EP_1243_SANDRA_KAUFMAN_MD_AUDIO

Dave: [00:00:00] Dr. Sandra Coffman, one of the smartest longevity docs. Why on earth would you drink Diet [00:00:05] Coke? Because it's delicious and it's refreshing. I feel so dirty. I'm sitting in a room with someone who [00:00:10] doesn't drink coffee.

Sandra: No, I don't.

Dave: Would you take stem cells? I don't

Sandra: like the idea of someone [00:00:15] else's DNA being in my body.

I'd take birth control.

Dave: Take birth control? Have you not seen the studies [00:00:20] about what that does? for your risk of cancer and all these other things.

Sandra: But you have to understand why it [00:00:25] causes cancer.

Dave: Oh my God. You're like the worst longevity doctor ever. What is the [00:00:30] number one medication that can be used for longevity that no one's ever heard of?[00:00:35]

You're listening to The Human Upgrade with Dave Asprey.[00:00:40]

This episode is recorded live in the studios here in Austin. [00:00:45] And a good friend has flown in specifically [00:00:50] for this episode. We're both heading to the American Academy of Anti Aging [00:00:55] Medicine tomorrow. This is a very weird longevity doctor. [00:01:00] I'm just going to have to say that and that is one of the highest compliments that I could pay someone.[00:01:05]

Dr. Sandra Kaufman or Sandy as she's known by her friends and colleagues is a former [00:01:10] chief of pediatric anesthesia and a longevity expert and an author [00:01:15] and one of the smartest longevity docs I've ever had the pleasure of becoming friends [00:01:20] with. We've hung out multiple times And this crazy [00:01:25] person, I'm just gonna have to say this, will order the

Diet Coke, [00:01:30] the Fritos, the cupcakes, and all of the crap [00:01:35] that would knock me on my face if I ate it.

And she's healthy. [00:01:40] Lean, her brain works perfectly well, and [00:01:45] when I first met her, I thought, this is the worst longevity doctor I know because she doesn't [00:01:50] know how to fucking eat. I just have to say that f bomb and all, but [00:01:55] I'm like, why would you do that? And she looks at me and she goes, because I like it and I'm an [00:02:00] anesthesiologist and I know all the pathways, so I'm just going to block them all so I can do whatever [00:02:05] the heck I want.

And I'm like, this is a fascinating person. [00:02:10] And as I got to know her work and just the structured thinking of longevity, [00:02:15] I have never had a conversation with Sandy where I didn't walk away [00:02:20] reconsidering something, thinking about something. This is going to trigger you, [00:02:25] or at least has a good chance of triggering you unless you've done all untriggerable.

If [00:02:30] not, wait for my next book. She's going to talk about how to do things [00:02:35] that you and I both know are not healthy and get away with it. And what is [00:02:40] the definition of biohacking? Change the environment around you and inside of you so you have full [00:02:45] control of your own biology. If you want the ability to occasionally, or maybe [00:02:50] even every day, eat junk food and either not pay the price or [00:02:55] maybe pay a much smaller price, which is what I still think she's doing.

She's going to disagree with [00:03:00] me. Then she's going to teach you something. Or if something's not working, you're going to learn about [00:03:05] Some of the seven pillars of aging. I'm in her book. How many pillars do you have seven [00:03:10] tenants seven tenants a guy had seven pillars Some people say there's nine And [00:03:15] so it'll be a similar conversation to things you've heard before if you've taken my longevity course and things like that [00:03:20] But she's gonna tell you here's the natural stuff Here's the pharmaceutical stuff that blocked each of [00:03:25] these pathways and the lifestyle stuff.

So she's more pharmaceutically oriented than I am [00:03:30] but if you're one of those One of those people who says, I'm never [00:03:35] using a pharmaceutical because they're bad. That's like saying, I'm never using a gun because they're [00:03:40] bad. Even if you wanted to eat an animal that was hunted with a gun, right? [00:03:45] So what Sandy knows is the pathways of aging.

And she's like an [00:03:50] encyclopedia. And all of the tools, pharmaceutical or not, with no bias [00:03:55] whatsoever, they give you full control of those pathways. This is a radical look. It [00:04:00] is fascinating. And she has no opposition to natural supplements. She's like, give me the right tool for [00:04:05] the job. I have no bias. And that is one of the things I respect the most.

So Sandy, I'm [00:04:10] so happy you came to Austin for the show.

Sandra: I am delighted to be here. I have to say that was the best [00:04:15] introduction ever. I love being called weird by you because such the compliment.

Dave: It [00:04:20] also takes one to know more.

Sandra: When we first met, we had the best conversation ever. We looked [00:04:25] at each other.

We had a fantastic discussion slash argument. Many [00:04:30] people gathered around just listening to our repartee. You even joined me on stage where it [00:04:35] continued and, uh, We've always just had the best conversation.

Dave: We have, and you're just [00:04:40] endlessly curious, and you, you have this mindset of [00:04:45] taking control in a way that's, it's very unique, especially for a [00:04:50] physician.

And I think, for people who aren't in the field of medicine, and to be clear guys, I'm not, I just [00:04:55] like to pretend like I am on the internet, I guess. You know, I, I'm not a doctor, I'm very clear about that, and I have great [00:05:00] respect for the training. The doctors who really have deep knowledge are [00:05:05] anesthesiologists.

And pediatric MCG, I'll just, that's the toughest thing because kids [00:05:10] metabolisms are different. So you're at the very top of your game at that, and I think that's led you to be so [00:05:15] relentless. Do you think that's right?

Sandra: No, I think that's absolutely right. In the adult world, we have [00:05:20] lots of medications, and it's a one size fits nobody, as we say.

In pediatrics, everything [00:05:25] is absolutely titratable to the child's size their [00:05:30] BMI, to what they have. So I've taken that. information with

pharmaceuticals as well [00:05:35] as natural stuff and sort of taken it and directed it toward the world of [00:05:40] longevity.

Dave: When we first hung out, I was kind enough to share one [00:05:45] milligram nicotine dose with you, nicotine is a longevity drug in my book.

You [00:05:50] didn't like it very much. What happened biologically?

Sandra: Biologically? That's an [00:05:55] excellent question. So medically I became tachycardic, [00:06:00] diaphoretic, and I vomited my guts out. It was delightful.

Dave: [00:06:05] I did, was so appreciative. I did hold your hair up for you. I felt bad.

Sandra: You, you did. I was vomiting in a [00:06:10] garbage can.

And he very, uh, very kindly. Yes.

Dave: I felt bad.

Sandra: Yes. [00:06:15] Got me a garbage can, held my hair back, walked me to my room, and then he proceeded to do it again a [00:06:20] year later.

Dave: You have to try it twice to know if it works.

Sandra: Yeah, we're, it's, it's a terrible drug. [00:06:25]

Dave: So, I have been with probably 5, 000 [00:06:30] people who tried pharmaceutical nicotine for the first time as a nootropic and [00:06:35] a longevity molecule for the drug.

You had the most severe reaction of anyone I've ever [00:06:40] seen. Is that because you're on all these other drugs and cupcakes?

Sandra: I love how you got the cupcake thing in there. No, [00:06:45] I have no idea. I don't take a lot of nicotine. I never have. I think I'm just not [00:06:50] accustomed to it. So my receptors, I've just never seen them.

I mean, God knows my [00:06:55] liver's seen enough drugs, but just not that one. How's your liver? It is fantastic. [00:07:00]

Dave: How do you measure your liver?

Sandra: Well there's the standard liver enzymes. Mm-hmm . Uh, which of which they're absolutely [00:07:05] fine, but I upregulate the mitochondria of my liver every day, so I can only assume that it's topnotch.

Dave: Do [00:07:10] you ever do like a liver screen for fibrosis?

Sandra: Uh, I've [00:07:15] had full body MRIs and cts and you can generally see it. Cancer is, I have nothing.

Dave: [00:07:20] Got it. I just did an episode on liver health and they use, basically an AI [00:07:25] powered thumping test that looks for fibrosis, and they said I had a 10 year old's liver, the [00:07:30] healthiest results they'd ever seen.

So, I would say biohacking works on [00:07:35] that. Of course it does. Okay. What is the worst pharmaceutical that [00:07:40] people take that makes them old without knowing it?

Sandra: Oh my god, that's an excellent question. There are so many [00:07:45] of them.

Dave: Right.

Sandra: I wouldn't even know where to start. The problem is people take [00:07:50] medications to cure one problem when they're clearly precipitating others.[00:07:55]

I don't want to say anything as a physician, they're going to say, Oh my God, I shouldn't take [00:08:00] X despite what my physician told me because I could die of something else. Obviously the [00:08:05] chemotherapies are terrible. On the other hand, it's better than dying of cancer.

Dave: Yeah. There are [00:08:10] times when for a certain kind of tumor, this kind of chemo is very well proven to [00:08:15] work and I don't have any issue with that.

I wouldn't want to do chemo first line unless I knew what kind of cancer I had and that it would respond. [00:08:20] And you can test for that. Right?

Sandra: No, absolutely. But there are, there are a lot of things that are just absolutely. Yeah. Absolutely. [00:08:25]

Dave: So I'm thinking, look, look for more common things.

Sandra: Look for more common things.

Dave: [00:08:30] Things that 25 million plus people take daily.

Sandra: If you're trying to come up with something specific, I don't [00:08:35]

Dave: know what you're aiming for. No, I'm just thinking, well, I mean, there's, there's statins, there's [00:08:40] Tylenol, there's ibuprofen, there's cold medicine there's very commonly prescribed [00:08:45] things that are not good for longevity.

Sandra: So a lot of it is derisory related. For example, [00:08:50] Tylenol. It's [00:08:55] not an anti inflammatory per se, but it does do a lot of things in the central nervous system that are actually good in [00:09:00] very low dose.

Dave: How low is a low dose?

Sandra: Like five per kilo. I speak in pediatric [00:09:05] terms, right? So five per kilo. But a standard adult dose, which is about a thousand milligrams, will over time, yeah, [00:09:10] be very bad for your liver.

Dave: Yeah, and probably some other things like your kidneys also take a big hit.

Sandra: [00:09:15] Well, everything gets metabolized differently, right?

Dave: Okay.

Sandra: Thyminol gets metabolized differently. In the liver [00:09:20] specifically? Not really in the kidney.

Dave: I thought it also had some metabolite that also, like post [00:09:25] liver, I could be wrong about it.

So,

Sandra: metabolites in the liver and then those metabolites obviously have to get [00:09:30] excreted. So if you have a bit of a kidney problem, then the excretion is gonna go down, it's gonna sit in your body a [00:09:35] little longer, and then it can be problematic. Like everything is, is stages to sort of metabolize and get rid of it.

[00:09:40] But you mentioned statins, and again, statins have a place.

Dave: They totally do.

Sandra: If you [00:09:45] are, you know, suffering from extreme dyslipidemia, they're very useful. On the [00:09:50] other hand, absolutely, longevity, it's not really their strong suit. They do actually help with stem [00:09:55] cells, so it does have a plus. On the other hand, they're extremely harmful in other ways.

But there are many ways [00:10:00] to skin a cat and there are other pharmaceuticals that get rid of cholesterol rather [00:10:05] than decreasing the production of it. So there's many ways to get around statins.

Dave: Is [00:10:10] cholesterol bad for you?

Sandra: Too much is bad for you. Too little is bad for you. You [00:10:15] need the right amount.

Dave: Why is too much bad for you?

Sandra: Too much is bad for you because it [00:10:20] clogs things. It tends to be very, it gets oxidized it just sits [00:10:25] places where it shouldn't sit. It accumulates. On the other hand, not enough means you don't have the [00:10:30] building blocks to make standard things in life. So you need the middle [00:10:35] amount.

Dave: Since plaque and arteries isn't cholesterol, where does it accumulate?

Sandra: Accumulates in your [00:10:40] cells.

Dave: Inside your cells. Inside your

Sandra: cells. Absolutely.

Dave: So this is intracellular junk [00:10:45] basically. Got it. Okay. And what levels of total cholesterol do you get worried from a longevity [00:10:50] perspective?

Sandra: It depends on the person.

Absolutely. And I, so funny, I look at international [00:10:55] levels all the time and they're so different from country to country. So I don't like to cite [00:11:00] numbers. I like medium to low.

Dave: Medium to low. Okay. And [00:11:05] my perspective is I don't really care unless it's above 300 ish or something. As [00:11:10] long as your LP, CRP are low, there's no [00:11:15] evidence of clogging of the arteries in your cholesterols.

is 275 [00:11:20] HDL is high triglycerides are low. Who cares?

Sandra: Because it's a mal, so atherosclerosis is [00:11:25] multifactorial. It's high lipids. It's oxidative stress. It's big and it's [00:11:30] inflammation, right? So if you only have one of those components. It's not so terrible. If you have [00:11:35] two, it's not so great. If you have three, you're going to die.

Right. So it unto itself is [00:11:40] not terrible unless you pair it with other things. And I will tell you that anyone over 40 is high [00:11:45] levels of oxidative stress unless, unless they're us.

Dave: Yep. Unless you're doing something about it. [00:11:50] Okay. Why on earth would you drink Diet Coke? Because it's delicious [00:11:55] and it's refreshing.

And it's addictive as all hell?

Sandra: It's totally addictive. [00:12:00] So I will tell you a story. And this is absolutely ridiculous. Ridiculous. My [00:12:05] father, when I was in high school, drank like 13 to 14 cups of coffee a day. And he happened to get [00:12:10] renal cell carcinoma. And he decided, despite all medical information, [00:12:15] because he's an endocrinologist, but despite that, he decided that he'd gotten cancer from coffee.

Which we all [00:12:20] know now is Absolutely absurd. I'm talking to the coffee king. However, he said, if you [00:12:25] don't ever drink a cup of coffee

or if you get through med school without coffee, I will buy you the car of your choice.

Dave: [00:12:30] Wow.

Sandra: So I didn't. I've never had a cup of coffee. The irony is that I never got a car [00:12:35] either.

Dave: I feel so dirty. I'm sitting in a room with someone who doesn't drink coffee. Drink coffee.

Sandra: No, I don't. [00:12:40]

Dave: You're a longevity doctor. I'm so, I'm so sad. I

Sandra: know. I take a lot. I eat a lot of chlorogenic acid. Does that, [00:12:45] does that help?

Dave: You could just take it straight from the source.

Sandra: I do, it's called a bottle, it says [00:12:50] chlorogenic acid.

But I had to drink something that kept me up, so [00:12:55] that's what I did. It's okay, I take osteoblastic activators, my enzymes are fine, [00:13:00] my bones are fine.

Dave: I'm not worried about the phosphoric acid. Everything

Sandra: is [00:13:05] fine.

Dave: I totally believe you because you measure the stuff, you're hardcore about this. [00:13:10] What do you do to protect your brain from excitatory [00:13:15] neurotoxicity from the artificial sweeteners?

Sandra: So I optimize my brain like I would optimize [00:13:20] anyone's brain, to be perfectly honest. I worry about free radical scavenging, I worry about [00:13:25] glycation stress, I worry about you know, hippocampal plasticity, [00:13:30] all of the standard brain concerns, and I take many things that get through my blood brain barrier [00:13:35] to address those issues.

Dave: Um, none of those, though, have to do with [00:13:40] excess levels of aspartate, though, right? Eh,

Sandra: not really. On the other [00:13:45] hand, if your metabolism is good and your mitochondria are good, you're going to process any true [00:13:50] toxin and you're going to get rid of it.

Dave: And you don't worry about it turning into formaldehyde in the bottle when you drink it?[00:13:55]

Why not?

Sandra: You're ruining my bad habit. I, you know, I've [00:14:00] looked at all of these things clearly. Life is a risk benefit ratio. I've decided to take the risk.

Dave: [00:14:05] Okay. In other words, you choose danger.

Sandra: I do

Dave: see [00:14:10] guys, everything you do has a risk and you can say it was worth it [00:14:15] for me and this is one of the things I just absolutely love [00:14:20] about Sandy's way of thinking it's like I wanted to do it.

My body can handle it and you could say, [00:14:25] well, that's not wise, except it's. She knows what she's doing. She's an [00:14:30] adult and I totally support her right to drink diet [00:14:35] coke for me I'm going to save the hits my biology is gonna take for things that I like [00:14:40] more than diet coke But if diet coke brought me extreme joy, I would do the same thing [00:14:45] except for me I turned to an idiot when I drink it, so I probably shouldn't

Sandra: well, I'm sorry.

You can't control your [00:14:50] diet coke I'm so sorry, but what's really interesting about it, and I [00:14:55] actually go out of my way to tell people that I do drink Diet Coke and eat cupcakes. Because a [00:15:00] lot of longevity folks are out there portraying themselves as absolutely perfect. And [00:15:05] I think for the, for general population, that is scary.

It's intimidating and they get [00:15:10] turned off. They're like, I can't do that. So when clients come to me, I want them to be [00:15:15] themselves and I want to optimize themselves. I have a lovely woman. She's from Russia. [00:15:20] She loves to vape. As many times as I told her that it's bad for her,

she's not given it [00:15:25] up. So we have designed a program to minimize her vaping.[00:15:30]

I have other women, they will not give up their wine. So we [00:15:35] just design programs, you know, for for everyone's downfall, because the idea of [00:15:40] longevity is you don't have to be perfect, except what you can do, except what you can't do. [00:15:45] And that's what what it is.

Dave: My idea of hell would be spending eight [00:15:50] hours a day on longevity, because I have to live 50 percent longer just to [00:15:55] be just to break even, right?

Because I didn't get to go do fun [00:16:00] stuff during all that time and I also would like to [00:16:05] sometimes have some alcohol. I drink like twice a year. I'm just about a non drinker, but if it's [00:16:10] really good sake with my sushi, I'm going to do it. And I know how to block all this stuff in it. I've done multiple [00:16:15] episodes about it.

Do you drink?

Sandra: Yeah, I drink a little.

Dave: Yeah.

Sandra: It's the same sort of thing. [00:16:20] If it's good alcohol, you're in good company, have some. Because [00:16:25] you, because you don't, you can't be miserable in life. It's about living.

Dave: I know some people are pretty good at being [00:16:30] miserable. Oh, we know lots of people. There's this one guy who says you can't extend human [00:16:35] life at all, but if you just exercise for two hours a day, maybe you'll be healthy when you die at a normal [00:16:40] age.

And he says he's into longevity. I'm like, that's so weird. Like that's my idea of hell.

Sandra: Everyone has their [00:16:45] perspective. Yeah. That doesn't sound like fun either. I mean, granted, I love exercise, but I don't [00:16:50] have time for two hours a day.

Dave: Right. And mostly when you exercise, you're bouldering, right? Like you're going out and [00:16:55] climbing rocks.

I do climb a lot of

Sandra: rocks. Yes.

Dave: Do you ever climb a building? [00:17:00]

Sandra: I have climbed a building.

Dave: That's cool.

Sandra: Yes. It's really fun.

Dave: Yeah. You're built for that. I'm, [00:17:05] I'm way too heavy. My, my bone density there.

Sandra: Yeah. You're just. Horribly obese would [00:17:10] be embarrassing, actually, yes.

Dave: Plus, you ever try putting a size 16 foot into a crevice?

Sandra: [00:17:15] Clearly not.

Dave: No. It's like, that's not a crevice. That's like, it doesn't fit. So, [00:17:20] the world's made for small people, I tell you. Alright. Where do you want to go next? [00:17:25] So many fun things to ask and so many educational things. What are the [00:17:30] seven, wait, what do you call them? You don't call them pillars? I call them tenets.

Okay, there we go. In your work around longevity, what are the [00:17:35] seven tenets of aging?

Sandra: Okay, so the seven tenets, so you have to understand that when I [00:17:40] did this. Um, the hallmarks were some weird paper that no one had ever [00:17:45] read and no one had ever heard of. I glanced at them and I said, well, that's an interesting list, but it's kind [00:17:50] of crappy.

So I thought I'm just going to make one that's better. And it does come from the perspective that I was a cell [00:17:55] biologist before I went to med school. So I didn't sort of make all of this up, right? I mean, it comes [00:18:00] from legit.

Dave: Yeah.

Sandra: Study.

Dave: You also have a degree in plant physiology or something like that.

I do.

Sandra: It's cell [00:18:05] biology and plant physiology. I do. Which is amazing at cocktail parties when people ask you [00:18:10] like, you know, anyway, whatever. What are the tenants? That's a good question. So I organized it [00:18:15] by sort of big headings with subheadings. And I think it's better than the hallmarks [00:18:20] only in that you can put in subheadings.

So you sort of maintain the same structure as an [00:18:25] example. So tenant one is DNA alterations. In this category, we've got telomere issues, [00:18:30] we've got epigenetic issues, and the new thing that I've sort of jumped into is heterochromatin [00:18:35] versus euchromatin distribution, right? And if I just said, oh, randomly, oh, this is really [00:18:40] interesting, where do I put it?

It would just be like the 77th hallmark, but no, I have a home for it because it goes [00:18:45] into DNA alterations, right? Two is issues with your mitochondria. [00:18:50] Mitochondria fail for six or seven reasons, depending on how you count them, right? Has to do [00:18:55] with mitochondrial permeability pores, has to do with NAD deficiency, failure of your [00:19:00] mitochondrial or the electron transport chain.

You know, the list goes on and on. Endogenous free radical [00:19:05] scavenging, et cetera. So that's two. Three is what I call pathways. And there are probably hundreds of [00:19:10] different longevity pathways, but I like to consider the top three and then I added a fourth. So these [00:19:15] are your sirtuins, this is your AMP kinase pathway, your mTOR pathway, and I've recently [00:19:20] put the circadian pathway in there because it's just absolutely crucial to longevity.

That's [00:19:25] three, then four is what I call quality control. And this has to do with the idea that if your cell is like a little [00:19:30] factory, you're making some widgets, and you have to check your widgets, because things don't always go as [00:19:35] planned. So this is DNA repair mechanisms, of which there are five and this is proteostasis [00:19:40] systems, and all the heat shock proteins and that sort of thing fall into that category as well as recycling when your [00:19:45] widgets just aren't working out.

So that's autophagy as well. Five is your [00:19:50] immune system that turns into your inflammatory system over time. Quite important. Six is what I [00:19:55] call individual cell needs. So this is where you want to take care of your stem cells, maybe [00:20:00] eradicate your senescent cells and understand that a bone cell is different than a neuron, which is different than a red cell.

And [00:20:05] then the last category is waste management because obviously when you have a little factory, there's just [00:20:10] stuff that causes problems. So this is going to be glycation issues mostly and then lipofusion [00:20:15] accumulation. So in a nutshell, that's pretty much why you age.

Dave: Got it. [00:20:20] One thing that's really cool is you've bucketed these things.

[00:20:25] The seven pillars that I had have some similarities and I did my best [00:20:30] on those. You have some pathways in your work that I didn't get into. We both have a really [00:20:35] strong interest in circadian issues. You know, True Dark is one of the first [00:20:40] modern circadian glasses companies. In fact, I think it's the first modern one.

And, [00:20:45] I've been researching that for 10 plus years and it's been a major part of my longevity thing is to learn how to go to [00:20:50] sleep at 10 30 instead of 2 a. m. which was my default for the first 40 years of my life. Just I [00:20:55] would always go to sleep at two and now I've been able to reset that and you [00:21:00] do see benefits from it.

What are the circadian pathways [00:21:05] of aging?

Sandra: So interestingly enough, I love this one of my favorite topics. So [00:21:10] you go to sleep and wake up because you make two proteins. They go to sleep, two proteins wake you up. [00:21:15] So you go to sleep with BMO1 and CLOCK. They're made in the [00:21:20] nucleus, they go to the cytoplasm, they heterodimerize, and then they go back in.

That [00:21:25] triggers cryptochrome and period, right? Those are the ones that They, [00:21:30] again, go to the cytoplasm, they heterodimerize, they go back in, and they turn off the other. So it's on, off, on, [00:21:35] off. That is a vacillatory pattern, which is then affected by two things, [00:21:40] reverb alpha and ROR alpha. And it turns out that all of these things [00:21:45] become sort of clunk with aging or with disease.

And you can [00:21:50] actually make all of those things go back to sort of homeopathic levels, which is [00:21:55] fantastic. And a lot of people know how to do some of it, but not all of it. And the one that most people don't look at is the ROR [00:22:00] alpha, which increases the vacillatory amplitude. And you can do that with something called [00:22:05] nobilitin.

And I love that one because, no, it comes from orange peel.

Dave: Okay. So [00:22:10] is it, it's. I don't think you can buy nobilitin directly. What is it? How do you [00:22:15] spell it?

Sandra: N O B I E L I T E N. Interesting. I

Dave: do use an orange [00:22:20] peel extract, but it's not that one. I'm trying to remember. Well, it's in orange

Sandra: peel extract, so it might [00:22:25] actually be a component of it, but you can, you can separately buy nobilitin.

Dave: And you take this at what time for sleep?

Sandra: [00:22:30] Actually I'm working on that because ROR alpha pathway, but no one's actually [00:22:35] tried to figure out like. When the best time to upregulate that is so I'm a bit of an experiment right now. [00:22:40] I've been taking it in the morning We'll see what happens, but I ain't gonna tell you I'm sleeping like a rock.

Dave: What [00:22:45] happens when your ROR alpha pathway increases?

Sandra: What it increases, the amplitude is [00:22:50] stronger. So you know how you, everyone is always like staring at their aura ring, like how many minutes [00:22:55] of rem in this and that and the other. But the, the degree of depth, the depth of sleep [00:23:00] is, is better when you activate ROR alpha, because it [00:23:05] increases the amplitude versus REBORB alpha.

decreases the amplitude. So like the pathway [00:23:10] is just get significantly better.

Dave: And you're doing that in the morning. It's [00:23:15] really frustrating to hack your sleep because naturally you want to take everything before you go to bed

Sandra: [00:23:20] but it doesn't work that way. No, not at all. And the other interesting component to this is this also [00:23:25] driven by sirtuins and NAD, right?

So, NAD [00:23:30] sort of drives, is, is actually, so NAD I love, because it is made in circadian fashion [00:23:35] and by default it controls circadian rhythms.

Dave: It controls or it's in? No,

Sandra: it [00:23:40] does, because NAD controls sirtuins and sirtuin 1 and 6 control when the other things are made. [00:23:45] Right? So it's, it's all very [00:23:50] interconnected.

So as you age, your NAD drops, your sirtuins drop. Clock beam all drop [00:23:55] cryptochrome drops or alpha drops, right? So this is why people can't sleep and I love [00:24:00] going to sleep lectures when people say Oh Turn off the lights do this meditate. But [00:24:05] if you don't have the biochemical processes in place, I don't care what you do You're not [00:24:10] going to sleep

Dave: You'll still get better sleep because of the SCN activation if you dim [00:24:15] the lights, but there's a lot more you can do you can

Sandra: Yeah.

I mean, it's just not going to get to the heart of the [00:24:20] matter. The heart of the matter, it's biochemical processes.

Dave: If I remember right, dimming lights does [00:24:25] affect BMAL, but not the other stuff you just talked about. That is correct. Okay. So, the good [00:24:30] thing is it's free to turn off the lights and you might spend a little bit of money on supplements or something.[00:24:35]

Is there a sleep [00:24:40] pharmaceutical that you think is safe and effective?

Sandra: Not one to take in isolation.

Dave: What about [00:24:45] GHB? I've

Sandra: never tried

Dave: it. There's a prescription form of GHB.

Sandra: I've [00:24:50] never tried it.

Dave: Oh my god, you, you should because it radically increases growth hormone. [00:24:55] And since you're a doctor, you have a permission slip to buy whatever you want.

Oh,

Sandra: I can buy whatever I want regardless. It's not

Dave: [00:25:00] fair.

Sandra: Mwahaha.

Dave: I want to buy whatever I want.

Sandra: No, I've just, I've never had trouble [00:25:05] sleeping since I optimized my circadian rhythms. So I've never had the need, so I've never done [00:25:10] it.

Dave: Makes good sense. Ambien. Good for you, bad for you. Oh,

Sandra: it's terrible for you.[00:25:15]

Dave: Got it. Okay. I think so too.

Sandra: Yeah.

Dave: I thought you were going to say, well, I take it and then I take seven other [00:25:20] pharmaceuticals and I have Ambien parties or something. Oh gosh,

Sandra: no. No, no, no. No. [00:25:25] No. Taking a benzo or a benzo like medication to sleep is [00:25:30] the worst idea ever.

Dave: Yeah, oh, it's going to do bad things.

Why [00:25:35] is NAD bad for you?

Sandra: Ha ha, that's a very So Too much NAD is [00:25:40] bad for you. Let's rephrase the question.

Dave: Oh, take away all the fun. Okay. I

Sandra: know, I know. [00:25:45] So, so NAD is bad for you if you have too much in a short period of time [00:25:50] because it has a very short half life, somewhere between three to 15 hours because it's [00:25:55] circadian and it breaks down into NAM, which has a negative [00:26:00] effect on your PARPs and your sirtuins so it becomes metabolically sort of [00:26:05] toxic.

So you don't want a lot of NAD at one time. So I'm staunchly [00:26:10] opposed to the IV therapies.

Dave: When I did 20 rounds of IV [00:26:15] NAD, it did improve my sleep. It improved my alcohol tolerance [00:26:20] dramatically. And this was 10 plus years ago. And I've been taking [00:26:25] nicotinamide riboside, or NR, since the first mouse study came out about 15 years [00:26:30] ago.

I bought NMN when you could only get it from China. I started taking that. And [00:26:35] I I've noticed that I do get inflammation over time from [00:26:40] NAD by itself, and I've had a couple episodes about why. Walk me through [00:26:45] the reasons you might take NR, NMN, or straight NAD. [00:26:50] When, how much, like, give me the master, the master class on NAD.

Sandra: Perfect. Okay, [00:26:55] so as we all know, and you know, and I'm sure you're listeners know as well. We need NAD for many things [00:27:00] around the body. In the redox reactions, we have NAD, but we don't [00:27:05] actually break it down. We just sort of shuttle some protons around. So that's a break even sort of phenomenon, right?

But [00:27:10] we need neuromitochondria for the Krebs cycle, the electron transport chain, and glycolysis. For [00:27:15] other reactions, and we need NAD for about 500 enzymatic reactions in your body, [00:27:20] the molecule gets chopped into pieces. And where it gets chopped depends on the [00:27:25] process. The big two are sirtuins. And the [00:27:30] PARPs.

So two ones are necessary because it controls most all cellular homeostasis. [00:27:35] PARPs, you've got 17 PARPs, but PARP 1 is the most important for DNA repair [00:27:40] mechanisms. Therefore, without enough NAD, you're going to get cancer and you're going to lose [00:27:45] cellular homeostasis.

And most people, statistically, by the time you are 40, you are [00:27:50] deficient.

Okay, now what to take? Very good question. There is an [00:27:55] internal cycling system called the salvage pathway, and then of course there's the de novo [00:28:00] pathway. The de novo pathway, it starts from tryptophan 10 enzymes later you get to NAD, [00:28:05] it's very expensive. Interestingly enough, however, kidneys prefer the [00:28:10] tryptophan pathway.

Dave: Okay.

Sandra: So if you're tryptophan deficient, you can, over many years, you can have [00:28:15] chronic kidney failure, and I can guarantee you that no nephrologist is going to identify that as an [00:28:20] issue. Wow. Because it's just sort of bizarrely esoteric. Yeah. Once you have NAD and it [00:28:25] gets broken down, the standard thing is that you get NAM, NAM then goes to NMN, which then [00:28:30] gets regenerated to NAD, right?

It's sort of like this little triangle pathway. [00:28:35] NR gets fed into NMN and then turns into NAD. So the [00:28:40] question is, so all of these different enzymes sit around interconverting everything, right? So [00:28:45] that, the key is then what tissues have the enzymes and what tissues have receptors for all of these [00:28:50] various components.

So, it turns out that, like, your retina [00:28:55] prefers NMF. Turns out that your muscle prefers NR. [00:29:00] And as I said, the kidney prefers tryptophan. Neurons, however, that's the [00:29:05] only cell in your body that has an NAD receptor on its surface. So if you take straight [00:29:10] NAD and take not orally necessarily because bioavailability, that [00:29:15] method is not so great.

But if you get NAD straight into your body, it does actually go through the blue brain [00:29:20] barrier, gets into neurons, and it's incredibly good for, for neurons. So [00:29:25] my argument is that you need a small dose of all of these things sort of [00:29:30] together.

Dave: Should you inject NAD into your muscle or [00:29:35] subcutaneously?

Sandra: Sub Q.

Dave: Okay. And no IVs, not necessary? I

Sandra: don't like the IVs. Too [00:29:40] much, too soon.

Dave: Got it. So, a hundred milligrams kind of a [00:29:45] dose?

Sandra: I do not talk about doses because sometimes you're talking about a 40 kilo [00:29:50] person and sometimes you're talking about a 200 kilo person. So as a pediatric anesthesiologist, we [00:29:55] avoid specific doses in publications or on air because someone will take me very [00:30:00] specifically and it won't be the right dose for them.

Dave: Can you talk about amount per kilo? [00:30:05]

Sandra: You're going to bite me into this. I will tell you that whatever it says on the bottle, take a [00:30:10] third of it.

Dave: The bottle of injectable?

Sandra: No, no, I'm sorry. No, but like if you look at the bottle of the NMN or [00:30:15] NR or whatever, like it always says like, like, like, I mean, the doses are ridiculous.

Dave: I could [00:30:20] never feel any effect from NR unless I was doing at least a gram a day.

Sandra: But you don't need to [00:30:25] feel the effect.

Dave: I like to.

Sandra: That's a different story. Heroin feels great too, but [00:30:30] you don't need to. It's a rush.

Dave: You're so unapologetic about Diet Coke. It's [00:30:35] hilarious. All right.

Sandra: One of these days Diet Coke, the Coke company is going to call me and go, [00:30:40] yes.

We want her. Hasn't happened yet. So the answer is it just depends. [00:30:45] If you are younger, you need less. If you are older and you're more deficient, then you [00:30:50] need more. If you are in a state where you have a chronic medical problem [00:30:55] like my agent has, has type 1 diabetes and she's

chronically inflamed, her body [00:31:00] eats through NAD like there's no tomorrow.

She needs higher doses.

Dave: Okay.

Sandra: Right? And when [00:31:05] she does, she can feel it. Right? I take the same dose. I don't feel a goddamn thing. So [00:31:10] everyone is different. Chronic medical conditions do different things. I think if you're [00:31:15] deficient, you have an effect, or if you're uber high, you feel an effect. I think a homeostatic [00:31:20] level, you really shouldn't feel.

Dave: When you take NAD or [00:31:25] NMN or NR over time. I mean, David Sinclair has shown these are beneficial [00:31:30] for reversing cell aging because of sirtuins and he's found the standard stuff. He's a friend. In [00:31:35] fact, I was I shared a stage with him at Oxford, him and George Church yesterday which [00:31:40] was really cool.

And, I actually did it over a panel. It was at the [00:31:45] second annual conference on human enhancement. Which is super cool. No, I was

Sandra: [00:31:50] just in Oxford for a conference. I couldn't fly over. An NAD conference, actually.

Dave: Oh, very cool. [00:31:55] So, uh, NAD has its place, but there's two other things it does. [00:32:00] It feeds NNMT and it feeds CD38.

[00:32:05] Can you talk about that really quickly?

Sandra: Oh, absolutely. So we're going to start with CD38 because that is crucially [00:32:10] important. So there are NAD ACEs. Uh, that are surface, generally [00:32:15] surface markers and they get, CD38 in particular, gets upregulated in a state of [00:32:20] inflammation eats through the NAD, and as a consequence triggers more inflammation.

[00:32:25] So if you can downregulate CD38, not only do you preserve your NAD levels, you [00:32:30] decrease inflammatory response, right? So there's something called [00:32:35] 78C that's made by Smith Gillex O'Klein that we can't get, even I can't get it. The natural [00:32:40] alternative is apigenin.

Dave: So if you take NAD, you should [00:32:45] take apigenin.

And this is a kind of well known longevity [00:32:50] supplement. I know quality has it in some of their formulas. I've been taking it every day for years. [00:32:55] It's probably a point to pulsing it. Maybe I don't take it every day, but I take it most days.

Sandra: Well, so, [00:33:00] so let's talk about pulsing.

Dave: Yep.

Sandra: I differentiate between supplements and adjuvants.[00:33:05]

Dave: Okay.

Sandra: A supplement in my world is something that you are supplementing that you already have in your body. [00:33:10] Right? So, magnesium, for example, it's a supplement, fine, carnosine, it's a [00:33:15] supplement. And when you have something in your body intrinsically, you have feedback loops to deal with [00:33:20] if you have too much or too little.

Adjuvants, things your body doesn't normally see, [00:33:25] does not have feedback loops.

Dave: Okay.

Sandra: So, apigenin, you have no [00:33:30] feedback loops for it. You're not going to upregulate some specific enzyme or receptor. It's just [00:33:35] not going to happen. So you don't have to pulse adjuvants.

Dave: Okay. How would [00:33:40] someone know whether their supplement is an adjuvant?

Sandra: Look it up on Wikipedia, and if it's endogenous to your [00:33:45] body, then it's a supplement.

Dave: Got it. Okay. Apigenin, there's none in the human body.

Sandra: None. [00:33:50] Okay.

Dave: That makes it real easy. Why would you use Wikipedia, which is an entirely [00:33:55] useless?

Sandra: Because it knows really dumb facts, like the first sentence will be, this is found in your [00:34:00] body.

I think they can't screw up like that simple shit. They

Dave: can't screw that up. I do know there's a [00:34:05] lot of big pharma funding for it. And there's a very clear bias in Wikipedia. So I'm, I'm not a fan. [00:34:10]

Sandra: Clearly no true scientific data comes from Wikipedia, but like the very, so I'm [00:34:15] not really a huge proponent.

But the very first sentence usually says. It's, it's [00:34:20] endogenous or it's not.

Dave: Okay. You can also just go to any AI and say, is this substance [00:34:25] endogenous in the human body and get a clear answer.

Sandra: Right. The key is you can't ask AI if it's a supplement because by [00:34:30] standard definitions, anything you can buy in a bottle is a supplement.

Right.

Dave: We're going to go [00:34:35] out to dinner with a group of friends tonight. And this is a restaurant that has [00:34:40] wild caught grass fed. It's called Dai Dui here in Austin. And it's [00:34:45] sort of like the place you go if you want really good meat. [00:34:50] Let's say that I'm going to eat all of the carbs and whatever weird sugary [00:34:55] dessert, like a lot of it, and some ice cream and all the crap that I actually am probably not going to eat.[00:35:00]

But let's assume I'm going to have 200 grams of sugar with my dinner. What [00:35:05] is the stack with supplements and with pharmaceuticals that will allow [00:35:10] me to have that much sugar without harming my aging?

Sandra: Well, this is really simple because I'm going to take my little [00:35:15] pile of pills and I'll bring an extra one and I will slide it across the table to you [00:35:20] and then we'll be fine.

Dave: When I drop into a hypoglycemic coma and twitch on the floor? I'll bring

Sandra: some extra ion glucose, you'll [00:35:25] be fine. No, but what's really interesting is most [00:35:30] pharmaceuticals, even for hyperglycemia, don't, can't actually send you [00:35:35] into a hypoglycemic state.

Dave: I mean,

Sandra: there are a few that can, but

Dave: Pure [00:35:40] glitazone can't.

Sandra: No, it can't.

Dave: Dude, I've, I've had it happen. Oh, please. [00:35:45] Okay, I have a CGM on my arm, and if If I take it, especially my blood sugar is [00:35:50] really high because I just ate a whole bunch of carbs, I'll drop into like 60 and Well

Sandra: then you're very sensitive because [00:35:55] I've been taking P aglutazone for years and

Dave: You might have P that's more expensive than [00:36:00] mine.

Sandra: I have the best P ever. It's, it's impressive. Has a [00:36:05] very distinctive odor.

Dave: I, I think I have the most expensive P. I don't know if it's the best [00:36:10] P, but I, I don't think we're going to actually compare that because that's a little bit much of a TMI thing. But [00:36:15] I,

Sandra: Okay. So what pharmaceuticals are going to take?

Yeah.

Dave: We're getting distracted. So yeah. Like give me the [00:36:20] stack. Okay. I'm going to do something that I know is bad for me because it's going to be delicious.

Sandra: All right. So, so [00:36:25] first thing you want to do is you want to block breakdown of carbohydrates in your gut. Okay. Two [00:36:30] enzymes there of notes are alpha amylase and alpha glucosidase.

Uh, we can block those. The [00:36:35] easiest thing is a carbose, your favorite thing actually that doesn't is is [00:36:40] coffee. So chlorogenic acid is a blocker of both so that will actually help because [00:36:45] if you take too much, uh, carbose, you will have horrible gas problems and it may [00:36:50] ruin the evening. So maybe a little, I'm a big believer in a little of a lot and not a lot of a [00:36:55] little.

Dave: And you're probably going to get extra lipopolysaccharides too because if you have undigested carbs in the gut, [00:37:00] the bacteria is going to go nuts and it's going to make your gut biome unhappy. So I'm not a fan [00:37:05] of carb blockers just because something's going to eat the carbs if I don't metabolize. No,

Sandra: [00:37:10] no, a hundred percent, a hundred percent, which is why you want a little bit of a lot, right?

So, [00:37:15] so you can do that. So many

Dave: carbos maybe if I don't mind farting.

Sandra: All right. So what the other thing we're [00:37:20] going to do is we're going to take a flozon.

Dave: Aflozin.

Sandra: aflozin family. It's canagliflozin, [00:37:25] depagliflozin, empagliflozin. They're constantly coming up with new [00:37:30] aflozins. Okay. This is a sodium glucose reuptake inhibitor.

Dave: Okay. I [00:37:35] just got some in the mail today, so I'm going to

Sandra: love this. So, the way this works [00:37:40] is your, your kidneys are going to filter out the glucose, and normally it would get [00:37:45] reabsorbed into your vasculature, but because you were blocking the receptor, you are now going to [00:37:50] excrete all the glucose that your body didn't need.

Dave: So this is something that should be like in [00:37:55] birthday cake icing automatically.

Sandra: Oh, 100%. 100%.

Dave: Maybe they could put [00:38:00] it in brightly colored kids sugar bomb breakfast cereals.

Sandra: Ooh. [00:38:05]

Dave: Kellogg's? Better than red number three.

Sandra: There you go. [00:38:10] Let's see, what else can you take for your glutose? So obviously metformin, most people are already on that.

Helps a [00:38:15] little bit, not a ton.

Dave: I don't like metformin for aging because of what it does to mitochondria.

Sandra: Again, [00:38:20] a little bit is good.

Dave: Microdose metformin.

Sandra: I take 500 a day. I don't take the [00:38:25] 1, 000 or the 1, 500. Some people are up to 2, 000. I think that's bad. I think 500 a day is the [00:38:30] way to go. Clearly it does. Yeah, it doesn't help your mitochondria. B12 [00:38:35] deficiency too. Subunit 1, blah, blah, blah, blah. That being said, it does help with the hypoglycemia.

Uh, you mentioned [00:38:40] P aglitazone. That's crucial.

Dave: And you do 30 milligrams of that for your body [00:38:45] weight. See what I did there? I saved you.

Sandra: I know. Actually, that's not true. I do 15. But I just let you go with it.

Dave: [00:38:50] Okay. I was saying you were fat.

Sandra: I've got some love handles. It's okay. You do not. It's okay. Let's see. [00:38:55] And then I'll, uh, and then the other thing that I do, and this is really silly, is I take something called hydralazine. [00:39:00] So hydralazine is actually a medication for emergency high blood pressure. [00:39:05] So if you were to show up in the emergency room and your pressure was 210 over 100 they [00:39:10] may give you hydralazine.

It's a very fast acting medication. Blood pressure drops. [00:39:15] What I love about it is it's a very potent trans glycosylating agent, [00:39:20] meaning that if you have glucose that is recently stuck onto some other [00:39:25] protein, or lipid, or whatever it is, right, it will come along, it's more attractive to the glucose molecule, [00:39:30] so the glucose jumps onto the hydrazine molecule and, ooh, you excrete it right out.

Dave: [00:39:35] Now, this is really important because in in my longevity [00:39:40] book we talk about advanced glycation end products. And for listeners, when you [00:39:45] have high blood sugar, the sugar sticks to proteins semi permanently and it [00:39:50] disables them and it makes free radicals. So this is bad for you from an aging perspective.[00:39:55]

And there aren't a lot of things that'll break that bond, but hydralazine, which is a pretty potent drug, will do that. [00:40:00]

Sandra: Well, so, so what it is, is that there are Six steps, non enzymatic [00:40:05] steps to go from a glucose and a protein to an AGE. The first [00:40:10] half of those are reversible, the second half

Dave: Okay, so if you have built up AGEs from [00:40:15] high blood sugar for a long period of time, what happens to those?

I'll

Sandra: get to that in a second. So for the first period, [00:40:20] if you introduce a more attractive molecule, right, transglycosylation, that is [00:40:25] extremely useful.

Dave: It's like a decoy so the sugar will stick to it.

Sandra: Exactly. So there are a few amino acids [00:40:30] that can do it.

Dave: Like carnosine, or?

Sandra: Karnicine is actually a dipeptide, so that, that does it.

[00:40:35] The hydralazine does it. There's a variety of few things that do it. Aspirin also helps a little bit. [00:40:40] Once you have an AGE and it's floating around, it's extremely hard to get rid of. [00:40:45] However, Lactoferrin is our friend in this instance, because Lactoferrin, if you look [00:40:50] at it, And you

squint really hard the molecule is in the shape of a barbell, and it's [00:40:55] supposed to carry two irons on each side, right?

It's lactoferrin, ferrin for the iron. [00:41:00] However what it can do if it's not carrying iron is it creates a little hole for [00:41:05] AGEs. So if you take exogenous lactoferrin If you measure your Lactoferrin, your, [00:41:10] your intern is going to tell you that you're horribly inflamed and that you're in really bad health.

But if you do take it and don't tell [00:41:15] anyone and no one notices, what it will do is it'll soak up the AGEs and then you'll [00:41:20] excrete them.

Dave: Now, the most common way of getting Lactoferrin would probably be colostrum, right? [00:41:25]

Sandra: Yeah, you can do that or you can just buy Lactoferrin. Okay.

Dave: Yeah, you can do both. [00:41:30] And the guys from armor have been on the show and I do use that pretty frequently.

[00:41:35] So, that was going to show up poorly in labs though.

Sandra: Yeah, no, it will. It will make your love. So I actually [00:41:40] interviewed for NASA about a year ago. And I'd forgotten that I'm on all of these crazy things [00:41:45] and I'd had my labs tested and I looked at them and I thought, holy shit, if [00:41:50] anyone saw this, they'd think I was going to die.

Dave: And you were going to go to space or what?

Sandra: No, I was going to do one of those things where you [00:41:55] like in a capsule, like on the ground for three months to pretend like you're in space. And, as it turned [00:42:00] out, I think it would have driven me absolutely nuts.

Dave: I can't see you being happy in one of those places.

Well, I

Sandra: said, [00:42:05] great, I can sit still and I can do some research, and they're like, oh, you can't do anything independent. I'm like, great, I can

[00:42:10] exercise. They're like, oh, no, you have to do the prescribed whatever. I'm like, yeah, so I'm glad I didn't go. But the funny thing [00:42:15] is, I did realize that some of my labs were redundant.

ridiculous. My urine was full of glucose. [00:42:20] Obviously, I'm like, look like a dying diabetic

Dave: because you're paying. Those

Sandra: are way wacky because my hdl, [00:42:25] my ldls are like I have completely altered them to to make me happy. Which means

Dave: [00:42:30] high hdl, low ldls.

Sandra: But like, kind of ridiculously, it looks like pathologic.

What's

Dave: your [00:42:35] hdl?

Sandra: Actually, I don't remember anymore, but it's very high. It's above

Dave: 100? Wow, okay.

Sandra: Yeah, [00:42:40] of course.

Dave: And what did that?

Sandra: Huh?

Dave: What does that?

Sandra: A series of things.

Dave: Okay.

Sandra: I [00:42:45] mean, I take 12 pharmaceuticals a day. Like, and they're, and they all, like, You're

Dave: so ridiculous, but cool. [00:42:50] They

Sandra: all do, like, little bits.

It's like a puzzle, right? Like, and you, like, go, oh, I need something for over [00:42:55] here. And you find a pharmaceutical that does that, right? Anyway, so like lots of little bits [00:43:00] point being is I didn't get to NASA, so I came off for a week and they [00:43:05] went 99 percent back to normal and I still had a few that were wacky.

So I did what every normal [00:43:10] human being would be, would to do is, so I had my, my, my 18 year old like [00:43:15] change the labs on the computer. That seemed to be the right thing to do. But the point being is [00:43:20] just, yes, this will make all of your labs look incredibly wackadoodle.

Dave: By the way, a [00:43:25] really common vitamin called biotin will break most labs.

So [00:43:30] if you are doing something like the Axo. Health, which is my web testing company that's [00:43:35] part of Upgrade Labs, or any, especially the expensive, you know, 1, 000 immune stuff, [00:43:40] do not take biotin for a substantial period of time before that because your results will [00:43:45] be insane and they'll think that you're dying and it's just biotin [00:43:50] dependent.

This is a really important thing if you do lab work. You're going to spend good money on labs. [00:43:55] So go off the stuff you don't need beforehand. Okay.

Sandra: Yeah. Good advice.

Dave: All right. [00:44:00] So I would not do hydro hydralazine.

Sandra: Why not?

Dave: My blood [00:44:05] pressure. Oh, you've got low blood pressure. Yeah. Like it, like it's, it's healthy because I manage it, but if I don't drink [00:44:10] enough salt in my water, uh, or, you know, I, I don't take the herbs that keep [00:44:15] my blood pressure perfectly regulated, it would drop it.

And for a lot [00:44:20] of people now, especially if you had long COVID. You're dealing with toxic mold or anything else like that. [00:44:25] If your blood pressure is not average to high, that's probably not a good thing because

really low blood [00:44:30] pressure can be fatal when you fall over and hit your head. Right, like that sort of a thing [00:44:35] is an issue.

Sandra: No, that is absolutely true. And I will tell you several things. Number one, it took [00:44:40] me a long time to build up the ability to take the hydralazine that I take. [00:44:45] I bonded myself out many times. So again, I don't recommend people do that [00:44:50] without the help of a physician. But you do need to be careful with low blood pressure because it's not just enough to your brain [00:44:55] and you pass out, you're decreasing microcirculation.

And that can be equally [00:45:00] as harmful. And of course the cure is a phosphodiesterase inhibitor, and I'm [00:45:05] sure that you are on that.

Dave: I have done let's say, I don't know if I've done a full episode on it, but I've mentioned lots of [00:45:10] times that Cialis in low doses is a longevity drug. It's actually a very [00:45:15] important one.

So I take six milligrams of Cialis, which is I think 10 percent of the [00:45:20] recreational dose. So it's enough that it makes sure that the blood's going to get into my brain in [00:45:25] microcirculation. Are there any other drugs that help microcirculation?

Sandra: Well, they're all phosphorus deacetylase [00:45:30] inhibitors. They just come in different brands, different names, different half lives.

[00:45:35] What's your

Dave: favorite?

Sandra: What do I take? It's on the tip of my tongue. Oh,

Dave: [00:45:40] shit. You know, I have a, I have a pharmaceutical that increases memory IO, if you know that. That's, [00:45:45] that's,

Sandra: that's, that's great. You know which one

Dave: that is?

Sandra: Magnesium threonate?

Dave: Oh, oh, that's like, it's not a [00:45:50] pharmaceutical. That's a supplement.

Pharmaceutical.

Sandra: Which?

Dave: It's just not in the physician's desk reference. [00:45:55] It's aniracetam.

Sandra: Oh, okay. Yeah, yeah, yeah. I'll

Dave: actually give you some after this. I will, I will, I will take. It's [00:46:00] super, super cool. It has a relatively short half life, but I've taken it every day for 20 [00:46:05] years. And people are like, why can you do all this stuff?

Well, I might've done some neurofeedback, but I've been [00:46:10] on modafinil and I've been on aniracetam for two, for [00:46:15] 20 years now. Nice. What about modafinil? Is that a good drug or a bad drug?

Sandra: [00:46:20] Medium.

Dave: Okay. Why do you like it or not like it?

Sandra: I remember looking at it several years ago and the side [00:46:25] effect profile was, and I don't remember what the side effects were. It's

Dave: pretty small.

Sandra: But I distinctly [00:46:30] remember then that it wasn't for me.

Dave: Okay.

Sandra: And I also remember at the time that it was in conflict [00:46:35] with something else that I was taking. So I don't recall the specifics.

Apparently I need more of your [00:46:40] drug.

Dave: Enterostim's a funny drug. It's not illegal in the US. But it isn't [00:46:45] approved in the U. S. Which is funny because I do not remember hiring my government to approve what I [00:46:50] can and can't take. In fact, they're uniquely crappy at that. Look at what they allow in our food.

So like I [00:46:55] don't care what they say. Fortunately, you have the right to import NRS at time if you want to.

Sandra: Well, God knows I [00:47:00] import many medications. So I think that that will be fine.

Dave: What is [00:47:05] the number one medication that can be used for longevity [00:47:10] that no one's ever heard of?

Sandra: Cellbex.

Dave: What is Cellbex?

Sandra: Cellbex. [00:47:15] So, speaking of out of country, this has been approved by the FDA in Japan, [00:47:20] and it's been approved for, it's basically a heat shock protein [00:47:25] activator, and they use it for drug induced gastritis. And it turns out that it goes [00:47:30] to the cells in your stomach and it reactivates or upregulates the ability to [00:47:35] deal with stress from drugs.

If you take it in slightly higher doses, it reduces [00:47:40] the risk of all neurologic diseases because it increases the refolding ability [00:47:45] secondary to the heat shock proteins.

Dave: So Cellbex is basically a sauna in a pill? [00:47:50] Absolutely. Is it expensive?

Sandra: It's not cheap, but it's not expensive.

Dave: Was it [00:47:55] like a hundred bucks a month kind of thing?

Yeah,

Sandra: something like

Dave: that. Got it.

Sandra: Yeah.

Dave: Wow, that's, what if I take it [00:48:00] and then go into a sauna?

Sandra: No, I've never tried. I don't have time for saunas. I wish I did.

Dave: You [00:48:05] can actually do things while you're in the sauna.

Sandra: That's probably true. it's sort of fall [00:48:10] asleep. No, but Salbex, they've done a few studies and I'm really surprised they haven't done more.

[00:48:15] But if you have mild to moderate Alzheimer's, it actually can help significantly. [00:48:20] If you have severe Alzheimer's, it can't fix the damage. It can just prevent [00:48:25] more damage. And Alzheimer's is because it's, you know, most [00:48:30] neurologic diseases are protein misfolding diseases. So in essence, [00:48:35] They test for that one, but it helps with most of the neurologic diseases and it's an [00:48:40] ounce of prevention, right?

And most people are afraid of that sort of thing.

Dave: If someone in [00:48:45] my family or a friend had Alzheimer's I would say nicotine MCT [00:48:50] ketone dials and now cell backs [00:48:55] and that combination along with probably some toxin binders to get down lipopolysaccharides like an [00:49:00] activated charcoal and an increase in glutathione would Make them feel [00:49:05] way, way better.

Sandra: Oh yeah, no, without a doubt, that's a nice combination. I would add free radical [00:49:10] scavenging that gets through the blood brain barrier.

Dave: Okay, and this would be what, like?

Sandra: Simple stuff. Astaxanthin, [00:49:15] dulfenadine, simple stuff. I like to combine a fat soluble with a water soluble.

Dave: Okay. [00:49:20] Asazanthin is something I've talked about for many years.

It's in the eye formulas I take. It's a mitochondrial thing. [00:49:25] It's the colored compound from salmon. But what was the next one?

Sandra: Delphinidin comes from the [00:49:30] macai berry from Argentina. Delphinidin, okay. It's an extremely potent free radical scavenger. It's an anthocyanin. [00:49:35]

Dave: Oh, okay. Got it. Um, it's just

Sandra: water soluble.

I like, I like the idea of mixing my [00:49:40] solubilities to make sure I get to all the pieces and parts.

Dave: So similar to something like pycnogenol.

Sandra: Something like

Dave: that. Okay, [00:49:45] got it. So grape seed and grape skin extract or pycnogenol are similar but not identical. [00:49:50] Okay.

Sandra: Yeah, generally speaking in the terms of fruits and colors, anything in the dark purple [00:49:55] range is gonna roughly have the same effect.

Dave: Okay. Resveratrol, good or bad? [00:50:00] How much?

Sandra: You know, it's really hard to say because now there are all of these different [00:50:05] varieties and formulations. So if it's bioavailable or not bioavailable, or if it's in [00:50:10] a nanomicelle or it's of this if it's that, it's really hard to say. Generally [00:50:15] speaking, I go with 250 a day.

Dave: Got it. So you take a relatively high dose.

Sandra: [00:50:20] I do.

Dave: Do you like transresveratrol or resveratrol? You don't care.

Sandra: I don't care. [00:50:25]

Dave: Creatine, good or bad?

Sandra: I don't take it, but people love it.

Dave: Why don't you take [00:50:30] creatine? I take

Sandra: 70 other things and there's significant overlap and I just [00:50:35] looked at it and I go well I do other things that do the same thing so I just don't take it.

Dave: What drives water into [00:50:40] cells that you take the way creatine does?

Sandra: What drives water into cells? Anything that's osmotically [00:50:45] active.

Dave: So salt?

Sandra: Salt will do it lots of things do it, uric [00:50:50] acid does it, like tons of things are osmotically active. You

Dave: don't take uric acid.

Sandra: No, of course not. In fact, I'm like trying [00:50:55] to lower my uric acid anyway without a purinol.

But again, that's one of those goofy [00:51:00] medications that people don't recognize as longevity medicine. It's for gout.

Dave: Yeah.

Sandra: But it also treats [00:51:05] hyperuricemia, right? But by decreasing your uric acid, even if you have normal uric [00:51:10] acid levels, it decreases your inflammatory response. Decreases risk of autoimmune [00:51:15] disease as a whole lot of really good

Dave: pure and all, huh?

Yeah. Isn't there a downside to having [00:51:20] uric acid that's too low? You're all too low. You want medium. Well, okay. Again, this

Sandra: is all like [00:51:25] you don't want one end or the other, but you want like low medium. Okay.

Dave: Guys, what I'm going to do [00:51:30] after this is on Dave Asprey dot com. I will work with [00:51:35] my team to put together a cheat sheet that has the correct spelling of all these drugs and what we said.

So you can [00:51:40] do it. And I'm also going to include a link to Sandy's book. What's the name of your book? The [00:51:45] Kauffman Protocol, I think. Yep. Okay. And it's by Sandra Kauffman. That's her official [00:51:50]

doctor name. It's very, it's very fancy, but she's really Sandy. Would you take stem cells in [00:51:55] the United States from umbilical cords?

Sandra: No.

Dave: Why not?

Sandra: [00:52:00] I don't like the idea of stem cells. I don't like the idea of someone else's DNA being in my body. [00:52:05] I don't like the idea of introducing a cell with potentially [00:52:10] immunogenic surface markers into my body. As an anesthesiologist in the OR, we have spent [00:52:15] years making sure that the right person gets the right blood and it's tested in three different systems, et cetera, et [00:52:20] cetera.

So just taking someone else's cells and injecting them seems [00:52:25] extraordinarily dangerous.

Dave: I am, I am kind of shocked by the state of [00:52:30] stem cells within the United States because people are selling these. low [00:52:35] cost, you know, 400 a month or a thousand dollars for some [00:52:40] random stem cells drawn from an unknown number of umbilical cords from people with [00:52:45] unknown health that can't possibly be tested.

And the more of those you get in your body, the higher [00:52:50] the risk of an immune reaction. I'm not too worried about going say [00:52:55] down to Costa Rica and If it's one carefully tested and [00:53:00] very healthy umbilical cord that's culture expanded, right? And I'm okay to take [00:53:05] that risk because it's just one and if I'm getting a ton of benefit from it.

Okay, fine. [00:53:10] But I would not get stem cells in the U. S. right now. What I would do, though, [00:53:15] is I would get exosomes. Tell me about exosomes. Oh,

Sandra: you're singing my song.

Dave: Oh, yeah.

Sandra: Yeah, so stem [00:53:20] cells, 90 percent of the efficacy of stem cells is through the release of exosomes [00:53:25] anyway. Um, stem cells probably last about four to five, maybe six days in your circulation.[00:53:30]

And in that time, they do release a lot of exosomes, which is why they work, right? But it [00:53:35] is just significantly safer and significantly cheaper just to [00:53:40] use the exosomes. In this country, you can get them through amniotic fluid, you can get them through [00:53:45] cord, you can get them through a placenta they're traced.

You know, we know the health [00:53:50] of the mother. We know the health of all of the things that sort of go into it. You can buy [00:53:55] them. They are reasonably safe. I want to say 100 percent safe, but I have treated thousands of people. [00:54:00] No one has ever had a problem.

Dave: I've had about 50 vials of exosomes. [00:54:05] Maybe 54 last time we hung out.

Sandra: Yeah, no, it's true. And I, I inject it every [00:54:10] month. IV, I put it in my face, I stick it in my joints. I put them everywhere. [00:54:15]

Dave: Do you inject them in your face or just put them on your face?

Sandra: Oh, no, I inject them in the face.

Dave: You are, man, facial [00:54:20] injections hurt. I've injected a few things in my face, but, but, I mean, I, I've done a lot of painful stuff.

That is one that [00:54:25] is just nasty.

Sandra: It's not pleasant. The good news, however, is the, the viscosity of [00:54:30] exosomes is very, they're very liquidy. Uh, so you can use a [00:54:35] very small gauge needle. So in, in medical parlance, we use a 34 gauge. I use [00:54:40] a 34 gauge, which is really about as small as I can get. So the puncture [00:54:45] doesn't really hurt.

Sometimes it's the expansion of the tissue that can hurt in which case you just use the most [00:54:50] concentrated stuff that there is. The other caveat is that depending on what tissue source you [00:54:55] have, it can burn. So for example, cord by definition has some hyaluronic acid that [00:55:00] comes with it. That is acidic.

That hurts when you inject it. Therefore, if I'm going to do someone's [00:55:05] face with cord I'll put bicarb in it.

Dave: Okay. Which is Kostiacid.

Sandra: Exactly. So [00:55:10] there's ways around all of these things.

Dave: Whatever you're doing, like, do you do laser [00:55:15] resurfacing or something? Your skin looks better than it did last time I saw you.

Thank

Sandra: you. I have been lasering my [00:55:20] face every two months for 20 years. Wow.

Dave: What flavor of, what [00:55:25] flavor of laser do you use?

Sandra: You know, it's really funny. Everyone asks that and the answer is, I don't know. And that sounds really [00:55:30] horrible. I befriended a gentleman who has a mobile aesthetic laser company.[00:55:35]

Sweet. And he shows up with whatever lasers are in the back of his truck. And he hands me a set [00:55:40] of goggles and he says, This is gonna hurt. And, [00:55:45] uh,

Dave: sketchy street laser guy.

Sandra: No, no, no. I love him. He's not sketchy. I'm totally. [00:55:50] No, I don't know. So what happens is laser technology turns over so quickly that [00:55:55] places don't want to invest in the lasers.

So the smarter thing to do is to just [00:56:00] hire a company that does buy all of the lasers, right? So this particular company, they have a [00:56:05] gazillion different laser types brown spots, red spots, wrinkles, collagen production, [00:56:10] like all of these various things. So they, they have the newest, the latest, the [00:56:15] greatest.

And honestly, he shows up at my doorstep with whatever he happens to think that I need

Dave: [00:56:20] cool.

Sandra: He knows my skin better than I do cause he's been zapping me for years. And I just sit there and take it [00:56:25] and some days I look like a pepperoni pizza and other days I go, Oh, that wasn't so bad.

Dave: [00:56:30] Nice. When you talk about sitting there and taking it I've had laser treatments and I [00:56:35] don't remember which ones I've talked about them on some of the shows, but I'm not an expert in topical lasers.[00:56:40]

Uh, I knew more about like the deeper healing lasers, but some of those really [00:56:45] freaking hurt and you just like take a deep breath and you just accept it and [00:56:50] sometimes you look a little odd the next day, but usually I look all right and it can make a [00:56:55] difference. I'm it's probably been almost a year since I laser my face.

It's about time to do it again. [00:57:00]

Sandra: I did mine a month and a half ago, I guess. I'm overdue. [00:57:05] He sent me a text yesterday.

Dave: Okay. Got it. Having your own laser wrangler. That's, that's next [00:57:10] level longevity.

Sandra: No, no. It's not. It's spackle. It's spackle. Spackle. Fixing [00:57:15] my skin and zapping off little marks isn't going to change my longevity at all.

It's just going to make [00:57:20] me look better. And that is spackle.

Dave: You know, part of [00:57:25] longevity is looking better. The way you see yourself in the mirror matters for longevity. It really does.

Sandra: [00:57:30] You know, what's funny and I give myself a hard time, but I do do this and it's moderately silly. But [00:57:35] then you go to these conferences and these old dudes that look like they're going to die.

They're telling you like how to live [00:57:40] better. And you think, I'm not, I'm not doing what they're doing.

Dave: Yeah. It's a, I get some of that. I mean, I've [00:57:45] lost a hundred pounds and I don't know what to do. Like, I have skin, like a lot of skin, and it's [00:57:50] young skin, but like, what do you do if, unless I want to get fat again, then I could fill my face [00:57:55] out, but then I'd have to buy new pants, and pants are expensive.

That's

Sandra: a big problem. Yeah, I'm sure that's your main [00:58:00] concern. Yeah.[00:58:05]

Dave: How do you increase fat in the face?

Sandra: That's a tough [00:58:10] one. What, number one, you're gonna have to stop looking at red lights.

Dave: That doesn't seem like a good idea. Looking at red lights is [00:58:15] pretty good for you.

Sandra: I know, but I'm telling you, you're melting fat in your face, so [00:58:20] that's a bad idea.

Dave: You're also increasing collagen though, that's a tough trade off.

Sandra: Well, you didn't say collagen, you [00:58:25] said fat.

Dave: So I could be fat and wrinkly, or I could have no wrinkles and fat women,

Sandra: especially, [00:58:30] they don't look like they have that many wrinkles because it's all fat. It's all

Dave: stretched out, yeah.

Sandra: No, it is, right? And [00:58:35] it's filled with fat, right? Mm hmm. Anyway, but red light does sort of melt it.

So [00:58:40] that's that that's not helping you at all. Otherwise, you're stuck. You gotta either inject it [00:58:45] or and you can increase collagen production You can do a variety of things but fat that's a toughie. It is

Dave: one Okay [00:58:50] So I would like to set the record clear that it took almost 20 minutes For [00:58:55] Sandy's sad brain to remember the name of the Cialis like drug that she takes for [00:59:00] microcirculation Now that your brain that obviously needs no tropics has caught up with us.

What's the name of it? [00:59:05]

Sandra: Pentoxifilane. I would just like to point out that I haven't had my normal amount of Diet Coke [00:59:10] today. So I think that perhaps my neural circuitry is not going as well as it [00:59:15] should.

Dave: So you're suffering from a Diet Coke deficiency?

Sandra: I believe that's correct.

Dave: People are going to go [00:59:20] nuts when they hear that.

Oh man. Alright. [00:59:25] Speaking of nootropics.

Sandra: Mm hmm.

Dave: Are there any nootropics that you use [00:59:30] regularly?

Sandra: I use something called Mexitol.

Dave: Okay, what does it do? It is

Sandra: a benign [00:59:35] B3 derivative. It's like a

Dave: benfotiamine.

Sandra: Yeah [00:59:40] it's, it's, it's Russian. I love it. The reason I started using it was because it was also brought to AGE [00:59:45] production.

Of course,

Dave: yeah.

Sandra: That's huge in my world. I don't, I've tried a variety of them. I've tried [00:59:50] cerebral lysin. I've tried a variety of them. I kind of, like in surgery, we have a [00:59:55] rule like don't fuck with the pancreas. I have a bit of a rule like don't fuck too much with the brain. [01:00:00] We want to maintain homeostasis without causing it [01:00:05] undue stress.

So I really have concerns about too many [01:00:10] nootropics.

Dave: I don't like to mess with the pancreas. straight up stimulus like [01:00:15] Adderall or something. I don't even know that that should be a nootropic. But I

do find that manipulating [01:00:20] the catecholamine system is really important, and a lot of adaptogens that are also [01:00:25] nootropics do that.

Things like rhodiola.

Sandra: No, no, no. I mean, okay, fine. So yes, I do take rhodiola, [01:00:30] which is really interesting though, because, but I don't take it for that. I take it [01:00:35] because it changes the cytochrome system in your mitochondria so that you can adapt to hypoxia [01:00:40] better.

Dave: Mm-hmm .

Sandra: And as a mountain climber, it's incredibly important.

Dave: [01:00:45] You need to come into upgrade labs because we have a hypoxic trainer.

Sandra: I need that 'cause I've [01:00:50] been breathing into this thing that's, it's like this little funnel deal.

Dave: You don't wanna do that. [01:00:55]

Sandra: Well, I've been there yet.

Dave: I started out years ago. It has aluminum particles in there. A [01:01:00] lot of them. It's gonna mess up your lungs.

Sandra: That's probably true. Well, a good friend of mine is a lung expert, so [01:01:05] I will go see what he has to say. But I would love to use the hypoxic lab, because I think hypoxia is [01:01:10] better for you than, uh, hyperoxia.

Dave: Oh, I think there's a role for both, isn't there? [01:01:15] Like, are you opposed to hyperbarics?

Sandra: Hyperbarics has its place if you [01:01:20] are if you have traumatic brain injury or you have some sort of microcirculation [01:01:25] problem.

For diabetics, wound healing, capillary problems, that when you can't [01:01:30] get the normal amount of oxygen to tissues, It has a role for normal longevity. I think [01:01:35] it just produces too many free radicals, and I don't think it's a great idea.

Dave: What about the Israeli [01:01:40] studies looking at doing?

Sandra: They pulsed it, right?

Yeah, they telomere deal. So I've had [01:01:45] long conversations with Bill Andrews about this. And our hypothesis is that when you measure [01:01:50] telomeres, right, you're measuring them from a, you're, you're drawing blood, right? You're doing a liquid sample [01:01:55] and you are looking at whatever cells are in the circulation.

And the thought is that by. Pulsing [01:02:00] this, you're actually releasing more cells that are newer into the circulation. Therefore, by [01:02:05] average, the telomeres are longer, but they're not actually longer.

Dave: Oh, interesting. You just [01:02:10] caused some new young cells to come in.

Sandra: Yes.

Dave: That's fascinating. Because, I

Sandra: mean, telomere science is [01:02:15] really interesting because every cell, if you think about it, right, you have [01:02:20] four telomeres per chromosome and 46 chromosomes.

So you're looking at [01:02:25] 184 ish, uh, telomeres per cell. Right? [01:02:30] And then, depending on where the cell is in the tissue, where the tissue is in the body, there is [01:02:35] no way that any one number or two, or even a decent statistical [01:02:40] distribution can tell you what your true telomere lengths are anywhere.

Dave: Telomere testing is so [01:02:45] sketchy.

I've seen people change by 20 years in one week on blood tests. It's not [01:02:50] It

Sandra: doesn't, right. You can't, because you can't, I mean, the idea and the theory, [01:02:55] fantastic.

Dave: So we're both, [01:03:00] we know telomere shortening is a cause of aging, it's just measuring it is really hard to do. Yeah, correct. [01:03:05] I

wouldn't rely on that just as my only source of longevity data. Exactly. [01:03:10] What's your favorite test to measure someone's age?

Sandra: That's a good question. What I think is funny [01:03:15] is the reverse.

People come to me with their labs and the one that gives them the [01:03:20] best number is their favorite.

Dave: I know, right?

Sandra: Right? Oh, but this one I'm only 27 and I'm actually [01:03:25] 63. That's a really good question. I usually like to take three or four and sort of combine them. [01:03:30] I love the epigenetic clocks. Yeah. I love glycation scores.

I actually have this [01:03:35] really cool gizmo gadget that comes from Amsterdam and you hold it against your skin and it tells you how [01:03:40] glycated your skin is.

Dave: Ooh, I want one of those.

Sandra: I think that is a tremendously powerful tool. [01:03:45]

Dave: And of course, your aggressive anti glycation regime is [01:03:50] probably

Sandra: Really, it really helps.

Dave: Yeah. As a top longevity doctor, do you [01:03:55] use bioidentical hormones? I don't. Is it because your levels are [01:04:00] adequate?

Sandra: Oh, I take hormones. I take birth control.

Dave: Oh my god, you're like the worst [01:04:05] longevity doctor ever. Just kidding. You take birth control? I do. Have you not seen the [01:04:10] studies about what that does for your risk of cancer and all these other things?

Sandra: But you have to [01:04:15] understand why it causes cancer.

Dave: Okay.

Sandra: Right? So. As you get [01:04:20] older, right, you have mitochondrial failure, right, which leads to [01:04:25] ovarian failure, which leads to menopause, which leads to the inability to make [01:04:30] specific hormones. We're pleading those hormones, which obviously have to do within five years or the [01:04:35] hormone receptors get downregulated and then you're screwed.

So you clearly need some sort of hormone [01:04:40] regulation, right? If you can come up with a pattern that matches that [01:04:45] of a 30 year old, you are creating a homeostatic [01:04:50] situation, right? What you need to do to avoid the cancer stuff is you need to avoid. [01:04:55] Inflammation. Inflammation. You need to avoid free radicals.

I mean, there's a list of [01:05:00] things that cause DNA damage which leads to cancer, and directly [01:05:05] that does not do it. That's an indirect effect that you can block.

Dave: It's a [01:05:10] blockable thing. They do a bunch of other things to the brain, though, too, don't they?

Sandra: The answer is [01:05:15] you need hormones and the whole bio identical thing is honestly, [01:05:20] there's just hormones.

Dave: I mean, they're processed differently in the liver and [01:05:25] in the body and they have different effects on receptors. Yes,

Sandra: but no, we know the birth [01:05:30] control works.

Dave: It works for birth control, but we know it has a lot of side effects too. [01:05:35]

Sandra: Not that many.

Dave: Oh my gosh, I've had like 10 experts on who would probably like [01:05:40] be red in the face and angry.

Sandra: I read through the whole thing and I [01:05:45] made my scientific decision and this is what I do for myself. I do not do hormone [01:05:50] therapy for other people, though, so if you're afraid that I'm like, you know,

Dave: being

Sandra: toxic to other people.

Dave: I'm not trying to [01:05:55] convince you to change, I'm just, I want to learn, I'm just curious.

Sandra: My intent on [01:06:00] longevity is to preserve the physiology of a 30 year old.

Dave: You and I are [01:06:05] aligned on that and you think birth control is going to do that for you. [01:06:10] That's, I can't argue with that. I've

Sandra: maintained my physiology. [01:06:15]

Dave: For, uh, for listeners, I don't think this is a strong [01:06:20] argument that you should go out and get on birth control without looking at what it's going to do for your sensing of [01:06:25] mate selection and a lot of the other things, but if you want to go down an advanced longevity track in [01:06:30] Monroe and stuff, you be you, and I totally support that.

I just, I, you know, [01:06:35] I've looked a lot at women's hormones and You know, worked on fertility and stuff like that. And [01:06:40] yikes there's a lot of dysregulation that can happen. And I totally believe just like you do [01:06:45] diet Coke and cupcakes and you're like, okay, these have the things I'm going to counter them.

And [01:06:50] that is like the most powerful, like I've got this perspective I've ever seen. So [01:06:55] I like that and saying, I want the benefits of birth control pills. And I can deal with whatever [01:07:00] potential downsides. I get that.

Sandra: I like the cycling. I like that it's a pattern. [01:07:05] That's really

Dave: important. I

Sandra: mean, I think that it's the idea, right?

Because the regular, the [01:07:10] hormones that they put those old ladies on, even if they're bioidentical, right? [01:07:15] They don't. They're, they're not in a homeostatic pattern.

Dave: That's why I, I've recommended the [01:07:20] Wiley protocol for a long time. She's the only person that I know of who regularly does that.

Sandra: They should [01:07:25] vacillate.

They should have normal homeostatic patterns. That's why I do [01:07:30] it.

Dave: Okay. That is a really good argument, especially for people who are in [01:07:35] menopause, potentially.

Sandra: But I mean, the deal is, and women ask me this all the time, [01:07:40] so when you are young, 35 to 40, Optimize your mitochondria as much as [01:07:45] possible. When things start to fail, you gotta pour that sucker on.

Every [01:07:50] mitochondrial optimization possible. Because fertility is the canary in the coal [01:07:55] mine of longevity. Soon as you hit menopause, that's the first system to go. You know [01:08:00] that, that, that, But everything else is soon to follow, right? So [01:08:05] block it, block it, block it. Avoid menopause, number one. I'm just preaching the choir, clearly, [01:08:10] that's not your problem.

But if you can put it off as long as possible, and then when it's, then when your [01:08:15] hormones do start to fall, don't take mega doses. You just need to take Fill it in. [01:08:20] Yes. You fill it in with the same pattern as long as possible, [01:08:25] knowing that yes, there are side effects. But they can be fixed and addressed.[01:08:30]

Dave: How are your cortisol levels? Low. You have [01:08:35] low cortisol?

Sandra: Yeah, I'm great.

Dave: You realize low cortisol is four times more deadly than high cortisol, [01:08:40] right?

Sandra: I have low normal cortisol. How's that? How's that? Like, I'm not dying or anything. No, but like [01:08:45] when you say you have high cortisol, like you're stressed out.

Right. You say you have normal cortisol level. [01:08:50] Again, it's, it's also circadian. So when people go, well, what's your cortisol? Well, what time did you measure [01:08:55] it?

Dave: And did you work out right before? What were you

Sandra: thinking about? What was your stress level? Does that, that the other all of [01:09:00] my hormonal levels are completely within low normal levels.

Dave: Low [01:09:05] normal levels for your age or low normal levels for a 30

Sandra: year old.

Dave: Good. That [01:09:10] is beautiful.

Sandra: Again, everything is based on me wanting to be a 30 year old. Clearly I'm not, but [01:09:15] that's the goal.

Dave: When We hit about 35, our [01:09:20] bodies, and this happens more in women than men, but it happens to both, our bodies make less DHEA, [01:09:25] they make less pregnenolone, and they make less progesterone, and these are things that [01:09:30] counter adrenaline and cortisol.

Do you supplement any of those?

Sandra: So that's a good question. [01:09:35] So, what I do, Well, so what I do and what I do for other people is slightly different, [01:09:40] right, because I'm a bit of an experimentalist. The first thing I do in terms of longevity [01:09:45] is I fix the cell. You have to see, a cell can make [01:09:50] 10, 000 different proteins, and as a cell fails over time, you can pick [01:09:55] each one of those 10, 000 things and supplement it, or you can fix the factory that's [01:10:00] supposed to make all of them, right?

So I start with fixing the factory. [01:10:05]

Dave: Okay, I start with mitochondria, which powers the factory, but isn't the full factory.

Sandra: So [01:10:10] all of the seven tenets of aging must be addressed. You've got to optimize your sirtuins, your AMP [01:10:15] kinase, your NAD, your mitochondria, all of them. Fix the [01:10:20] factory.

Dave: Okay.

Sandra: Right.

Dave: If you do that, will you have DHEA levels of a young person?

Sandra: Yes.

Dave: You [01:10:25] do? So you make enough DHA in your body all by yourself. That's cool. If you start

Sandra: young enough, you don't need to [01:10:30] do any of that.

Dave: If you start young enough, yes.

Sandra: Right? If, if so, if a 30 [01:10:35] some year old comes to me, as soon as they hit 35, protocol, right? This is what we're doing. [01:10:40] We can stave off menopause.

We can stave off making The, or not having to make all of these [01:10:45] additives, right? The problem is that if someone comes to you as a 55 year old, they're like, Oh, now it's time. [01:10:50] Now you're behind the eight ball. But you put someone on a protocol for nine months, six to nine months generally, [01:10:55] and then you test these things.

And I will tell you that the, what you have to replete is way less than what you would have [01:11:00] before.

Dave: So they're, they're getting younger

Sandra: when they're getting younger, but they're doing way [01:11:05] better. Their

Dave: cells are getting younger then cause they're acting like younger anyway.

Sandra: Yeah. We're fixing them.

Dave: One of the [01:11:10] reasons that I started the biohacking movement.

Is that no [01:11:15] one 35 and under cares about longevity as the number one thing on their to do [01:11:20] list. It's always like number 12 until you hit 45, 50, 55. Oh, and it's [01:11:25] much more expensive. I'm fortunate that in my mid to late twenties I hung out with a [01:11:30] bunch of people in their seventies and eighties doing longevity because I had chronic fatigue and all that.

So [01:11:35] I'm like, how do I talk about longevity in a way that would be attractive to me when I'm 20? Because it's [01:11:40] almost free to keep your health when you're young and it's very expensive to get it back when you're old. So [01:11:45] it's a great investment, but it has to be in a language that matters for [01:11:50] someone young.

And Biohack has really done that. It's global movement and all, and for people [01:11:55] who are listening, measure your hormones. Like, do it one time in your 20s so you know what they should look [01:12:00] like when you're 30 And you can do that. It's dirt cheap now. Axo. health is a [01:12:05] way to do it. And there's all kinds of online services like that.

Just know what they are so you know what [01:12:10] they ought to be. If you could go back in time to yourself when you were 20 and give yourself a [01:12:15] couple pieces of longevity advice, what would you say?

Sandra: Oh my god. Well, first I would say there's a thing called [01:12:20] longevity.

Dave: Okay.

Sandra: Right? Like, I didn't discover this until I was 45.[01:12:25]

And at that point there were pockets of people that knew things. I knew nothing. I never heard of it. [01:12:30] It dawned on me sitting in my office one day that this aging shit was gotta [01:12:35] go. Like I, I started from scratch. I will figure this out. I had no one to ask, no one to [01:12:40] turn to. What I would have loved to have known, A, that it existed.

[01:12:45] B, what cells were actually doing? When were they going to crump out? What could I do at the [01:12:50] time? I mean, you know, I'm a child of the eighties. We laid out in the sun with baby oil. [01:12:55] We ate a shit ton of junk food. We didn't know, but at the same [01:13:00] time we were mega athletes like I exercised. every day, studied every [01:13:05] day.

If I had just knocked out a few of the bad habits, clearly I'd have been better off. And [01:13:10] if I knew that aging started at 35 instead of me starting at 45, God, I'd have gained [01:13:15] 20 years of my life. Right? I mean, I lost a good 10 years, but I think I am [01:13:20] better off at 56 than I was at 45.

Dave: [01:13:25] Everyone can do that too.

And the cool thing is if someone who's even 25. [01:13:30] You're not going to do it for longevity. You're going to do it for physical and [01:13:35] cognitive performance for your energy, for your happiness.

Sandra: But the, but the key is knowing what [01:13:40] changes because you don't truly start aging until 35 [01:13:45] below that. No, it's true.

But like sirtuin deficiency, NAD deficiency, but what [01:13:50] you are doing is you need to worry about your epigenetics. This is what I tell patients under [01:13:55] 35. It's epigenetics and it's cancer reduction risk. [01:14:00] That's what you're worried about. And just nutrient homeostasis. Like these people don't have to go and buy a [01:14:05] gazillion dollars of all the shit that we have because they don't need it.

But they don't. They don't need [01:14:10] NAD. They don't need resveratrol. They don't. They don't. Because they're not You don't have to boost [01:14:15] the sirtuin level that hasn't fallen yet, but they are [01:14:20] responsible for their epigenetic patterns that start in the 20s and then will continue. [01:14:25] You are increasing DNA damage, right, by being out in the sun.

So free [01:14:30] radical scavenging is important. Repairing your DNA is important. And if you have any family [01:14:35] issues that's when those things are going to, going to start being important. You know, if you have a family history, [01:14:40] everyone's hypertensive, everyone's got coronary disease, et cetera. You address those early, [01:14:45] but that's not true longevity.

That's just preventative medicine.

Dave: 48 percent of people under [01:14:50] age 40 have early onset mitochondrial deficiency. According to studies, [01:14:55] not all of them, but many of them. Right. [01:15:00] So aren't they aging because their mitochondria are already broken?

Sandra: Depends. Depends on how you define [01:15:05] aging. That's just sounds like disease.

Dave: Is aging and disease?

Sandra: It is, [01:15:10] but. I mean, in my, in our world, it is. In the medical world, and [01:15:15] I, I wear several hats, it's not.

Dave: Got it.

Sandra: A normal, healthy, [01:15:20] as we would define, healthy human at that age should not have mitochondrial failure. [01:15:25]

Dave: I certainly did. It sucks. I wouldn't want to go back and do that again.

Sandra: Right. But then not, but, but [01:15:30] you. We're not healthy.

Dave: That's totally true.

Sandra: I like the fact that we don't agree on anything.

Dave: [01:15:35] We don't have what?

Sandra: I said I like the fact that we don't agree on anything.

Dave: Oh, we agree on tons of things. it's [01:15:40] just that when we disagree, it's that I'm right. And that's okay. I mean, you'll, you'll learn.

Yeah. When, when, [01:15:45] once you get a little older.

Sandra: Yeah, that's true. Aren't we the same age?

Dave: I'm younger than you. [01:15:50] Oh,

Sandra: okay.

Dave: Well, I mean, I'm about 35 on the calendar. I signed on the calendar on [01:15:55] my lab tests.

Sandra: That's funny.

Dave: So that's what I identify as. So, you know how you [01:16:00] fill out those forms and they tell you like, you know, what's your, what gender do you identify as?[01:16:05]

Well, when you get to the age, they're gonna ask you what age you identify as. And so I think that all of those surveys are ageist [01:16:10] if they don't allow us to just pick whatever age we feel like that day.

Sandra: That's fair. That's fair.

Dave: Yeah, [01:16:15] that's fair. Are you feeling triggered?

Sandra: No.

Dave: I identify as triggered.[01:16:20]

Sandra: I'm on lithium. Nothing triggers me.

Dave: Let's talk [01:16:25] about lithium.

Sandra: Okay.

Dave: Okay. I have talked about lithium orotate as [01:16:30] a supplement for mood and for longevity, why I think since the first year I [01:16:35] wrote about longevity 15 years ago on my blog and you're not a [01:16:40] fan of orotate compared to a stronger form. Talk to me about lithium.

Lithium.

Sandra: All right, [01:16:45] so, when I go through my seven tenants, I pick a subject and I plow into [01:16:50] it. I think, okay, how can we fix this? And one of the really interesting things I ran into several [01:16:55] years ago was lithium. Because great studies people that have [01:17:00] bipolar disease have statistically shorter telomeres.

People [01:17:05] that are bipolar on lithium for longer than two years have statistically. Longer [01:17:10] telomeres. We don't have any studies of normal people on lithium because normal people don't [01:17:15] take lithium. So clearly there's some effect that the lithium is having on [01:17:20] telomeres. We don't really exactly know what it is.

We know it's free lateral scavenger. We know it [01:17:25] computes with magnesium. It does a variety of things. But we also know that populations that [01:17:30] live in areas that have more magnesium in the drinking water or the plant source or in any food [01:17:35] source, all cause morbidity and mortality goes down.

Dave: So more magnesium is good for you.[01:17:40]

Sandra: More lithium is good for you. Magnesium and lithium compete in the body. [01:17:45] Okay. Um, however, so in some places it's good, in some places it's bad. [01:17:50] So you need enough lithium to decrease all cause morbidity and mortality and increase your [01:17:55] telomeres, but not enough where it's going to interfere with your magnesium.

Okay. Right? [01:18:00] So, if, as a physician, like, a few milligrams of magnesium You know, [01:18:05] ha, whatever. So I thought, well, how much magnesium, or how much lithium, sorry are these [01:18:10] bipolar folks taking? And a standard bipolar dose starts at 300 [01:18:15] milligrams and then it goes up to 600 and then 900. And once you get to 600, the side effects start [01:18:20] kicking in.

because of the issues with magnesium and then a variety of other factors. So I [01:18:25] thought, well, okay, if most people can tolerate 300, why are people taking [01:18:30] two to three milligrams? So I decided to take as much as I could while trying to avoid side [01:18:35] effects.

Dave: And the side effects are depression?

Sandra: No, like physiologic stuff, some kidney [01:18:40] stuff risks of a few other diseases, just side effects that we don't [01:18:45] want.

So I decided on 75 milligrams a day.

Dave: Of not lithium orotate. [01:18:50]

Sandra: No, no, this is pharmaceutical grade lithium.

Dave: And that's just straight [01:18:55] lithium salt.

Sandra: Yeah. Okay. Exactly. It's easily obtainable. It is dirt [01:19:00] cheap. It is mood elevating or at least stabilizing. Unlike a lot of [01:19:05] antidepressants, people have to be on them for a while.

And then when they come off of them, they feel like absolute [01:19:10] garbage. This has zero on off. You just feel better. [01:19:15] So, I'm thinking that your mood is better, you're not making rash decisions, I've just decreased [01:19:20] all cause morbidity and mortality, and if I'm on it for longer than two years, I can only benefit [01:19:25] motelomeres.

So I think it's like a win all the way around.

Dave: That is, that is fascinating. [01:19:30] Why wouldn't people who can't get drugs the way you can just take Orotate?

Sandra: You [01:19:35] can, just the milligramage is significantly lower. You have to take a lot of pills. Yeah. Got

Dave: it. That's [01:19:40] intriguing. I'm, I'm interested to try it. The difficulty is that if it changes your affect [01:19:45] or your mood, you may not notice it unless it's pretty

Sandra: I think people feel it.

I think, and I think [01:19:50] it's 75 milligrams and I'm small. Right. So for anyone that's bigger than me I don't think it's [01:19:55] going to do much. A friend of mine takes double that. and he seems to do absolutely just [01:20:00] fine. But I think 75 is a good test. Plus they come in 300 milligram tablets. So it's really hard [01:20:05] to, you know, if you have it and then half it, it's reasonable.

Dave: It's pretty good at quarters [01:20:10] and you're good to go. Okay.

Sandra: Anything smaller than that is just going to be crumbs.

Dave: Yeah. Okay. Yeah. I have a [01:20:15] little drug dealer scale, but that would be a lot of work in the morning and I'm not going to deal with that. Okay. [01:20:20] It appears that Bipolar disorder is at least partially a [01:20:25] circadian disruption.

I know more than a few people who use the [01:20:30] very darkest of the, the true dark glasses who are saying, well, if I use these at [01:20:35] night, my bipolar symptoms go down substantially. Do you know the connections [01:20:40] between bipolar and circadian systems?

Sandra: I actually do not. [01:20:45]

Dave: It's, it's interesting. It's probably in PARP or BMAL or something.

There's gotta be something going on in there. I'm [01:20:50] sure

Sandra: there

Dave: is. Okay.

Sandra: Yeah. I mean, obviously there's the, the SCN in the back of the brain. [01:20:55] Information comes into the retina, process is there. I mean, the same patterns are in your SCN that are in [01:21:00] every cell of your body in terms of the circadian patterns except for testicles, which [01:21:05] is really quite interesting.

They are not circadian.

Dave: Interesting. I did not know that.

Sandra: STs and [01:21:10] thalamus are the only cells that do not synchronize.

Dave: That's weird.

Sandra: Well, [01:21:15] it's, it's the I guess I'm always ready sort of male mentality.

Dave: So I've been regularly [01:21:20] tanning my butthole and my balls. Is that a good longevity strategy?

Sandra: Certainly [01:21:25] entertaining.

Dave: Okay, for [01:21:30] the record, guys, there is evidence that sunlight on your scrotum will increase [01:21:35] testosterone. Or you could just use red light, which is what I actually do. If I'm in the sun, [01:21:40] I'm probably not going to have my clothes on if it's a place where I can't so I might get some sun on them But it's not [01:21:45] intentional and sun on your butthole does nothing except for get you in the New York Posts with an article that [01:21:50] says Biohacker bro burns bums and yes that did happen to me.

So that was a joke. [01:21:55]

Sandra: Okay, that's that's that's fantastic

Dave: Got it. Just just [01:22:00] checking all the angles.

Sandra: I think that's great. I'm glad your scrotum is, uh, you know adequately [01:22:05] Radiated.

Dave: We just had to share about all the, [01:22:10] you know, all the longevity things that are possible. That's

Sandra: fantastic. I'm, I'm sorry I don't have a scrotum [01:22:15] for which to, uh, to shape, you know, challenge that.

Since we're talking about

Dave: that, this is very [01:22:20] important science. A group, a research group, went out and took a picture of a [01:22:25] thousand scrotums. And then they asked a large ish group of [01:22:30] women to rate them on a scale of 1 to 10, with [01:22:35] 5 being average, 1 being ugly, and 10 being attractive. No scrotum scored [01:22:40] above 5.

In other words, they're just not attractive. So I don't think you [01:22:45] really want one. I mean,

Sandra: if I did not realize this, so I was in New York City last [01:22:50] weekend and you know, the giant gold bull on Wall Street, [01:22:55] people pose to get their picture taken with the testicles.

Dave: That's hilarious. It was [01:23:00]

Sandra: subzero. It was fucking freezing.

And there was a line of at least 50 people [01:23:05] waiting to have their pictures taken with the scrotum. I was, I was taken aback. [01:23:10]

Dave: People are funny. You go to the Sedona Whole Foods in the parking lot, there's a [01:23:15] statue of some Viking or something and underneath it's, there's probably no Viking, must be a Scottish [01:23:20] person because they're wearing a kilt, but you can look underneath it and there's balls and people.

Same thing, they have to get a Are they

Sandra: hairy? [01:23:25]

Dave: It's made out of bronze, so I don't think so. Kind

Sandra: of hard to say. I didn't really feel the need to. That might [01:23:30] be determinant of like ugly or not.

Dave: Hmm, never thought about it, but I'm just thinking you don't want one. [01:23:35]

Sandra: I don't, but thank you though.

Dave: Now that we've gone completely off [01:23:40] of the important topics, I do want to ask a final question.

Men and women are different. [01:23:45] These principles of longevity apply to men and women very, very well. What are the [01:23:50] three things that women need to know versus men for longevity?

Sandra: I think the [01:23:55] biggest thing is that prior to [01:24:00] menopause, you have to stick with basically the same principles. Basically, [01:24:05] right? Males and females, sirtuins, [01:24:10] NAD, Um, all of those things are roughly equivalent, roughly equivalent.

As [01:24:15] soon as you start having hormonal failure, things change [01:24:20] dramatically. And it's extraordinarily [01:24:25] important to recognize that and to fix it within a five year time period. [01:24:30] Because Cardiovascular risks shoot through, osteoporosis shoots through, [01:24:35] so many interesting, like, issues. So, we as women have to be [01:24:40] monstrously careful, like, I, I, I have people Like [01:24:45] osteoblastic activation is crucial for women more than men.

Inflammatory issues are more [01:24:50] crucial for women because inflammatory issues are associated with activation of [01:24:55] osteoclasts, which break down bone. So that's why we're set up for [01:25:00] osteopenia as we get older. huge. As well, women live [01:25:05] longer, but we live worse. We are, we have Alzheimer's. We have, we're set up [01:25:10] for our immune diseases.

There's something in us that is just different [01:25:15] and we, you have to address them. So more free radicals stuff for the brain. [01:25:20] The things that you listed for the brain, fantastic. I like to be proactive. Bermudine [01:25:25] is huge, protects the brain, also protects the DNA, reduces risk of autoimmune [01:25:30] disease. there are a variety of things that fall into that category, but we definitely have a few things that [01:25:35] we just have to be adamantly aware of.

And I would love to go back to the men thing and say like, what's [01:25:40] important for you guys, but I'll say I don't care.

Dave: One of the things that lowers [01:25:45] all cause mortality is having physical touch from a [01:25:50] partner. So I care about the health of the women in my life. Because I'm [01:25:55] really just using them to touch me so I can live longer. Or maybe there's more like [01:26:00] oxytocin and intimacy and polarity and all that kind of stuff.

I think [01:26:05] relationships are part of a longevity strategy. Of

Sandra: course they are. Of course they are. I don't tend to mention it publicly [01:26:10] because some people are fortunate and they have relationships, and other people are less fortunate and they doubt. [01:26:15] And it's kind of not fair to say to people, I'm so sorry you're alone and you're gonna die early.[01:26:20]

That's just not fair. So the answer is, you're absolutely right.

Dave: Why is that not [01:26:25] fair? It's like, do something about it. Like, I'm, I'm so sorry you're obese. Lose some weight. There's a thousand ways to, I'm so [01:26:30] sorry to drink diet Coke. Stop drinking it. Like there's all these things you could do.

Sandra: That's really funny.

That's really funny. But [01:26:35] in all

Dave: seriousness, it's not like you can't learn relationship skills. It's not like you can't do work on [01:26:40] yourself, right? Like it's, it's possible.

Sandra: It is possible. I know a lot of single [01:26:45] people that want to remain single. I know a lot of people that are, you know, out of long term [01:26:50] relationships.

They're not there yet. Be that as it may, it's easy to talk about things [01:26:55] you can do for yourself. It's much harder to bring someone else into your mix. If you [01:27:00] have it, yes, it's extraordinarily helpful. If you don't. It [01:27:05] is what it is.

Dave: That is very, very true. That is why. I [01:27:10] think it makes sense to take care of the men in your life.

And men, we can take care of women. Like, it's a team effort here.

Sandra: [01:27:15] That's, that is, that is fair. But for example, I don't spend a lot of time looking up, like, ED. Why? [01:27:20] Because it's not my problem. That's

Dave: so brutal.

Sandra: No, it's [01:27:25] true. Like, I'll be reading something that says prostate issues and I go,

Dave: If you're with someone [01:27:30] who had AD, it would be your problem.

Sandra: That clearly

did. Here, take my thoughts [01:27:35] for yesterday's snippet.

Dave: Yeah. Oh my God. That, that is the [01:27:40] funniest thing. Sandy, every time we get to hang out, it is, I'm like, what is [01:27:45] this person putting on her plate? Like, why did she do all this stuff? But you have a very fast [01:27:50] and fascinating and well informed mind and.

I, I say that you're weird and [01:27:55] crazy and so am I, and I very much admire your [01:28:00] willingness and ability to say, yeah, that's not ideal, so I blocked it, and then to [01:28:05] do what you want to do, like, it just takes a certain amount of, of, Actually, I really don't like [01:28:10] the word empowerment because it's like that, like someone else is giving you power, but it actually just takes a certain amount of power [01:28:15] and sovereignty over your biology to do that.

And I, I greatly admire [01:28:20] your mindset and all this stuff. And it doesn't matter if we grant diet coke and birth control pills or not. Anyone [01:28:25] listening, you have to choose your path. And my job is to bring awesome people on the show [01:28:30] and to educate you so you can make better choices. And there's so much knowledge and wisdom [01:28:35] here.

And so go to Kauffman, K A U F M A N N [01:28:40] 1 F 2 N's protocol. com or just go to Dave Asprey. com [01:28:45] and get the notes for this episode where there'll be lots of links to Sandy's work. You can also [01:28:50] pick up your book on Amazon or books. What's your best book?

Sandra: [01:28:55] The first one is more introductory. The second one has more stuff in it.

Three and four are [01:29:00] on the way.

Dave: Okay. Beautiful. And those are on Amazon. Sandra Kaufman is her name [01:29:05] on the cover. Thank you so much. I can't wait to go to dinner with you and all of our other health friends and [01:29:10] just do some more nerding out on longevity.

Sandra: This is going to be great. Thank you so much.

Dave: [01:29:15] See you next time on the human upgrade [01:29:20] podcast.