



Transcript of “The Disease Delusion with Dr. Jeffrey Bland”

Bulletproof Radio podcast #139



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Dave: Today's cool fact of the day is that scientists are studying bacteria's ability to transport specific toxins into your cells using a coiled amino acid chain that's actually mechanically spring loaded. When the bacteria gets ready to release toxin, the spring uncoils the way a snake launches when it's going to spit some venom.

The energy released from that amino acid chain transports the toxin chemicals through the cell membrane. That's cool and we had no idea there was a physical component to toxin delivery but that's how sneaky those little bastards are when they get into your body when they shouldn't.

You're listening to Bulletproof Radio and I'm Dave Asprey. My guest today is Jeffrey Bland, a PhD and the founder and president of the Personalized Lifestyle Medicine Institute. He's also C.E.O. of Kindex Therapeutics, both based in Seattle, Washington.

The reason Dr. Bland is on the show today is that he's an internationally recognized leader in nutritional medicine. He's got about 35 years of experience in it based on biochemistry, not just looking at the medical side of things, although I appreciate both. Doctor Bland, or Jeffrey as I'll call you on the show, Welcome.

Dr. Bland: Dave, thanks so much. What a pleasure it is to be with you and your listeners.

Dave: It's unusual to have somebody on who studied clinical biochemistry and is a fellow of the American College of Nutrition. There are a lot of people who do nutrition and maybe exercise or things like that from the side of the world but you've got a deep chemistry background. What brought you from chemistry over into biochemistry and then nutrition?

Dr. Bland: That's a really great question. Actually, what happened to me probably is not unlike many people that end up in this field of asking questions about how we get sick, how we prevent being sick and how we maximize our opportunity to be healthy throughout the course of our biological lifespan.

What happened to me was in medical school, I was sick of continually asking the question to my professors why people got these illnesses, be it heart disease, diabetes, cancer, arthritis, digestive disorders, dementia whatever it might be. The answer that was basically given because probably as everyone knows, medical school is very rote and it's focused on memorization or recitation. The answer I

got was, "You know, you'll have a lifetime as a professional to ask those questions but right now, you need to just stick to the script and you need to memorize these responses and on demand, recite them correctly."

I was a pretty impatient student. That didn't really fit my personality archetype too well and so I kept asking these questions.

Finally my advisor in medical school like going in my third year said, "You know, it might be wise for you to consider taking a PhD while you're doing this because PhDs, they're like accredited and stimulated and actually reinforced to ask questions. That's what it's all about and maybe that will get rid of this energy you got then you can remain focused on the right stuff over here on medicine."

I moved over, got a PhD advisor in neurophysiology and neurobiochemistry and started working on to which is the talks. The reason that I was working on that was because it had a very, very interesting mechanism of action in blocking certain ion channels in the nerves and you could really start examining certain neurological functions at the biochemical and cellular level in ways that you could not do with other drugs. So I basically became a detrode talks and buffer page expert over the course of the next few years, got my PhD and decided that this was really an area I wanted to focus on is understanding the mechanism at the cellular, tissue and organ level is how we get sick.

My first graduate student after I got in a faculty appointment as an academic was a guy who came in and he's just retired actually as the past head of the department of internal medicine at John Hopkins Medical School. That shows you how long ago it was but at the time, he was a medical student. He said to me, he said, "Jeff, I'd really like to study vitamin E." I knew nothing at all about vitamin E at all. This was 1970 and knew nothing about vitamin E but it sounded very interesting. He was a very ambitious student so we collaborated.

We were very lucky. We got some very remarkable discoveries made about the mechanism action of vitamin E. One day I was in the store with my young son at the time in the grocery store. It was a Saturday, I was doing some shopping, bailing my wife out. I happened to look up at the checkout stand and it has all the tabloid magazines and there was the National Enquirer. The headlines of it was something like academic or professor finds secret to aging. I thought, "Wow, that's kind of interesting." I picked it up and pulled it out of the newsstand. Low and behold, here's my picture on the cover. It was me that they were talking about from my vitamin E work. My claim to fame is I was right next on the cover of the National Enquirer, that issue, to Elizabeth Taylor, who is also talking about aging but from a slightly different perspective.

That changed my career from that point on. From there then got quite a bit of notoriety for talking about the mechanisms of free radical aging, oxidants and antioxidants. I was one of the first people to really write review papers on antioxidants and oxidants. I was funded very heavily that some big research that we did by companies that made vitamin E. At that time, It was Hinkle and Eastman Kodak. We published probably over 50 papers in the scientific literature, wrote several books. It launched my career as a nutritional biochemist and clinical biochemist. It was never what I intended but it just became such an exciting opportunity and from that, the last 35 years goes by very quickly.

Dave: Does it make you mad if people say you discovered or invented vitamin E, not that you could invent something that's always existed.

Dr. Bland: I think it is interesting when first of all that people introduce me as a nutritionist because I always wonder who they're referring to. I have to remind myself they're talking about me.

Secondly, about the early days of vitamin E, 1970 was about 30 years after vitamin E have actually been discovered by a woman, Doctor Harold at the University of California at Berkley who actually was working on vegetable oils and found that if you completely stripped vegetable oils from what was later to be called oil which means to give birth in Greek, that's vitamin E, that the rats would not be able to have any live births.

That's why they called it decofer oil, to give birth because it prevented ... Rats don't have miscarriages. They resorb their fetuses. It causes a fetal reabsorbtion in the absence of proper vitamin E in their diet. That became later a bioassay for testing a vitamin E content of oils was to give it to rats and see how effective it was in preventing fetuses from being resorbed. That became one of the standards for what's called the biological international unit standards of potency for vitamin E.

It was really my work that opened up the mechanistic understanding of how this all operates at the cellular level by looking at actually the role of vitamin E has in cellular membranes in protecting against [lipitor 00:07:43] oxidation and all sorts of other things, probably more detailed than you probably want me to get into but that became my claim to fame early on in the 70s.

Dave: Jeff, you are I'd say considered one of the fathers of functional medicine. It's actually really an honor to even get to interview you so you spent your entire career in this. I'm familiar with your work because of the work I've done with the Silicon Valley Health Institute which is itself 20 years old now and aging research group in

Palo Alto, not super well known but for 20 years, we've had experts come and speak and your work has been referenced.

Functional medicine is a new trendy term, orthomolecular medicine, integrative physician, holistic physician, nutritionist, nutritional ... What is your favorite word for that stuff you do?

Dr. Bland: Thank you. That's a really great question. You've used a word there, orthomolecular. That has a special place in my heart because that was a word coined by Linus Pauling, two time Nobel Prize winning laureate from Palo Alto, originally from Cal Tech and I had the privilege of really having him as my boss for two years in 1981 and '82, I was on sabbatical, I was a research lab director on sabbatical at the Pauling Institute of Science and Medicine.

Orthomolecular was really a term he coined in a landmark article he published in *Science Magazine* in 1968 in which he talked about orthomolecular psychiatry, the use of natural substances that are found in the body to normalize brain and neuronal function. Of course, vitamin C is one he got very famous for but he really talked about the whole milieu of these natural substances in the body which if they're in balance can lead to dismetabolism and create what we call disease. His whole concept was normalize the natural materials in the body by using natural substances and the body will run smoothly. That's what the orthomolecular concept.

The society wrote that molecular medicine was born out of that period of time. In the late 70s, early 80s, a very famous psychiatrist in Berkeley and in San Francisco really formed this group called Molecular Medical Association and I met with him many, many times and one of those key of founding members along with Doctor Pauling was Doctor Abram Hoffer, a scientist in Victoria which you know very well. I had the privilege of spending a lot of time with Abram Hoffer and just think the world of him and his work and what he talked about with niacin and [mellolis and therodoxin, 00:10:21] vitamin B6.

That gave rise to this whole molecular approach to nutrition that all fit together in a very, very interesting side bar to what is considered fruits, nuts and berries in nutrition. In 1989, I got together, actually sponsored a meeting in Victoria. Now, I'm thinking about is interesting. Victoria, British Columbia.

Dave: Yeah, right where I live.

Dr. Bland: Yeah, small world. That's where Abram Hoffer lived as well. I brought in 40 thought leaders that I had been working with for many years that were in

different field. Just sat down with a white board and asked a what if question. What If we could form the best medical technology available, what would it look like? Let's get away from the concerns of reimbursement, peer reinforcement, all the pedigrees and pedagogy. Let's just talk from a theoretical point of view. What would the best medical world look like if we could divine it to be so.

Out of those two years, we met in '89 and '90 in Victoria, came out this concept of assistance biology approach to health care. Rather than organ specific, naming and blaming and thinking we know everything because we can name a disease. It was really asking where do these things come from? What's the mechanism that leads to a specific disorder in an individual so we treat the cause rather than the effect.

As I was trying to think of a word because I didn't think ... All the words that were available like orthomolecular or unconventional or holistic or alternative or complementary, these all have baggage associated with them and would already create distance among people if you just used the words. I was trying to think of something that everyone could rally around as a common word.

I asked, "Okay, let's ask the counterpoint. What would be a kind of medicine that no one, no matter what their discipline is or pedigree, would want to practice?" I said, "Well, no one would want to be want to stand up and be called a dysfunctional practitioner." I said, "Okay, so that means everyone would want to be a functional practitioner."

I used the double entendre the word functional because functional not only implies you're doing something functionally good hopefully but it also implies something that precedes the onset of pathology, which is dysfunction in the body. I chose to resurrect this word because it has been a pejorative word in medicine before that and had been considered psychosomatic medicine or geriatric medicine, rehabilitative medicine but as I'm reading the literature I saw that more and more function is being used in terms of functional cardiology, functional endocrinology, functional radiology. Looking at the effects of early stage changes in the body's function that later states give disease. I said, "Let's call it the Institute for Functional Medicine," we will move this ahead and see how it goes.

It's been very, very interesting since that '89-'90 period. We founded the Institute for Functional Medicine in '91, in December of 2013, we had our 100,000 doctor go through one of our courses. We now have the medical textbook of functional medicine in 17 medical schools. We just certified the first 300 fellows of the Institute for Functional Medicine that have done over 1,000 postgraduate house of study and had to take a very rigorous exam to be certified. I think this thing now

has got a little bit of traction. It's on the knee of the hockey stick. It's a movement that has a worldwide following. I'm very excited about where it's going.

Dave: You certainly done the world a great service with that. I remember back in 1996, I went to the Palo Alto Medical Foundation. Something was wrong. It turns out actually have Lyme Disease. I was experiencing all kinds of problems. I also had exceptional work stress and I was eating the wrong stuff and over-exercising. Basically, if you could mess it up, I was reading it in a magazine and doing it right. I was more advanced than that but I was really clearly unwell.

I didn't know what to call a functional medicine doctor then because they didn't really have them. I went to my normal doctor and I said, "You know, something's wrong but vitamin C seems to make it right and at least it helps." He said, "Stop. vitamin C will kill you." I said, "What about Linus Pauling?" This is in Palo Alto. I looked at him and I said, "You don't know who Linus Pauling is?" He said, "No," and I said, "Nobel Prize, took 90 grams of vitamin C for 20 years," and O said, "By the way, you're fired." I walked out of his office and I didn't see another doctor for several years. I did the work myself.

That's actually part of the story about how I became a biohacker. I own my biology. I'm going to have to manage it, largely using techniques out of a computer hacking, which is my background. There's a lot of techies who cross over into health.

Number one, thanks because now, when a client calls, I can say, "You want a functional medicine doctor or maybe an anti-aging doctor. There's still some of those out there and there's so much cross over," but that's really cool.

How should people talk to their doctor when they go in and they're like, "Actually, I'm not interested in getting a shot or whatever. I would like to stay younger, stronger, I'd like to be more resilient and not get sick this year but I don't want a flu shot." What's the speech you should give to a doctor who's not a functional medicine doctor in order to at least get them on your side?

Dr. Bland: I first thing the word that you chose there is really a key word and that's resilience. The more that we study how organisms, not just humans but all animals survive against the threat of entropy. Entropy is this universal law of thermodynamics that says everything goes to hell in a hand basket free of charge. You don't need to do anything. You have to work up against entropy to keep organized structure intact.

The way that you do that is you improve resiliency. James Freeze at Stanford was really the first guy to seriously talk about resiliency in a medical academe and he talked in this article, *the New England Journal of Medicine*, 1980, called "Aging, Natural Death and the Compression of Morbidity." He talked about the nature of

how animals can improve resiliency on the basis of how they operate in the world. He contrasted zoo animals to animals in the wild showing that animals that were in zoos actually had a shorter longevity than animals that were not killed as animal prey but could live out the limits of their biological life expectancy in the wild, that in the wild they actually lived longer.

You got into how do you maximize the environment in order to produce the most healthy resilience. That was really I think the foundation of how we've trained the docs that are probably the functional medicine system is to think about the systems and that's the seven core physiological processes that really relate to the network of resilience, that people have the ability to resist infection, the ability to resist injury, the ability to repair, to reproduce, to movement, to have energy and direct energy into a functional state rather than just heat lots of the universe. All of those things are really a measure of biologic efficiency which is a measure meant indirectly biological age which is an indirect measurement of how healthy you are. If your biological age is five relative to your chronological age, you're generally not very healthy, your resistance is very low and you're very inefficient. The ability to take energy and process it into directed forms of success.

When we talk about how we address a patient and two so they can be interrogating docs in the right way to get the right answers, the first question that I believe is very important. If you're not trying to get a doc that's just driving for the diagnosis to give you a pill or surgery for that particular disease but you really want to know how do I make this organism call me, work as effectively as possible for as many years, compress illness but the last few seconds of my life and then move on at some terminal age after 100 to the next level of my challenge my energy. If that's your objective, then the question I think as a patient you need to ask the doc is are they interested in your lifestyle? Are they interested in what you eat, how you think, where you live, what you breathe, what you drink? Are your social interactions, are they really doing more than just paying lip service in a three minute conversation about do you smoke and are you overweight but they're really going into the narrative which is your story.

Every patient, every person knows their life story better than a doctor will ever know it. There's no doctor except the doctor who doctors himself that's going to know a patient's life story as well as a patient. The difficulty is we marginalize the value of that story often in medicine. We don't allow the patient to tell their story. We don't allow the person to really get the color, that they understand this intuitive knowledge about what makes them feel good and how they do best in the world. We just drive for what I call the medical teleology which is the diagnosis. We're trying to

get a taxonomic understanding of a complex individual with one word. "Oh, you're a diabetic." Once you're a diabetic, you're a diabetic for the rest of their lives in the minds of that doctor. You're not James Smith or Jill Jones that has a complex life with a complex genealogy. They're just the diabetic patient 47.

I think that the question that a patients or a person should be asking their doc is how interested are you in hearing my narrative and hearing about the life that I live, how I live it, what my family history is, what I think my genetic strengths and weaknesses are like because even those of us who don't have gene tests have some understanding of things that we're resistant to or things that we're sensitive to but it takes a while to get that story out and to listen as a conscious listener.

That this is what docs of old did. If you read some of the original medical literature, you find that the docs didn't have a whole lot in their tool bag of therapeutic medicine but what they did have is really good listening ability and really good, I guess you call it synthetic ability to put together information and create an archetype of what that patient are talking to is really all about and how to manage with some simple tools their complex symptoms. That is a very, very powerful skill. You can learn within five minutes as a patient when your doc is got that skill or not by asking that question. If they say, "No, I'm not that interested," or they just give you lip service and blow it off, you know you're going to have a doc that's really focused most on your disease.

Dave: One of the things I learned over the course of a decade running an anti-aging education group is that often times especially among people who are a little sick who are really trying to figure out what's been going on with me, like they're on a path because something always hurts or they feel tired or whatever it is and they didn't get what they want in their first two things, they get a little bit hostile towards their physician. It's one of the worst things you can do when you go into an appointment and you have a distrustful perspective there.

At the same time, if you're just wholly trusting, you're going to walk out of there like sticking with needles and a bunch of bills and you might not like that outcome either. The ability to receive the feedback and judge it but not necessarily argue every point seems to be a pretty good skill to navigate the company or the physician that your insurance company will actually cover in order to get the things you want, whether it's the right form of thyroid medication or a little bit of bioidentical testosterone, which by the way, you can get from a Western doctor who's not a functional medicine doctor if you know what to say.

Dr. Bland: It's exactly right. Actually has become easier under the Affordable Health Care Act. I think a lot of people are very antagonistic to this new health care

law, feeling that it's just really changed the whole playing field and made it confusing. I think we have to look at it from a slightly perspective. It actually is opening up the opportunity for destructive innovation and restructive technology, it's creating the headspace that we need to actually ask the right kind of questions. Before, you couldn't even ask the questions because they were already nullified before we even asked them. The system was so regimented and a multi-headed hybrid that we called the health care kind of industrial complex was really not at all, I guess even susceptible or sensitive or compassionate about asking different questions concerning your issues and health care.

The Affordable Health Care Act to me has opened up the chance it is actually reimbursing for prevention although they're fairly primitive but as services at this point, at least we have some head space. At least we have some room. We got our foot in the door. There's a glimmer of light coming through.

The law of the land that we're operating under now we know is going to change over the next few years. It will broaden, it will take into account this new quantified human movement. It will encourage much more understanding, using wearable devices. It will use biometrics. It will help personalize medicine so it's not medicine for the average, it's medicine for the individual.

These are all things that are going to happen but in order for that to happen, we have to have a quiet revolution and that is the Affordable Health Care Act. It is going to create that disruption that will allow this kind of voice and language to occur.

My thought is when people are very negative and saying, "Oh, nothing ever changes, it's life gets more complicated, regulations just get more confusing," they need to look somewhat at the other side saying, "The only way we're going to create a change in this very complex system which makes the military industrial complex look childlike in comparison is to have a disruptive revolution," an evolving evolution. That's really what is occurring right now in health care. I think that it's driven by groups like yours. Quite honestly, these resist authority, take charge of their health, this is my body, I own it and I want the information, I'm going to get what I need type of vigilance which will create this space for many others that will follow.

Dave: It's got to feel pretty good. You wrote a book called *The Disease Delusion* and you've outlined all sorts of physiological processes here but largely, your career from Western biochemical perspective has been very functional structure and you brought in some of the systems thinking.

When you get things like 23 and me genetic data results and you're seeing that now from more than just a couple people who had a \$100,000 to do it. You're getting people who come in and say, "Here's my heart rate all day, every day for the past X number of days," does that change the way you think about the practice of medicine? What's your take on where that's going, I guess is the question I'm really asking there?

Dr. Bland: Obviously, I can turn that question around to you because I think you probably are more informed than I am, but my thought as I'm putting my finger on the pulse of this is this is the wild card. This is the change agent. This is the currency that we need. This is the lightning. This is the light in the box, whatever you want to call it that is going to really move us from statistical humans which is what we studied in medical school, this 60-70 kilogram mythical statistical human to medicine and the individual. They health care for the individual.

As Roger Williams said in 1974 when I was at a founding meeting of the American Society of Preventive Medicine, he said something. He, by the way, was the father of pantothenic acid and discovered a number of other important nutrients. He was also the developer of the concept called the Genetotropic theory of disease and biochemical individuality, wrote books and articles on that in *Lancet* and the *JAMA*.

He said, "Nutrition is for real people. Statistical humans are of little interest." In such a simple statement, he captured such a tremendous body of information because we have generations of people that have been studying statistical humans. Even studies that we do, these double blind randomized placebo controlled trials, as we probably know, regress to the meme. They're built around statistical average.

The outliers, who are the people on the edge of the curb which is basically every one of us for some principles an outlier. There's not a single person that for some nomogram in some value of some anolyte in their body's not an outlier but we are driven into the regression of the meme, thinking everybody is somehow within two standard units of deviations from the meme and should be treated like everybody else.

We didn't even gender specify in medicine as you probably know until Bernadine Healy became the director of the National Institute of Health, we had our first woman director who then mandated studies to be stratified for females, we didn't even have good data on women. It was all mixed together as a polyglot.

I think that what this is doing right now is it is the transformation agent that is really producing the medicine that we need for the individual because we're not

going to be able to solve the issues of individuals by applying a medicine for the average.

Let me use a good example. I'll get off my soap box on that and that's statins. Statins are a really interesting example because they became so prevalent in thinking that there was actual serious consideration of putting them in the water system like we put fluoride for kids because kids were showing such increasing levels of cholesterol in their blood that it was, "Okay, this could be a public health approach towards reducing cardiovascular disease because these drugs are both so safe." What's happening, as you well know is it over the years of their administration, they degree of adverse side effects that are occurring in patients taken statins are going up. In fact, I think nearly 50% of patients that take statins have some kind of low grade average effects, there are muscular effects, cramping, pain. I'm not even talking about the more serious effects, the [random myofibrillar myopathy that relates to complete degradation of muscle fibers but these are just very nagging symptoms. Sometimes things that appear like exercise intolerance and I've seen this in so many statin-taking individuals.

Now people are saying, "Well, hold up. Maybe they're not as safe as we thought them to be." Now why is that? The reason it happens is that over the course of time, when people are exposed to foreign molecules that their body are not used to, eventually they start developing antibodies to those molecules because they are foreigners. They also start having effects that are on secondary and tertiary levels set off target effects. Then they have been very mild in the short term but they've become cumulative over long term and they start to add up. You start to see things that appear. We saw that with the drug Vioxx that looked like a great pain killer and anti-inflammatory but over time, we started seeing people then having these cardiovascular events with specific types of genetic uniquenesses.

These constructs that we're going to treat people with blockbuster drugs, everyone gets one class at some particular dose schedule is just ludicrous. It's totally in opposition from what we learned over the last 25 years about pharmacogenetics and uniqueness of individuals. Therefore, I think what you just stated, this concept that we are seeing people accumulate information get access to data they never had, just only two weeks ago, the F.D.A. has now ... No, excuse me. It was the high court has now validated that patients that have complete access to their medical records including all the laboratory values.

Now, thinking 15 years ago, as a patients, unless you were a medical doctor, you had no access to your laboratory data. Whatever your doctor wanted to tell you was all you really got. They didn't give you access to that information.

Now, this freedom of information is going to require us all to step up and be more responsible and to be engaged in the most important thing that we own in our lives which is our genome and our body and do something about it. That to me is exciting.

Dave: Does it bother you that I'm an unlicensed biohacker, in that I have zero credentials for what I do yet probably 7,000,000 downloads of the podcast about now and millions of people see the things I write which I link to references and all that stuff. There's an entire possibility that I could be wrong. Of course, all research has that link but some of the things I recommend aren't necessarily mainstream. A lot of them come out of anti-aging fields but there's always been a very high bar for medical professionals. I'm not one. I'm never going to be one but I'm damn good at looking at systems and data.

Some of these people will want to give people like me access to all of their quantified self data and blood values for inflammation and lipids and whatever else and say, "You know what? Could you crank it through your mechanistic algorithm or through your brain, I don't care, but tell me where I can look for more clues. Tell me the other data I'm missing." What if the person who does that is not a medical professional? Is that scary to you or is that a liberating thing?

Dr. Bland: I think first, you have to ask the question, what does a credential in a medical professional mean? These are words, right? These are language systems that tries a certain preconceptions as to what it is requiring to be sentient or to be knowledgeable or to be authentic or to be truthful or to be an authority. There are many people that are credentialed that are not authorities although they might think they are and pontificate on things they have little or no knowledge about and are really giving truthful facts when their level of knowledge is so superficial, you could wipe it out with a dust cloth.

I think that we have to be very cautious how we use language and what is authenticity? I think with the Malcolm Gladwell concept of what is an expert? It's 10,000 hours. If you spend the time to dig deep, if you're smart and you're a person that is a seeker. This is what I always look for when I'm hiring people is I don't ... I like to run by the resume but the most important thing is how deeply do they search, how vigilant are they? How ambitious are there to find truth and how much are they willing to call themselves wrong when they could find better answers? Those are the, to me, the examples of authenticity as it relates to professionalism.

There is a certain skill set, a certain set of, I guess you call it anti in any profession that you have to have to be called a professional but you don't necessarily have to go to a formal school and sit down in a classroom and go

through a recitation to be that because there are many people who go through that and they're never professional.

I think we have to re-evaluate words in this new age that we live. The internet age is an age of accessed information that we've never had before. It's democratizing information, rather than command and control which is a militaristic top down type of information system that we've had historically, this is a democratization of the information system which I think has huge value but it also, like anything has huge risk. It has to be managed in both ways.

Dave: I'm looking forward to a world where I can take the sum total of my [Q.S. 00:34:08] data, my lab data and whatever other stuff I've got and I can give it to three different experts who are all well rated by a group of people with bodies like mine, let's say. I can get all of them to crunch my data or talk to me, whatever, like there's a line of encroaching data and being a care provider and they're different things. I want to get an answer back from each of them, compare them, look for commonalities and go, "All right. I think that's really good. This one's an outlier. Why are they an outlier? They're not or they know something the other guys don't and their algorithms better."

In my mind, this isn't the future of medicine but it's the future of discovery of what's wrong and medicine is what is the art of restoring the balance, restoring resilience and all. There, the care provider matters. I work with a team of different people, different physicians who know different things. I don't self-treat but I certainly self-manage aggressively I think it's fair to say but that vision I think because of the internet, because of the cloud is where we're going. I hope more physicians embrace it because someone who's been through that has had their data looked at from at least one good algorithm like that and comes into your office Is just going to be better prepared. You'll have the data, too. Then you can really team and you can maybe do something in the eight minutes you get with ...

Dr. Bland: I think you said it very beautifully. It actually gave us a whole rationale for me. I'm writing this book, *The Disease Delusion*. I felt that I owed it to myself and hopefully to the readers as well to sit down and compile 35 years of this journey that I've been on, 6,000,000 miles and literally thousands of thought leaders that I've had the fortune and privilege to talk to. I've been a pretty good mosaic of picking up these ideas from a lot of these individuals and trying to put them together into a system that has some structure. I just felt that it was time to really sit down and try to put that process of thinking together into a formalization that made it accessible to I guess health seekers.

My book is certainly not a book that's like a primer book for every person who wants a pill for an ill but it is a book that does describe the intellectual development of this field and gives the insight as to how one can harness this extraordinary technology that we have seen emerge over the last 20 years. It's a revolution comparable only to the revolution and knowledge it occurred at the turn of the last century with the invention of the or the discovery of the infectious disease model where bacteria and viruses were found to produce disease and under this huge advance in human health that occurred In the early 20th century. We're seeing the same type of thing happen now as it relates to this [omex 00:36:51] revolution where omex interfaces with lifestyle and behavior patterns in the environment. That's where the next major breakthrough's going to occur.

Dave: In your book ... By the way, I recommend to anyone who listens to this show regularly and likes to think about managing themselves, managing their biohacking abilities, ought to take a look at your book because what you've done over 35 years really does come through because there's an incredible mishmash of information out there and it's so complex that learning how to organize and categorize it so it's absorbable by people who spend 10 or 100,000 hours doing it, the bar is so high and this is something I've struggled, I've read hundreds and hundreds of books to get to the level of knowledge that I have but you've got seven core physiological processes that you outline. Every one of those is somewhere where you can fall off that wagon where either you're in a state of resilience and you feel good all the time and you can walk around kicking ass all the time or like your day sucks and you don't know why. I find your list to be stellar and spot on and you're not missing anything. I couldn't find fault with it.

Would you run through this seven things that our bodies must do right for you to feel good all the time?

Dr. Bland: Yeah. Thanks. One might ask why is it seven? It sounds a lot like where the seven steps to success or something, I don't know. "What's with seven?"

Dave: Steven Covey did it.

Dr. Bland: Yeah, exactly. The reason that those seven came out was when we did these whiteboard meetings in Victoria back in '89 and '90, we were sifting the literature the best we could among this group of multidisciplinary experts and trying to put into files or buckets where this literature netted it out. As we got into further discussions and we're fortifying this buckets where you can take these different studies that were being published on all sorts of diseases and asked what's the fundamental nexus of the study about and let's not talk about what you call the

disease. Let's call what they're studying. It turned out that they fell into one or more of these seven piles which we call the core physiological processes.

I'm not saying that these are etched in stone and these came down on tablets. All I'm saying is that they appear to cover the waterfront, to differentiate the different functions that a human being has that control their phenotype, the phenotype is how we look, act, feel and perform over the course of living.

The seven include things like digestion, elimination which is one and we framed that what we could often call the gastrointestinal system in a different, we would call it a more modern way because we recognize that 50% of the body's immune system is clustered around the intestines. It wasn't just for cosmetic reasons. It wasn't that the universal designer said, "I don't have any place to put the immune systems. I'll just stick it on the intestines." They're stuck there, because if you think of it during the course of living, we eat about 20 tons on average of foreign molecules unless we're a cannibal. Our body has to understand how to translate those foreign molecules into friendly messages to our bodies.

The immune system that's clustered around our intestines is really the translator of our foreign molecules in our food into a favorable messages for our body. That can also go the other way because It can be the translator of foreign molecules of our food into an alarm message in our body which then produces inflammation. That's why gluten can produce dementia. The effect of gluten in the gut can be translated through signaling all the way up to the brain to the neuroglial cells which are the brain's immune system is clustered there.

We recognize that the digestion elimination system is much more than just a digestive conduit like a piece of plumbing. It's an accurate sampler of our universe and sampling the outside and translating it to the inside. That's how we approach that.

The next one would be our body's detoxification system. I find it very interesting how many people in medicine will still somehow resist this concept of detoxification. I just don't understand why this is because we know that if we didn't have this highly evolved complex detoxification system that we're exposed to so many foreign substances both coming from outside and inside our bodies that we wouldn't last but a couple of years as an animal. We have to have a detoxification system.

Then, the question that's been raised is, "Okay, we have a detoxification system that only works on drugs." No, it works on all sorts of things. Any molecule goes through these same Cytochrome P450s and phase two conjugations and so forth.

That is in very interesting system because it shows such genetic variation from person to person. In fact, these, the Cytochrome P450 Phase one detoxification system in our liver shows more biologic variability than virtually any other system in our body. In fact, from one person to another, a specific activity of a detox [bioenzyme 00:41:58] may vary by a factor of 10 to the third, a thousand. That means if you expose someone to a dose of something and they have a fast detoxifying system, they have no effect at all, that same dose at the same level to another person who has a slower detoxifying viability may kill them.

There's this very wide variation in detoxify ability from person to person. This is given birth in medicine to the field called pharmacogenetics, which we now recognize, you can't give certain drugs to certain people based upon their genetic ability to metabolize because they just don't do well on certain drugs.

We also recognize that diet and lifestyle plays a role in how our detoxifying system works because many of these enzymes are inducible. The genes are upregulated upon stimulation by specific nutrients, particularly certain phytochemicals like cruciferous vegetables.

Dave: This is one of those easy to hack systems where, "Oh, I'm not detoxing well enough for maybe I just swim in pollutants all the time because of my job. Maybe I could help my body out a little bit there." Like you said, for some reason, this seems to be not well covered in modern medicine. Is there are reason that this is number two on your list, that it's not thought of in medicine?

Dr. Bland: My belief is and I don't know that this fact but my belief and we were one of the first groups I'm very proud to say in really looking at the nutrient impact upon detoxification from a biochemical perspective. We published our first papers on this in the early 80s when I was at the Pauling Institute. I believe that medicine resist this because they think that these detoxification systems somehow only apply to foreign molecules meaning drugs.

Dave: That's why. It's just a bias towards drugs. Okay.

Dr. Bland: I think it really is. They will accept at least the more enlightened doctor will accept the fact that there are these variations in pharmacogenetic detoxifying systems for drugs like SSRIs and with polymorphisms, if Cytochrome P450 2D6 so we don't give certain drugs to those people and have that genetic variation but where they're getting into I think more confusion is that the endogenous substances that produce by our gut bacteria that are absorbed every day from the metabolism of our microbiome, those things have to be detoxified by the same systems that are detoxifying drugs.

If we can't detoxify drugs, then we might have problem detoxifying these other things, too, which produces a condition in medicine that's called a panic encephalopathy. The name suggests the liver, the tympanic region is connected to the brain, encephalopathic. However, it really should be called gastrointestinal tympanic encephalopathy because the toxins that are produced in our gut are not detoxified by the liver and up in the brain and what happens in the people in the hospitals, they hallucinate and they become psychotic.

You see this in older age people often and there's treatment for that, what do they treat? They treat the gut with drug called Lactulose. It causes diarrhea and gets rid of the toxic bacteria.

When you start bringing these things up to doctor because they often don't think about all these associations. They're so busy just filling out forms and keeping out of medical insurance liability issues and trying to deal with patients as best they can, they don't have the time to sit down, read the literature, thoughtfully consider all these things put together. These are bright people. I don't want to sound dismissive at all. They're dedicated people but they can only handle so much so I think that often they don't have the bandwidth, the space to really think about all these other connections.

Dave: It's not commonly taught in school. You got five more in you. You've got defense as another area of physiological process. This is obviously the immune system and though it's the short version of how you think about defense in these processes for staying resilient?

Dr. Bland: Yeah, I think the defense, the way that we think of that is that as with any defensive system, it can be your best friend, it can be your best enemy because if there's nothing to defend against. The defense system wants to be active, it might start just attacking the things around it. That's called the innocent bystander activities. That's inflammatory diseases, that's auto immune disease, that's allergy. That's arteriosclerotic, arterial inflammation, that's neuropathy.

The immune system's gone over active because it's trying to do battle against a feigned enemy that doesn't really exist is a big potential problem. Then, you start saying, "How do you cool off the immune system?" If it's the god of war Mars, that's the color red, [rubocolorandor, 00:46:39] how do you make Mars into the goddess of love, [Angea 00:46:45] and cool that off so red goes to green.

The answer is there are many ways that we can do that by both removing the offender that's triggering the god of war Mars into being red. That means system being overly active. There's other things that you then give that are agents that tend to normalize the immune system, a variety of phytochemicals, ginger, [osteride

00:47:12] polyphones, so various substances that will be very useful in normalizing effects. It's finding the right balance to normalize the immune system.

The next one of course is what we call cellular communications. It relates to the molecules that transmit information from one place of the body to another like we can think of hormones like the steroid hormones are obviously the most widely thought of but we can also think of prostanoids, [dichostanoids, we can think of leukotrienes, 00:47:37] we can think of cytokines. We can think of all sorts of messenger molecules that are transmission agents for taking messages from one place of the body and communicating it somewhere else, one of the families that has been recently discovered are the messenger molecules coming out of our fat. When we have angry fat, we call these a [diploctikines. 00:48:00] These fat molecules can trigger problems in the heart, they can trigger problems in the brain, they can trigger problems in the pancreas, causing beta cells to die and losing insulin secreting ability.

How do you normalize the messaging of your body? These hormones and these messenger molecules and that's another major part of the book that we talk about.

Then the next is the cellular transport. How do you get things that you need from one place to another? For instance, you need fat to go from the liver to a cell so it can be used for energy. It's transported on the back of what are called lipoproteins. We call the LDL, the LDLs, HDLs, IDLs. How do you produce the right family of those transport proteins so it doesn't block up the system and glob up the arteries and create coronary vascular disease?

The other is how do you transport glucose which is the principal fuel? It's a form of sugar that needs to be in every cell that is doing metabolism but it needs to be in the right dose, at the right level, at the right time. Not too much, not too little. How do you transport glucose effectively? That leads to the concepts of insulin signaling and slow resistance, metabolic syndrome, type two diabetes and all those conditions. We have a whole discussion about that.

Another of the seven core physiological processes has to do with structure. We think of this skeleton as something that is in the anatomy lab of some school in which it's dead and it's just this calcified matrix of these bones but if we really look at this skeleton, it is an extraordinarily important active part of our body. It turns over every seven years. It has a marrow which produces every white and blood red blood cell in our body. It's a major part of our immune system. It produces hormones. It regulates the communication with the gut and communicate with our pancreas to regulate insulin.

Our structure is our function. Our function is our structure. People that don't have proper structure don't have proper functions so that leads to physical medicine, that leads to acupuncture, that leads to chiropractic osteopathy, it leads to energy medicine. All sort of interesting things.

Dave: Hold on a second. You're a biochemist who would look into energy medicine, chiropractic homeopathy? Just confirming that you said that.

Dr. Bland: Absolutely. They're all part of the materialistic view of how you translate intention into function.

Dave: Damn straight. All right. Thanks for saying that. People need to hear that. Every now and then, I get these hard core uber-rationalist people who say, "It can't work because it doesn't work the way I want it to work." My god, sometimes things work and we can see that they work and we don't know why. That should raise question marks and not fear but anyway, I appreciate you stepping up and saying that because you've got the credentials to say, "There's probably something there.:" That's been my experience as well.

Dr. Bland: Yeah. I think we have to thank you, Dave, for saying that because I think we need to go back and say where does mass comes from. Mass comes from energy. We know this Einsteinian mass equivalency equals MC^2 . If you think of quantitized, materialized matter, matter is just a form of coalesced energy.

What are molecules, molecules are energy that's been coalesced into high energy content. Think about what I just said here. A molecule glucose which has six carbon atoms and a bunch of hydrogens and oxygens stuck onto it in a specific topological configuration, a specific stereochemical structure. That is really, if you think about it, materialized energy has a very high information content. It's going to impart potential information to a complex cellular system to create the potential of energy and how it does that is through this metabolic process that we call secondary metabolism but if you slightly alter this structure of that molecule, you can have the same carbon atoms, same hydrogen, same oxygens but if they're in a different molecular configuration, information changes in that molecule and now it imparts a whole different energy portfolio on the body.

I think that this construct of structure function which I learned by the way from doctor Pauling, that was his whole thesis going back to 1930s when he started his work was structure determines function, function determines structure, it's a holograph. That is life. Matter and energy interconvert.

When we talk about, "Well, that conversation that Jeff and Dave had was just a bunch of words traveling back and forth, it just moved air and it produced the sound waves. Maybe it was physioelectrically converted to electricity so it got into a video

form. No, it did more than that. It actually quantitized information in a way that structure that can be accessible is taking from random noise of the universe. That is a powerful concept that ultimately can be materialized because what we are talking about, someone can make into a material form. It's a very, very interesting duality, it's not really a duality. My mind-body energy matrix.

Dave: There's some things we haven't figured out all the way yet and certainly information field theory is one of them and understanding how do we account for the transfer of information that isn't just done via a molecule or an electron.

Speaking of molecules and electrons, the last thing out of seven on your list is energy, which is an area where I've spent a lot of time. I actually have a new supplement that's coming out that's targeting mitochondria, it's called *Unfair Advantage*. I've been in my own life radically rejuvenated by focusing on mitochondrial function, especially when I was just feeling really tired and low and I was getting brain dysfunction because brain is full of mitochondria. If you're listening and you're new to the show, mitochondria are the power plants to the cell that make ATP which is the fuel of your body. As the last and final one of your seven core physiological processes, what is the deal with energy?

Dr. Bland: Thanks. That's a great place for us to end this discussion because it is the beginning of the end and it's the end of the beginning. It is all, right? With no energy, you have no ability to maintain structure against the randomization of the universe. You have no ability to reproduce to contract muscles to do anything.

Where does that process all derive from? It derives from taking high energy molecules from nature that are really derived from the sun where the sun's energy is captured by chlorophyll, into manufacturing of the components of plants which are called carbohydrates, fat and proteins. Then, taking that high potential energy and converting it through this complex process of metabolism into directed, high information content energy that allows our body to be powered.

It does so through as you mention, this extraordinarily interesting organelle that appears in cells that I call a quantum mechanical transducer called the mitochondria because if you really think of what the mitochondria does, we can go into all the biochemistry I won't beg on people's indulgence to do that but what it does is it strips electrons off food and it allows those electrons to be directed like you do when electrons are generated from a hydroelectric dam when water goes through the turbines. When water goes through the turbines in our state of Washington, we have the Columbia River. I derive right now light out of my light bulb here that's coming from electrons generated in the Columbia River by water going through a river. How did it happen? How did some 170 miles removed from

that turban did those electrons impart that energy that lights up this light bulb. They did so through the process of transmission of energy like electron transport chain does in the mitochondria. It's a miniature example of this hydroelectric power or nuclear generating power system.

It does so by basically taking high energy nutrients, macronutrients, protein, carbohydrate and fat and processing them through this extraordinary little energy powerhouse called the mitochondria to then produce these high energy intermediates that are directed. You named the most principally important ATP but there's also NADPH, NFAT and FATH2. These particular high energy intermediates then are delivered to regions of the cells that are necessary for muscles to contract or neurons to fire or digestive juices to be released or sales to replicate or on and on and on.

How do we control that? I think the most interesting numerative elements in this field of mitochondrial bioenergetics is the recognition that diet and lifestyle play extraordinarily important roles in functionally maintaining the integrity of the ability's little powerhouses to do their work.

In the past, we thought this was a genetic legacy. We either got good mitochondria or we didn't. By the way, our mitochondria come exclusively from our mothers. We are more biologically genetically our mothers than our fathers. It's not 50/50. We have a small amount of mitochondria D.N.A. that came strictly from the egg, from our mothers because the mitochondria and the sperm fell off with the tail. Therefore, this biological energy that we got from our mothers in the form of our mitochondria is the energy powerhouse that needs to be maintained and regulated. It's fine layer of membranes in the mitochondria are very rich in these omega-3 fatty acids like DHA and EPA particularly DHA.

We have to have proper nutrition of fatty acids. We have to have proper regulation of intermediaries like coenzyme Q10 which is very important substance. It helps to protect the mitochondrial energy transport system against internal injury. We need magnesium in very significant levels for ... I could go on and on. There are many, many ... It's a treasure trove. All the vitamins are present there, the minerals, iron, zinc, copper found in the mitochondria.

It is really a lesson plan unto itself as to how to maintain cellular structure and function by maintenance of mitochondria function. I'm very proud to say that we I believe are the first group to actually start doing discussions within the medical community on functional mitochondria physiology. I started my lectures in the early 80s on oxidants, antioxidants and mitochondrial function. As I look back now, I didn't realize at the time but it was pretty prescient. We were ahead of the power

curve. People like you have really taken this to the next level and really understanding how to maximize mitochondrial function.

Dave: All seven of those levels that you described. Each is eminently hackable. When I say hackable, doesn't mean you have to go take a drug. You have to go for a doctor, though you might for some of these because you want lab tests. What you can do is you can look at what you do to the environment around you or the environment in your body, what changes there are likely to create the changes you want, try those changes, see if you got the results you expected. If you did and you like them, maybe you should do that more. That would be the essence of biohacking.

Dr. Bland: It's beautifully stated exactly what I'm trying to do in *The Disease Delusion*. I have eight questionnaires in there that are basically designed, the questionnaires we've used in our research place over the last 25 years that are designed to help the person understand whether they fit or don't fit and each of these seven core categories. In other words, am I a candidate for an imbalance in this category where I should focus my attention? That's the structure I've tried to put into my book to make it a little bit more user friendly.

Dave: The book again is called *The Disease Delusion* and we'll link to in this show notes.

Now, we're coming up on the end of the show, Jeff. There's one question that I ask every guest. The question is given your entire life, not just your professional life but everything that you've learned, what are the three biggest pieces of advice you have for someone who wanted to perform better at life, not just whatever, in sport or something like that but if you want to kick ass or whatever it is you're here to do, what is the big three learning's you've got to offer.

Dr. Bland: I think number one, it supersedes the other two by probably an order of magnitude is exemplified by you. That is a locus of control, take charge. If you have any resonant holdover that you're a victim, you're dead in the water before you even get going. Any person that thinks they're a victim is always working a tank half empty. You have to think of yourself as a winner, you have to think of yourself as being in charge and you have to have a high locus of control. You have to be involved with self-efficacy. You're the most important person in your universe and you're taking charge of that person. That's number one.

In the absence of that, my other two aren't really important. If you got that one then the next two are seek out the appropriate guides, mentors and knowledge bearers. No one knows everything. No one person provides complete omniscience but keep your eyes and your ears open, listen, talk and be a seeker. I think in so doing and don't lock in too quickly to feeling like you have the answers. Remain

some degree of neural plasticity so you're always open to a new idea that might actually be a requirement of an old idea. I think that that particularly in this time of great, great cultural and intellectual transformation we're going through, it's a very good second principle.

The third is do it, right? That sounds like I've just stole something from a very famous line of a successful Fortune 500 company but all of this, if it's not applied to action doesn't do anybody any good. It's very easy to be too busy to take care of yourself. They say activity is like a gas filling its own volume. There'll always be an activity that'll fill your time. "I'm too busy for this. I'm too busy for that."

I'll say a quick antidote. This goes back over 30 years ago. I was giving one of my first lectures to physicians and I was talking about exercise. I said, "So, let's look at how long it takes to get some effective aerobic exercise in. I was saying 20 minutes of sustaining your pulse every day within your aerobic training zone based on your age and fitness level is a good target. Someone said, "Oh! Twenty minutes, well jeez but I have to get dressed and I have to take a shower and I have to get redressed and my word, it may take upward of an hour total."

I said, "Okay, so let's say it does take an hour. I don't think it would take an hour but let's say it does take an hour. That's 1/24th of your day. That's five percent of your day. Okay, 1/24th, five percent. Are you worth five percent of your day because if you are, this is a life insurance policy you're investing in."

Now, the thing you think you're investing in that you call life insurance policy is a death insurance policy. It's going to pay your beneficiaries for your death. If you want a life insurance policy, you want to have at least five percent of your day as a life insurance for your longevity. That's the dedication you have to make every day.

Now, when I said that, that was 30 years ago. I ran into one of those docs at that meeting recently. He said to me 37 years later, the most profound thing at any medical meeting he ever went to in his 30 year history was that one statement, that if he doesn't have five percent of his day for himself, than what value is he to himself? I think that, "Just do it," is a very, very important third principle that we all have to implement.

Dave: Sage advice.

Doctor Jeffrey Bland, thank you very much for being on this show and thanks for the 35 years you've put into hacking the human body. It's moved mountains.

Dr. Bland: Dave, thank you. I think what you're doing to spread this news and bring it into a music and be used is absolutely work out. Thanks a million.

Dave: Would you do me the favor of listing where people can buy your book or any URLs you'd like to send them to. All these are in the show notes but a lot of people

are driving right now so they'd love to know where they can learn more about your work.

Dr. Bland: The book is available on Amazon or all major book sellers. It was released in April of 2014. It's really available.

I can be found at jeffreybland.com or you can find me. All you have to do is Google Jeffrey Bland and you'll hear all the things you never wanted to know about me somehow. That's where I can be found.

Dave: Thanks. Have a great afternoon.

Not that many people know it but the first company I started was a T-shirt company when I was about 20. It turns out that company was the first company to sell anything over the internet. The very first working example of e-commerce. It was featured in lots and lots of magazines in the early to mid 90s because it was such an innovation.

I'm back in the T-shirt business. Head on over to upgradedself.com and see how cool these T-shirts are. They fit amazingly well. They're super soft and they're really affordable, especially for a T-shirt that's this high quality.

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