. I put it over sore muscles and things like that. There are definitely people out there doing research with these on how the levels of light affect mitochondrial function. Do you think it's potentially advisable for, say, an athlete, someone like that, to maybe use a red light in a more concentrated way on the body?

- Steve: Sure. It's a wide open realm for study and it makes sense to me that anything that makes mitochondria more efficient can have profound effects.
- Dave: This is another LED light, but this one is a camera illuminator, 850-nanometer light. This one reaches very far into the body and really turns on mitochondria to the point that you could probably harm yourself greatly with it. If you do it for a short period of time, it causes hormetic improvements in mitochondria. It's like weightlifting for mitochondria.
- Steve: That would be highly adapted to let's say that kind of therapy in a medical office where they would want you in and out in seven minutes.
- Dave: Yeah. In fact, I think seven minutes is too much. I've done five minutes with this light. It knocks me out for a whole day.
- Steve: Okay. Two minutes for them to come in. Three minutes [inaudible 00:15:01]. Two minutes to exit.
- Dave: Yeah. I haven't talked too much this except in a couple [inaudible 00:15:06] presentations. For 15 years, I've had a far infrared stimulator that I've used on my brain at various times with huge effects. Now, it's becoming more mainstream, but this is one of those types of hacks that people ... Oftentimes, it sounds too good to be true. It's a high tech flashlight on my head, but you just went into the mechanisms which is awesome. I didn't know we're going to talk about that today, but it figures it would [inaudible 00:15:32].
- Steve: There's another benefit that we should also mention and that is that the sinuses are one of the first places that your mucous membranes get contact with allergens and infectious agents. You can try and red light up into your sinuses to augment any existing defense in that level.

- Dave: All right. I've got my nasal light. You have one of these, don't you?
- Steve: Yeah. The Rudolph the Red Nosed [inaudible 00:15:59] or ...
- Dave: These things are actually designed to put in your nose, so yeah, I've been playing around that as well. Is this ...?
- Steve: It's good at parties, too.
- Dave: It just clips around your nose. This is why you should get to YouTube or to iTunes version. You stick it into your nose. It is so sexy, like the women at parties, they just go for it, right? When you put a light in your nose like that, you're doing this for energy? I always did because I'm illuminating the bottom half of the brain and I'm looking for mitochondrial activity in sinuses. By the way, a background, I had sinus infections every month for 15 years before I fixed all this.
- Steve: Yeah. I had the same problem.
- Dave: You did? Okay, so what's the mechanism of action of a red light in the sinuses?
- Steve: I think you're waking up your mitochondria in your sinuses and doing ... improving energy presentation mechanisms and immune system responses and white blood cells and invading the mucous layer. I mean all kinds of things.
- Dave: Okay. Now, we both sound like circus freaks at this point, but I'm okay with that because the benefits of this kind of stuff are there. They're real. This is stuff that medicine has largely ignored, that there's some cold laser applications, some physical therapists and chiropractors are doing stuff, acupuncture points.

I mean, come on. This is dirt cheap. You can't sell it with a prescription that you have to refill every month. It's not good for business at all, but it's good for us. I'm particularly intrigued by this kind of stuff. It sounds like you are, too.

Steve: Absolutely.

Dave: Wow. We should have scheduled a whole session on this. We could have both [inaudible 00:17:34] strange lights up each other's noses.

Steve: Oh, that's enough lighting, yes, but ...

Dave: All right. Let's switch gears. I want to talk about another subject where you are the man. This would be smart drugs and nutrients, too. You're the author of ... or a co-author of probably I'd say the most influential book out there on smart drugs.

There's a lot of good publications, but this is one of the seminal works for lay people to understand what they are and how they work even though it's been out for a while, but it's still solid work.

Steve: Yeah. It's an oldie by now.

Dave: It is. Let's talk about one that I know that you are a giant fan of, and that is piracetam.

Steve: It's one of my two favorite smart drugs of choice. I'm loaded up right now [inaudible 00:18:24] with it. I really like it for a variety of reasons. One is that it helps me with my verbal skills and editing skills and speaking skills. The whole language thing is something that my brain isn't optimized for.

I've got a very lateralized brain where left and right brain are doing different things, which gives me wonderful spatial skills, but really hurts me in the area of verbal skills. Piracetam allows me to bring that level up to a level of sufficiency where I'm very happy with it. There is another ... what I call a feminine trait of being multitasking, and piracetam gives me that.

Dave: Did you just say that piracetam was feminizing, Steve?

Steve: Feminine rather than feminizing. Yes, I'd like to get in touch with my feminine side.

Dave: On behalf of our approximately 40-something percent female audience, I would say multitasking is a skill that men aspire to.

Steve: It's true, or that they just lust after.

Dave: Yeah. There you go, and it's a skill that I suck at although I'm better than I was. Like you, I use another racetam. Aniracetam is my favorite. The Rolling Stone editor had the same effect. Just loved aniracetam. For me, it's a memory aisle thing. I drop words less on aniracetam than I do on piracetam. I'm right now on aniracetam stack with phenylpiracetam. I take those and still tap on other stuff on a very regular basis because life is better when your brain can do both things, right?

Steve: Yeah. That's true.

Dave: But you do wacky stuff with piracetam. You do it for mitochondrial function for an [inaudible 00:20:06]. Let's go deeper on piracetam, because you're like the master of piracetam. I don't know anyone who knows more about it than you, like literally, all the people I've ever met, you're the most knowledgeable piracetam hacker.



Steve: I discovered one effect that is fabulous that isn't in literature in the slightest and that I use piracetam to become a ... to switch from a night owl to a morning person.

Dave: Okay. You just got everyone's attention right now, like there's 50,000 slam their brakes when you said that. How do we use ...?

Steve: I have no idea that this would work for 80% or only 8% of people, but it works for me consistently every time.

Dave: Right now, every Amazon seller of piracetam just ran out of stock.

Steve: What I do is any time I noticed that I start to drift and I start to stay up late. The next morning, I take around a tablespoon of piracetam, which is probably 10 grams or something like that.

Dave: Okay. The normal dose is about 800 to 1,600 milligrams. You're taking about five to 10 times the normal dose.

Steve: Yeah. Maybe four times the total daily dose. I take it all in the morning, none of it the rest of the day. I load myself up and, that morning, I just slam it down.

Dave: It's like crack. You take a tablespoon in water. It's one of the most terrible tasting stuff when it's out there.

Steve: I dilute it in eight ounces of water.

Dave: Okay, so you chug it. I get it.

Steve: If I do it in two ounces of water, it would be horrible, but listen, I've spooned raw B complex vitamin down my throat.



Dave: I'm with you.

Steve: My taste buds are different than anybody else's on the planet. At this point, they've experienced more raw nastiness. Piracetam is mild by comparison than vitamins.

Dave: Okay. I get it.

Steve: I slam it down and that night, I go to sleep. Then, in a reasonable, the next morning, I wake up at dawn with no alarm clock.

Dave: You do it in the morning when you wake up and you don't want to stay up late. You go to sleep earlier because you're on piracetam or ...?

Steve: I actually go to sleep [inaudible 00:22:08].

Dave: Then, you wake up next morning and you're done. How many hours can you shift your schedule in one day? Can I use this for jetlag?

Steve: Well, if I stay up until two or three in the morning the next day, the following day after that, I'm up at dawn. It just automatically sensitizes me. I don't know. I haven't done more than three to four hours adjustment with this. Just because I don't travel, I don't have any experience of adding the jetlag [inaudible 00:22:36] to just being a night owl.

Dave: My next trip to the east coast, I think have one coming up within the next 30 days for sure. I have two other trips before then. I'll try a huge amount of piracetam ...

Steve: In the morning.

Dave: Yeah. I guess in the morning for where I'm going to be is the way to do it. All right. Let's see if this works. It can be a cool thing. I know you talk about that.

Steve: It will make a good podcast at a future event.

Dave: All right. Good deal. All right. Wow. That's exciting. What are the other things piracetam does that people don't know about?

Steve: It's a good remedy for altitude sickness. Anybody who gets light-headed or sleepy on airplanes, they crash into trees while they're skiing, piracetam is very, very helpful for that. I used it once on a trip to central Utah when I was at 8,000 feet. Normally, at that altitude, I'd be light-headed.

I was doing a Down Syndrome conference, so I had to be very sharp. I was doing ... loading up on piracetam. Not only was I absolutely clear, so even on the flight, I was sharp in preparing. What I got there, I felt so sharp that I took a three-wheeler up into the mountains, about a thousand feet, and followed a flock of turkeys, wild turkeys, up into the hills where I was going over all kinds of great stuff.

If you know anything about three wheelers, they're very unstable. They're just notorious and I had it under control the whole time. It's my first time on a three-wheeler maybe since I was four, five years old or something like that.

Dave: Wheel didn't count.

Steve: It was great because I was totally in control. I didn't get fuzzy headed. I didn't crash. I didn't do anything. I was sharp the whole time. Since then, I put out a message about this and other people have gone out. They live at sea level, they go up, and they ski at 10,000 feet. They say, "Yeah, we did four runs today, and then I came back and I partied all night."

Dave: It makes sense because piracetam increases oxygen levels in the brain without changing circulation. I have the stack that I use for health in mountaineering and a bunch of mitochondrial enhancers because the mitochondria's stuck up there and you want some more carbs because you burn carbs better, but phenyl ketones help so I have the whole brain oxygenated.

Steve: You don't want to get [inaudible 00:24:55] out of ketosis. Yeah.

Dave: Exactly. I think probably resistant starch might be good, the you-can stuff. Anyway, I always take aniracetam and piracetam. I remember in Tibet, I was up for a long period of time, 16,000 plus feet and sleeping above that altitude. A lot of people had to go down. Even on Diamox, they were getting altitude sickness. I was hungry, which never happens at altitude.

I just felt amazing. I never actually thought whether at that time the piracetam is part of what I do. In fact, I was on piracetam back then. I switched to aniracetam because the memory aisle effect for me is much better, but they're similar drugs and [inaudible 00:25:33] different half lives in the blood, but they're related.

Interesting, Steve. I'm so glad you said that. When you're on an airplane, it totally makes sense to be on aniracetam. When you're on a surgical table, it makes sense to be on a ... I'm not saying on aniracetam. I'm saying on a racetam. The racetam family includes aniracetam, oxiracetam, piracetam, phenylracetam, blah, blah, blah.

Go to the Internet and search "racetam." You'll find them. Why do you stick with old one, piracetam, the first one, instead of some of these new-fangled fancy ones like phenyl that ...?

Steve: One, I'm satisfied with the results. Two, the quality of the research has been done. There's way more research on piracetam than any of the

racetams, no question about it. Three, there's a dishonesty factor in the research that happens with any "me too" drug that comes along. When a first drug comes out, it sets the stage, and then all these "me too" drugs come in.

Drug companies have the power to withhold evidence and not report it. What you tend to see is this filtering of negative findings and a promotion of positive findings which makes me distrust the balance of the emerging scientific literature for those kinds of drugs. The other reason is just that I've been busy with other things and because I'm so happy with piracetam I only haven't had that much incentive to try to hack it to a new level.

Dave: That's a wonderful answer, that endless pursuit of perfection. You get a lot less return when you just nailed most of it. I'm like that on a simple fruit diet, like the new version I moved to blueberries a little it because of B, D, and F. It's pretty small tweaks at this point, but it's mostly there. I think you're right. For me, I read some studies about aniracetam that also talked about anti-anxiety effects.

I think I'm good with that when I ran my little experiment. Either one, anyone who's listening to this, if you've never tried taking one of the racetams, they have anti-aging benefits. They have cognitive enhancing benefits. If you get in some sort of weird drowning or have lack of oxygen to the brain, you won't get brain damage. I consider this to be anti-aging drugs as much as smart drugs. Do you agree with that?

Steve: Yeah, and also anti-trauma drugs. One of the things that I recommend for anybody who does a lot of traveling and automobiles is to have some DMSO, diluted DMSO, in their glove compartment, so that if there's a trauma and they've damaged their spine, damaged their back, they can just take that bottle and drink it and they protect their spine from paralysis.

Dave: DMSO or DMSO with piracetam in it?

Steve: No, just DMSO.

Dave: Okay. This is a whole ...

Steve: This is just one of those things that you can do. Taking DMSO in advance is not good because it gives you bad breath.

Dave: Yeah. It's just like garlic.

Steve: It's very, very unpleasant socially, but if the choice is having bad breath or being paralyzed, it's very obvious that you don't ... you would take the bad breath. You just want to have it on sight in that kind of a trauma situation. If you come across an accident where somebody else is injured, you might be able to give it to them and prevent them from being paralyzed. It's one of those emergency things that is very useful to have around.

Dave: It's one of the things that no hospital does, that no ambulance carries. All right. This is one that I'm not familiar with. I'm familiar with DMSO. I've used it on and off for years and MSM. What's the dilution and the dosage that you recommend for this? Because, honestly, I'll put a bottle of that in my car. I have no question about that.

Steve: Typically about one percent.

Dave: You want one percent DMSO in what volume of water?

Steve: It could be a quart, but you're going to have a hard time fitting that into your glove compartment. A cup of water with one percent DMSO.

Dave: Okay, so you drink one cup of water that's one percent DMSO? Because I'm just imagining I don't even know about oral intake DMSO, how much you're supposed to take. I've always used it topically.

Steve: That's the typical way it's been studied is to put DMSO on the surface of the spine in the vicinity of the injury to prevent the damage, but you don't have that luxury if you're in an automobile accident. You're pinned under a car or you have clothes on. You take off your clothes. You get arrested. What you do is you drink it and it goes to your spine through your bloodstream. Plus, any [inaudible 00:30:15] of your body gets equally treated if you drink it.

Dave: Wow. All right. I'm going to add that to my arsenal of cool bio-hacking tools. I do know that if I get any sort of spinal injury or any sort of situation like that, I'm happy I'm already on aniracetam. I would want to take more piracetam and I'd want to be sitting in a hyperbaric oxygen chamber really quickly, probably with red lights shining on me.

Steve: Here we go, multiple modalities. All of them low-tech, but when you add them all up, it's amazing.

Dave: If you look at that, what of those is patentable?

Steve: The combination of anything is potentially patentable, but it's a use patent so it's worthless.

Dave: Exactly. Use patents cost about \$10,000 if you go to a real legal firm. How do I know?

Steve: You have to defend the patent and prosecute the patent, and that's infinitely expensive.

Dave: Exactly. This is one of those things where the reason you don't hear about this much other than from bio hackers is that there isn't a profit motive. One of the reasons that I started the bio-hacking thing and talking about it is that there's so much of this out there.

If enough people do it and they get knowledge from guys like you and guys like me, then suddenly, it doesn't really matter if there's a company backing it up, because these things work so obviously. When you can feel the piracetam the next day, then there you go. These other things like [inaudible 00:31:36] which I started carrying on the side in the long term chemical potentiation, have you played with that stuff?

Steve: I haven't.

Dave: Okay. Cool, so we won't talk too much about that. All right. Tell me about your collagen-tryptophan cocktail, because this isn't exactly a smart drug, but it's a brain-affecting thing. Why do you do that?

Steve: Most humans can benefit from collagen because it's a weak system in humans, in the human species. We don't make vitamin C. Our collagen maintenance and production is compromised.

Dave: Just for people listening, collagen, a major connective tissue in the body. I don't mean plump lips and eyebrows or anything like that.

Steve: This is what makes us different from jellyfish.

Dave: Exactly.

Steve: You're going to take your arm and you're going to smack it. It's the collagen that prevents you from damaging the tissues. The quality of collagen prevents you from bruising. Again, weak collagen leads to bruising.

Anybody who notices that they have random bruises appearing on their body and they can't remember how they happened, you'd think collagen, vitamin C, that whole family of things. What I found was that collagen, pre-digested collagen, when you break the collagen down into absorbable pieces ...

Dave: This is basically upgraded collagen, if I may. Yeah.

Steve: Yeah. Right. When you do that, all of a sudden, the collagen does something that is very rare, and that is it's solubelized to tryptophan. Tryptophan, normally, a gram will dissolve in 30 gallons of water or something like that. It's extremely non-soluble.

You take a capsule of tryptophan and put it into a glass of water, you can stir it for weeks and it will just float on the top. It will never dissolve. You put a teaspoon of the collagen protein in, tryptophan dissolves. Not only that, but you can dissolve four grams of tryptophan in one glass of water.

Dave: Wow. When you dissolve that, when you take that collagen with tryptophan, you're going to go to sleep.

Steve: It depends on how much you take, but yes, or you can bring somebody down from depression. They're suicidal. You can bring them down. If somebody is anxious and nervous, you can calm them down. Tryptophan has all kinds of benefits like that, but because the tryptophan is solubelized, it's absorbed very, very rapidly in the digestive system. Instead of it taking hours to absorb, it absorbs in minutes.

If you warm it up so that it's actually tea that you're drinking, it absorbs even faster. It facilitates the blood-brain barrier transport of tryptophan, because the collagen protein doesn't have tyrosine and phenylalanine and histidine, those amino acids that otherwise compete with tryptophan, are not present, and therefore the gatekeeper for tryptophan transport is wide open.

Dave: Couldn't I just take a tryptophan capsule and drink some collagen and water and get the effects? Do I need to mix them ahead of time?



Steve: It wouldn't be solubelized. It would have to dissolve in your gut, in your stomach.

Dave: Will it solubelize there at a reasonable amount of time, or it's probably not ...?

Steve: Not really. If you just take tryptophan and predigested collagen protein, you put them together in the same glass of water and stir it, it takes about 30 minutes for the tryptophan to dissolve. There's a lead time for that. If you wanted to use it for anxiety purposes, you can just put the tryptophan and protein into a used water bottle and put it in your purse, in your bag, and take it with you on the road.

By the time you got to lunch, it would be all dissolved because you'd have this little bit of stirring effect that would happen. It's not like you need to stir it all the time, but the peptides and the protein have to stack on the tryptophan to make it soluble. That takes a while for that to happen.

Dave: Wow. This is remarkable. I did not know about this. This is why I always ... I miss going to those meetings, the [3HI 00:35:37] meetings. I don't get to them as regularly as I did when I lived in the Bay area, because you always know stuff like this, Steve.

Steve: That's just part of just experimenting with things, just trying things out. You've got the tryptophan here and you've got the protein there, and at some point, randomly try it and, oh, wow. Look at that.

Dave: That is so phenomenal. I've never looked at tryptophan solubility. I've looked at 5-hydroxytryptophan. 5HTP is a very well-known sleep remedy. It's one that benefits some people. Long term use is maybe tied with cancer. There's some concerns about it raising serotonin levels in the blood versus the brain. What's your take on 5HTP versus tryptophan for sleep or for anxiety?

Steve: Basically, they're equivalent in low doses for raising serotonin levels in a physiological context. Tryptophan is weight-limiting ... is weight-limited, and therefore, you can't really take too much tryptophan easily. You really have to work at it, whereas 5HTP, you can. You can overdrive the system because 5HTP is past the weight-limiting step.

It's like full-blast. In terms of solubility, they're very similar in terms of 5-hydroxytryptophan not being as soluble as many compounds are and that the collagen protein helps dissolve the 5HTP. The 5HTP is fundamentally more soluble than tryptophan so you don't need it as much.

In terms of the blood-brain barrier transport system, 5HTP is like tryptophan. It's at the end of the line. It's at the back of the bus, and so it's the last one to get on and get through into the brain, so that matters. Also, there's an enzyme that destroys tryptophan and 5-hydroxytryptophan. It's activated by inflammation. If you happen to be somebody who's in the state of chronic inflammation, neither tryptophan or 5-hydroxytryptophan will work very well for you. The collagen protein gives you a technique for sneaking it past that enzyme that would otherwise trash it.

Dave: Okay. Interesting. Maybe 5HTP is preferable for some people?

Steve: Yeah, or the collagen 5HTP mixture would be perfect.

Dave: Oh, collagen with 5HTP, not collagen tryptophan?

Steve: You can do either one.

Dave: That's interesting. Okay. I'm going to try that. I do 5HTP sometimes.

Steve: If somebody has this inflammatory issue, what they tend to notice is that they'll take tryptophan or 5-hydroxytryptophan before bed to sleep better. Even though they may sleep better, they don't wake up very well. The next

day, they feel off. I call it a kind of malaise where things aren't quite right and you feel off and your brain feels a little bit poisoned.

That's because that enzyme, indoleamine dioxygenase, IDO, burns up the tryptophan and 5-hydroxytryptophan. Those byproducts are toxic for the brain. If you take that, you take that, you take the tryptophan and the 5-hydroxytryptophan, but two days later, a week later, and you mixed it with a protein, the collagen protein, and you take it and you don't wake up with that next-day malaise, that means you have high IDO and inflammation and that collagen is sneaking it through your system.

Dave: Wow, so for inflamed people, mixing 5HTP or tryptophan with collagen before bed is a better move. You want something ...

Steve: It's a diagnostic technique, so you can actually diagnose inflammation by differential response with the collagen protein.

Dave: So cool. If you're inflamed, collagen is going to make you feel better the next day. If you're not inflamed, you won't get a hangover from it. This is really cool.

Steve: This is hacking.

Dave: If you're listening to this and you are curious about your inflammation levels, I actually recommend you get your labs done, do your WellnessFX panel, your C-reactive protein, Lp-PLA2 [inaudible 00:39:40] and C-reactive protein or whatever, all the different various inflammation markers that we talk about all the time.

On top of that, what Steve's talking about here, no lab test required. You're probably already taking collagen if you listen to the podcast regularly because it's good for you and it's going to be for your connective tissues

and everything else and it's a less inflammatory source of protein. You're already doing that. Here's the test.

All right. There's three things I recommend people do before bed, Steve, and I want you to tell me why I'm wrong. Some people really respond well to raw honey before bed. These people, the theory goes, that when you use raw honey, it raises and stabilizes your blood glucose levels, not super-high, but it keeps them stable for six or sometimes more hours, so you're not getting a hypoglycemic crash. Your brain works better because it's properly fueled at night.

I often tell these people, while you're at it, throw some Brain Octane in there so you have some ketones present as well. Some people just do fine on plain Brain Octane. Some people want honey in Brain Octane, different brains like glucose. Different brains like Brain Octane oil.

Then there's another group of people who benefit from having collagen before bed and some of them do collagen with Brain Octane. The idea is some people want the amino acids and the energy from the fat. Some people want the energy from the fat and glucose. Some people just want glucose. It seems very individualized, [inaudible 00:41:04] one thing that works for everyone. What are the pros and cons of each of those?

Steve: They all make sense to me. I mean raw honey has not only that blood sugar stabilizing effect, but has two other effects. One is it's anti-microbial and therefore, if you have a sugar-fungus interaction, candida, for example, where when you eat sugar, you're going to get fungal mycotoxins that are going to be produced in your gut. The honey will tend to inhibit that.

Dave: Especially the Brain Octane, right? Caprylic acid has pretty [inaudible 00:41:37] effect.

Steve: Also, the honey, any time you raise your blood sugar above the normal level, you're going to get an enhanced tryptophan into the brain to produce serotonin. This has to do with the fact that the sugar stimulates the liver to store tyrosine and phenylalanine and histidine, those large, neutral amino acids. When the blood sugar is up, they tend to be stored. Therefore it alters the ratio of amino acids to facilitate tryptophan, builds up in concentration, and then it flows into the brain better.

Dave: You would put honey into the collagen-tryptophan mixture to rock the way it works?

Steve: You could, but my concern is that any sugar-mediated way of augmenting tryptophan has a byproduct of producing insulin resistance, which is a big downside.

Dave: Yes. We don't really want insulin resistance.

Steve: We don't really want that. Yeah. In terms of ketones, yeah, the brain gets used to ketones. Some people can get revved up on them. It might keep them from sleeping or having them sleep with violent and dynamic dreams. That would be my concern that somebody would probably need to be in some level in ketosis a lot of the time to handle that gracefully.

Collagen is missing tryptophan, so it's not only missing tyrosine and phenylalanine and histidine. It's also missing tryptophan. But if you took the collagen mixture a little bit of tryptophan in it to replace that one that's missing, then I would guess that you will get phenomenal sleep with extra [inaudible 00:43:11] sleep aid.

Dave: Okay. That makes great sense. In terms of using the Brain Octane oil before sleep or ketones, any downside of that that you know about?

Steve: Oh, yeah. You'll rev yourself up too much. That's too much energy.

Dave: Oh, yeah. Some people can't sleep because they're so ...

Steve: That's right. Yeah.

Dave: I get that.

Steve: It's just like you're sticking your finger in an electric socket. You're not going to sleep.

Dave: If it's that stimulating ... for me and a lot of people, having better mitochondrial energy equals better sleep because there's something ... I'm sure you know about this, but for our listeners, there's the lymphatic system. We just figured out that the cells in your brain, they drain their fluids at night and it gets pumped out through your cerebral spinal fluid and then they re-inflate.

This is one of the toxin-removing things. It uses mitochondria to do that. I found that my ability to get less sleep and feel amazing in the morning is tied to mitochondrial activity. The stronger my mitochondria, the better I feel, then the less sleep I need in order to feel restored the next day. I can go to sleep in three minutes. It doesn't matter what's happening because I have control of my sleep cycle, so there you go.

Steve: There's also a phenomenon that's been noted in some of the chat rooms of people who are taking thyroid hormone where they're now taking a fraction of their thyroid hormone before bed at night on an empty stomach and having better sleep.

Dave: That's an obvious a mitochondrial. It's obvious to me. I may have to try that. I'm down to almost no thyroid. I used to take quite a bit and I'm down to 2.5, whatever, micrograms, of T3. It's the same release, very low dose, and I'm not even taking T4. I used to take 10 instead of 2.5 and I took 100

of T4. I'm almost done with my thyroid meds, but doing it before bed, thanks for reminding me of that.

A lot of the people listening to this are on thyroid medication and a lot of them aren't but should be. If you're listening to this and you have brain fog and you're tired and slow and things aren't working right, you're cold when your friends aren't cold, it's time to start bio-hacking your thyroid function for sure. All right. Let's see here. What other things do we have time to talk about? We have about ...

Steve: How about T3 in the morning to wake up to? Instead of coffee, T3. For those people who can't tolerate the MCT or the butter or the coffee, they could take a small of T3 in the morning as a coffee substitute.

Dave: I actually wash my T3 down with the coffee. Any downside to that?

Steve: If you're not climbing the walls and your wife doesn't divorce you, it's okay.

Dave: Of course, you need the Brain Octane for more energy. I've got uses for this energy now. All right. Let's see. We don't have time to go into vitamin C or DHB, which are the other two things I would love to pick your brain some time. I'd love to have you back on, Steve, and maybe next time I'm in the Bay area, we can actually set up a camera and do this live in person, which would be the most fun. We'll set it up, but you're always welcome.

If there's something you want to share, just drop me a line. You're welcome on the show like you're one of the guys. There's a lot of doctors who know little, like they know this thing and they know this thing. But honestly, if I'm stuck, the first guy that I can think of to call is you, like, honestly, it's going to be obscure and you're going to know it. I don't know anyone else with that level of just broad range of knowledge. A lot of respect and gratitude.

Steve: [Inaudible 00:46:46].

- Dave: Yeah. Thanks for being on the show and thanks for the work you've done for way longer than I've been doing any of this stuff. Tell your people your URL and where they can find out more about you. You also do individualized coaching for people, right?
- Steve: I do. You can get in touch with me at [ProjectWellBeing.com](http://ProjectWellBeing.com) and go to the Steve page. All my contact information is there, links to other sites and books and stuff. There's a free book on there, an antiviral therapy that you can download. One page you're in thyroid hormone. It's all there in that one page. That's the best place to go.
- Dave: The interesting that people should know about you, Steve, is that, aside from being a national treasure at bio-hacking, is that you're very accessible. If you go to the third Thursday of the month at 7:00 p.m. at the Cubberley Community Center in Palo Alto, just go to SVHI, as in [SiliconValleyHealthInstitute.com](http://SiliconValleyHealthInstitute.com).
- Steve: Dot org, I think.
- Dave: I think we have both, dot com, dot org.
- Steve: Dot org.
- Dave: You can go there and you can learn how to get in there. It's five bucks to get in. There will be a lecture from someone who knows about something interesting around bio-hacking. Steve will be there along with a few other guys who are of similar types of knowledge. There's a community forum for half an hour. You can just ask questions and Steve will explain anything. I learned so much. A lot of my bio-hacking has come from this community of experts. They're all there and Steve is one of them. It's one of the things that I miss most about the Bay area now that I'm living up here in Canada.
- Steve: In the wilderness.



Dave: All right. In the wilderness. Exactly. There's a question you're not getting away without answering this. It's one that every guest, except for one when I forgot, have answered. The question is what are your top three recommendations for people who want to perform better, people who just want to kick more ass? It doesn't have to be supplements or drugs, even your life experience. The three most important pieces of advice you have for someone.

Steve: It's so contextual. I mean there are certain sleeper things, for example, that I run into when I deal with clients like, for example, if you're male and you're 40 years of age, if you're older, get your iron assessment, your ferritin and your [inaudible 00:48:54] BC, your transferrin, free iron measured. Look at that whole issue of iron toxicity.

Dave: Should you donate blood as a general rule?

Steve: That's how I handle it. I donate blood three times a year like clockwork. A lot of people don't and they're too busy or they don't like getting stuck with needles, whatever the reason. This is one of those things that can sneak up and kill you in two weeks when you're not expecting it.

You go from being healthy to being sick as a dog in two weeks. That would be something that I would put on my list that I would talk about. It's in my medical directive, in terms of how to respond to issues of anemia and iron supplementation.

The other thing would be in terms of supplementation, take an ordinary high-potency multivitamin and mineral. This was a lifestyle thing. It's a minimum insurance across the entire spectrum of nutritional needs. The other thing would be about the psychological side, the spiritual side of living to old age is cultivate happiness, cultivate joy, cultivate appreciation in your life.

Dave: That is definitely one we've heard before. Speaking of living to an old age, and for people who are watching us on YouTube or iTunes ... That's when you combine the two together. That doesn't happen for 10 more years. People who are watching the video here, like ... You're looking very healthy. No one would guess you're a 107.

Steve: Almost twice off.

Dave: You're one of the pioneers in the anti-aging field and you have applied these things to yourself. It shows in your cognitive fitness. The way you handle yourself mentally is very impressive. This is a guy who has walked the walk a lot longer than I have and has had phenomenal results. Thanks for all the work you do. Thanks for being on the show and you're welcome back here.

Steve: Okay.

Dave: One of my favorite sources of protein is upgraded collagen protein. This is a pre-digested form of collagen that comes from grass-fed cows. Collagen is a connective protein. In fact, it's one of the most common proteins in your body. It forms the matrix that your bones grow on. It forms the connective tissue for your skin and your hair and your nails. It's one of those things you don't really get to eat if you eat a modern diet.

We tend to eat the muscles of an animal and we leave behind all the cartilage and all the skin and all the other parts that are less attractive to eat. It turns out that collagen has all of that goodness in it so you can keep regenerating your own tissues that are based on collagen. It has a very mild flavor. In fact, I put it in my bullet proof coffee and it doesn't change the flavor in a noticeable way, but it gives a really nice head of foam on it.

This is a great way to add protein to your day. For people who are looking at resetting their leptin levels, one of the tricks to do that is have 30 grams



of protein in the morning. The way to modify your bullet proof coffee is to make it the way you would, ideally with Brain Octane oil, and then add about four tablespoons of the upgraded collagen protein to it. When you do that, you'll end up feeling a huge difference.

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