

Lou Reese: We're talking hundreds of thousands of dollars a year per patient or millions of dollars a year for a patient, and if we look at certain CAR T therapies, we're talking over \$1 million a year for single treatment, and it's a single treatment solution. These are extremely expensive solutions and they offer unbelievable benefit to people and I love that that suffering has been eliminated. I commend the scientists that have made all those amazing breakthroughs. My goal is for every single person on the planet to be able to afford this. My goal is for every single government on the planet to be able to afford this. That's what I mean by democratizing health. Every single person should have access to the best health.

Announcer: Bulletproof Radio. A state of high performance.

Dave Asprey: You're listening to Bulletproof Radio with Dave Asprey. Today's cool fact of the day is that fidgeting affects brain activity. The seemingly useless motion of fidgeting has profound and widespread effects on a mouse's brain activity, at least according to neuroscientists at Cold Spring Harbor Laboratory in New York. They recently reported this in their findings in *Nature Neuroscience*. The researchers use several different methods to eavesdrop on nerve cell behavior in animals brains as the mice completed normal mouse-like tasks. Video cameras and a sensor embedded on a platform under the mice picked up every move the rodents made and there were a lot. That pretty much means that they're almost like on a social media network where they pick up every move that you make.

Dave Asprey: Now the mice would wiggle their noses, they would flick their fingers and fiddle their hind paws while concentrating on finding the sound or light and those fidget showed up in their nerve cell activity. The fidgets predicted a big chunk of neural behavior and even had stronger effects on brain activity than did the task they were actually doing according to the research. One possibility from this is that body motion and it's big effect on brain activity is actually part of the thinking process. So the next time your kids are fidgeting, you can just say, "Hey, thanks for fidgeting, I know it's actually making your brain work better and that's pretty awesome."

Dave Asprey: This is a special edition recorded live at the XPRIZE Visioneering Summit. This is where a group of people get together every year and we figure out what the next things to improve the world are going to be. We're talking about things like the privatization of space, the first XPRIZE was around the first group of any type who could send a ship to the edge of space and back down and then back up again two weeks later, was going to get \$10 million. That kicked off this whole effort is now a 25-year-old nonprofit group that is solving global problems.

Dave Asprey: Last year, I helped to fund the carbon capture XPRIZE, this year, I'm pitching an XPRIZE around actually hacking stress and how we're going to be able to measure stress of all humans on Earth so we can see whether what we're doing to our environment is working or not working. Who knows if that will get funded, but this is one of the most fun things they ever get to do. The interview

today is going to be profoundly interesting because it is with my friend Lou Reese, who is founder and something O of United Neuroscience.

Dave Asprey: Lou is working on actively hacking our immune response to all sorts of things that you wouldn't think about. This is one of those three days every year when I get super excited. Thanks to Peter Diamandis who's been on the show lots of times and Naveen Jain has been on the show, who's a trustee. Joe Polish is involved in this as well, a former guest on the show. This is a group that's changing the world the most smart, interesting, forward thinking, disruptive individuals, and Lou is one of those. What Lou's doing is hacking our immune system so they'll do what we want. Lou, welcome to the show.

Lou Reese: Thank you so much for having me, Dave. It's awesome to be here. It's really an honor and it's great to be with you.

Dave Asprey: You're wearing some kind of funky, lightly tinted glasses. What's up with those?

Lou Reese: You know, these are the Hugo Rodney-Jane Goodall collaboration glasses. They're entirely plant-based and you can throw them into the ocean and they biodegrade. It's one little thing that we can do to avoid junking up our world.

Dave Asprey: You're just wanting to look cool.

Lou Reese: Well, there's prescription. I have to see.

Dave Asprey: They're prescription, too? You get a little tint on it. I was wondering, are you one of those urban lens guys?

Lou Reese: No, no, no. They block out the majority of UV light so it's good for your eyes but more importantly, you know, I can see.

Dave Asprey: All right. Got it. That whole prescription thing. I thought I would just hack my eyes and I went from 20-60 down to 20-15 just by training my eyes. You know, if you want to rely on prosthetics and be like part cyborg because you now have a piece of mechanical hardware in front of your eyes, that's cool. I like cyborgs, man.

Lou Reese: You know, I'm doing my best here but I think that I'm going to have to talk to you about training those eyes because that sounds significantly better than relying on these glasses.

Dave Asprey: I'm just giving you crap. But I did go from 20 ... I had LASIK in 1997. Then that was from 20-15. Then over the course of 5, 10 years, it drifted until I was 20-60 and I developed astigmatism. Then in three months of training, I got back to 20-15. Years later, with all the stuff I do, I'm still 20-15 with full flexibility. I can read the finest print that teen years can read, it's crazy. That wasn't supposed to be possible. So hacking your eyes is more what we're going to talk about, but I just

... You have this cool look, you look like a surfer and you're in these funky glasses and these have to be some kind of a cool bio hacker thing. But they are because you're actually saying we got something that's going to dissolve when we're done with them instead of clogging up the ocean.

Lou Reese: Yeah. That's the idea. It's a world hack, not a bio hack on this.

Dave Asprey: We'll have to talk to you and see if I can get some of that tech into the glasses I'm wearing, one of the other companies I started. But that's not our topic. Immune systems. All right. Give me your story, man. How did you get to be where you are? Why do you care so much about this and why the heck are you qualified to hack some immune systems?

Lou Reese: You know, I'm probably not qualified but our team is and I believe that the team and the science behind what we're doing is really solid. I think we've been developing it for 30 plus years and it's really compelling. How we got here is impact. What's the largest impact that you can have? I feel like the largest impact that we can have is on addressing the largest issue facing mortality in the world, which for the first time ever last year, ceased to be the enemy that's outside of us. It ceased to be bacterial infections and genocide and starvation and mass migration of people. It stopped being those things and instead became ourselves. It became chronic illness, that's the number one killer.

Lou Reese: That was the first time in history, in the existence of mankind, that what killed us was things that our body made inside rather than things that were harmful coming outside. The exogenous is no longer the primary enemy, the endogenous is the primary enemy. Seeing that transition is really important, I think. The question then was, "What can we do to alleviate suffering and alleviate, ultimately, elements or entirely chronic illness?" We targeted some of the largest and most impactful diseases in the world right now, including Alzheimer's, which is the sixth leading cause of death. The only one in the top 10 that's increasing, which is shocking, Parkinson's where we have a vaccine or a long acting biologic.

Dave Asprey: So the V word.

Lou Reese: Yeah, the V word.

Dave Asprey: Darth Vader.

Lou Reese: It's fascinating. That trial's happening in man right now. We've got a PCS canine drug that is going to potentially eradicate cholesterol problems. These are major innovations that I think can really do a part in eliminating suffering and increasing health span.

Dave Asprey: You said two things that are really fascinating. The first one, you said a vaccine for Parkinson's. What do you mean when you say vaccine?

Lou Reese: It's really a long acting biologic and I'll explain a little bit of the mechanism in terms that I understand. You know, there are people that are over 100 that perform exceptionally well, both physically and mentally. My grandfather was one of it, he died at 102. He was doing the New York Times crossword puzzle in pen until he died. He was unbelievably active physically in all sorts of ways until he died. The idea really was that what makes those people special, what makes them stand out and how can we see those areas and harness them and hack everybody's immune system so that they can do that, that's really the trick. That's the question.

Lou Reese: It turns out that a lot of these older high performers have antibodies that their bodies naturally generate against the toxins that their bodies are naturally generating. When you look at the blood of some of these high performers and high performing agers, what you see is that they actually have antibodies against alpha-synuclein and forms of Abeta.

Dave Asprey: You got to describe what these are for people who don't know those.

Lou Reese: Alpha-synuclein is a protein that's frequently linked to Parkinson's. Abeta is a protein that on its own is probably quite helpful, probably actually clears bacteria that somehow makes it across the blood brain barrier. However, as you age, just like your skin changes its texture, those Abeta molecules change and they glob up and when they glob up, they form dimers and oligomers and fibrils, which means they're stuck together. When you got that stuff stuck together, science just did an article on this a couple weeks ago, it causes neuronal death because you disrupt the communication between the synapses and neurons and that literally causes the neuronal death.

Lou Reese: What we see is in the people that have those antibodies naturally, they don't have that neuronal death, they don't have those consequences and they don't have the impending diseases. I think that what we have is an opportunity and a technology platform, really, that allows us to specifically alert the body to these targets one at a time and the body then generates those exact antibodies like my grandfather and these super agers. It's amazing because then you get the results that those super agers get. You have an antibody production that is actively clearing only those toxic endogenous proteins, which is really amazing.

Dave Asprey: What if you get it wrong? What if you turn on an antibody to something useful? Like, dare I say, cholesterol.

Lou Reese: Yes. Cholesterol is a great example. It's my belief that if you turn on the immune system to something that is a harmful target, there's absolute risk to that. That's something that we are so focused on avoiding and that's why we go after primarily targets that are by their very nature, toxic and should not be there.

Dave Asprey: Cholesterol is a substrate for testosterone and cell membranes, it's not toxic.

Lou Reese: With cholesterol, we're not actually going after cholesterol, we're going after PCSK9.

Dave Asprey: Now, what is that compared to cholesterol?

Lou Reese: PCSK9 is a hormone that has been related to the types of cholesterol specifically that lead to coronary events. There are approved monoclonal antibody drugs that are the next line of treatment in addition or conjunction with statins or on independent of statins, usually in conjunction though. You have to go through multiple lines of treatment of statins that might not be effective for you before anyone will agree to pay for the PCSK9 monoclonal antibody because the insurance won't pay for it, nobody's going to pay for it until you've gone through these lines of treatment.

Lou Reese: By then, the damage done to your heart is irrevocable. At the time that's, you know, you're on your last leg, so to speak, you then can have access to this PCSK9 vaccine. To me, this is immoral, this is fundamentally wrong. What it means is it means that what we need to do is have every single form of medicine or health available to everyone democratized and absolutely, that is our priority. Our vaccine technology, and I'm using that word very loosely because it's really a long acting biologic, it's something that's just really body-dependent. Your body, your immune system is being unlocked and unleashed to target toxins that are generated by that exact immune system. The most sophisticated machine in the world, ever, is our immune system and we're really just targeting it at these misshapen or these elements of chronic illness, these toxins.

Dave Asprey: Okay. We know there are genotypes where you make excessive either oxidized cholesterol or small particles that are not good for you and if there's a way to tell your immune system, "Hey, go after the thing that's making that and turn down what you're doing," that makes a lot of sense.

Lou Reese: That's exactly the system. I mean, that's the goal. What's interesting to me and what I find is a moral imperative is how great is it that by using this technology platform, by unlocking the body's own power, you can democratize these drugs that people can't afford. You know, it's a matter of really helping, doing our very best to eliminate this little area of suffering.

Dave Asprey: I would say flat out statins are bad for 99% of people that take them because they destroy mitochondrial function. The evidence is pretty clear there to the point that some of the drug companies have patents on putting like coenzyme Q10 with the statin drugs because they know it's causing harm, but they don't actually sell that but it is patented. I've looked at this for years, these statins are a bunch of garbage and people with low testosterone talk about low quality of life. But what you are talking about is saying you're not going to give someone low cholesterol, you're going to turn off the formation, or at least turn down the formation of certain types of this by having the immune system do something.

Lou Reese: Absolutely.

Dave Asprey: Now people might say, "Hold on, that's the vaccine." I'm going to talk about something weird that I've done that's going to drive people nuts. There's a form of allergy therapy ... I've had allergies, especially when I was young and I still have some food allergies, but it turned down pretty dramatically, some of the mold allergies. You guys want to hear something gross? I know that you probably are, it's problematical. There's a guy who figured this out about 20 years ago. You can collect the immune signaling molecules from your urine after an exposure. We've all heard of this, you know, Indian thing where you drink your urine.

Lou Reese: I'm very familiar with it. My father was a practitioner of that.

Dave Asprey: Yeah? No kidding. It had those antibodies. Are you a practitioner of that?

Lou Reese: It depends on the situation but yes.

Dave Asprey: All right. There we go. I will admit I tried it. I read the book years ago, I was like, "All right, anything that's going to make me perform better." Like I said, if I could live on gravel, like screw those vegans eating vegetables, that's me and I like gravel ... By the way, gravel doesn't work. You know, neither does a vegan diet, just to be really clear. Anyway, if you go down that whole path, like, "I'm going to try this." I tried it and it was not as horrible as you think but certainly not pleasant at all, didn't see any results. I found this cool ...

Lou Reese: It's better chilled.

Dave Asprey: It's better chilled. I found if I blend it with ice ... Okay, I didn't ever do that. That's disgusting. What I did find out is you can eat something you're allergic to or roll in cat dander, whatever you're allergic to, wait for hours, and then collect your urine and it'll be full of IGG molecules. Then you take a sterile sample and inject it intramuscularly. When those proteins are injected intramuscularly, your body's like, "There's a foreign protein in my muscle. It's an invader. Let me make antibodies to my own antibodies," which is a beautiful hack. You know what? It actually works, it reduced my sensitivity. I did this at a doctor's office and then I'm like, "This is too much work." I ordered the little filters that you put on the syringe and I just did it at home for a while. Yes, I self-injected my own urine. How metal is that?

Lou Reese: I haven't done the self-injecting of the urine. Got to be clear on that, [crosstalk 00:16:56] up but I'm now very interested.

Dave Asprey: It's not too late to start. This is just an example. I'm sharing this probably because it's like, "What the heck?" But also the idea of using your immune system to tell your body to behave is something that is cool. Now what you're

doing though, when you talk about vaccines, vaccines have developed the negative rap. Why is this?

Lou Reese: Vaccines, that term is misunderstood and categorized across a broad variety of things. No one has ever successfully vaccinated ... There's no single product in animal or man approved, with the exception of our platform technology, against an endogenous target.

Dave Asprey: Endogenous meaning it's already onboard.

Lou Reese: Meaning something that the body generates.

Dave Asprey: Versus something from outside like an infectious disease.

Lou Reese: Yeah, and those guys we call them exogenous. These are big words that I have to use a lot because otherwise these folks ... You know, everybody always wants them to be those.

Dave Asprey: [crosstalk 00:17:58] those two.

Lou Reese: It's those enemies outside or those enemies inside. Then enemies inside, it's real hard to get the immune system to want to do this. The reason is that by definition, getting the body to attack things, our antibodies create antibodies against things inside, by definition or theoretically, in an unchecked manner, that is absolutely an autoimmune response. That's the definition of an autoimmune response. What you don't want is an autoimmune response that isn't directed towards something toxic. If you can create, which we've been able to do successfully in every patient that's been vaccinated, if you can generate antibodies against highly specific toxic targets that are inside, you basically have made your own body a drug factory against the toxic forms of proteins floating around in your body.

Dave Asprey: You could conceivably say, "Well, here's what the anti-thyroid antibodies look like," and people have Hashimoto's. And you could then say, "Hey, body, make antibodies for your anti-thyroid antibodies," and you could cancel out an autoimmune response.

Lou Reese: Yes, absolutely.

Dave Asprey: The technology platform you're working on could allow us to figure out what things are causing autoimmunity and go through and selectively turn off autoimmunity to a bunch of things.

Lou Reese: Absolutely.

Dave Asprey: That could be kind of cool because a huge number of the things that cause aging are tied to autoimmunity, because long-term chronic inflammation will cause at least three of the seven pillars of aging that I talked about in Superhuman.

Lou Reese: That's a very good example. A brilliant, brilliant link there because that's exactly what one of the other kind of areas of focus that we have are on certain targets, hormones specifically that are related to exactly chronic inflammation. If you can target certain interleukin receptors, we have a belief that you would be able to actually, you know, fight elements of chronic inflammation.

Dave Asprey: If that was a mouthful, there are certain inflammatory cytokines. These are compounds of inflammation that are created by eating bad fats via chronic inflammation, chronic stress, having bad bacteria in your gut, making lipopolysaccharides. There's a long list of things, Lyme disease, toxic mold, probably some types of electromagnetic frequencies. But anytime there's inflammation, there will be one of a handful of inflammatory compounds.

Dave Asprey: I do a lot nutritionally with herbals and fish oils and all sorts of stuff to manage my inflammatory response because I have one hell of an inflammatory response because I have a history of autoimmunity, history of obesity, stuff runs in my family, I have genetic stuffs. I'm set up for inflammatory failure. I'm like, "I'm not going down that path." You're saying there may be a day down the road where we can figure out which inflammatory cytokines are the problems for me until my body could just stop that shit and it's actually going to be an injection or an oral supplement or something I can take this going to do that?

Lou Reese: There would be an IM injection. It would be one of the hallmarks of our long acting biologic platform is that you only really need to get these IM injections once a year, once every six months after the initial prime and boost paradigm. These are extremely convenient, it's convenient or more convenient than any flu vaccine. In the future, these are moderately near term realities, what I would like to see is this is about distributing and democratizing health. 80% of the people on the planet receive some form of inoculations that have increased health span dramatically.

Lou Reese: If you have an opportunity to think of that many people ... We're talking 6.8 billion people, if you can target all of those people with an existing infrastructure that's as simple as a shot, you can really do a huge part of eliminating chronic illness. And back to the specifics with the cytokines is absolutely, you know, what we're going to find is that certain people have different levels of cytokines and they're responsible for all of that.

Lou Reese: When we, do one of the great things about the long acting biologic platform is that we can combine targets. We can do it without cross reactivity, meaning without harmful side effects or any consequences to the immune system or the body. We can have the body go after multiple targets that would be specific to today's issue with inflammation or specific to those issue with inflammation. I

think that that specificity, that personalization of the paradigm of medicine and health is an amazing thing to witness right now.

Dave Asprey: You said some big stuff, you know, democratization, the future. Am I going to get a free dose of thimerosal or aluminum or any other real yummy adjuvants with this kind of stuff?

Lou Reese: You know, everyone uses a different adjuvant.

Dave Asprey: Define what adjuvant is for people who aren't familiar with it.

Lou Reese: An adjuvant is like the extra stuff that they shove into things so that it mixes and turns into liquid.

Dave Asprey: I thought that was an emulsifier. The adjuvant was something that was more to trigger an immune response in excess of what the compound would do.

Lou Reese: To be honest, it's both. You're using both. It's heavily utilized for the compounding purpose. One of the realities of adjuvant is some of them absolutely, Adjufos as an example, have been shown to increase immune response and there are very few however, that are approved. One of the things that I think is actually necessary in the space and one of the things that we're working on as well, is increasing the breadth of things that are approved as adjuvants because I think that's going to be critical so that we can get past the Adjufos days and into water and oil emulsions, for example.

Dave Asprey: You're saying one of the problems is that you'd like to use things that might be safer but you're not allowed from a regulatory perspective?

Lou Reese: You have to follow a very tight regulatory pathway in terms of what adjuvants you're utilizing and which ones are approved, otherwise you're actually getting an Adjuvant approved first and then a drug that would be helpful.

Dave Asprey: Can't you just make the drug without the adjuvants? I mean, you can get adjuvant-free vaccines of like ... I think I got a tetanus one a while back, I actually got tetanus.

Lou Reese: Really?

Dave Asprey: Like lockjaw, you know, go to the hospital, they better give you the immunoglobulin things or you die sort of thing.

Lou Reese: Wow. Well, that must have been tough on the podcast.

Dave Asprey: The joys of living on a farm and stepping on a rusty nail and then getting on an airplane are many.

Lou Reese: Oh my gosh. How long does it take to happen?

Dave Asprey: You know, it took about four or five days and thought, "I'll just ... " The nail didn't go in very far, "I'll just wipe it with some iodine. I'm fine. If I had more time, I would hit it with ozone, which probably would have prevented the problem." Then I'm like, "This is a little infected." Then two days later, I started getting the tingling. My wife is an ER doctor, she's like, "You're going to the hospital. I'm calling them and telling them to fly this stuff ahead of time. This is actually, wait another six hours, you could die." I [inaudible 00:25:10] even though I looked healthy.

Lou Reese: Well, I'm really glad that that worked out. I mean-

Dave Asprey: They did send in the tetanus vaccine that didn't have the adjuvants in it because I have a history of responsiveness to thimerosal. When I say history, my wife and I started a medical lab testing company in the mid-2000s that was doing radioactive cell counting of white blood cell proliferation in response to different environmental toxicants. You could actually test white blood cell proliferation in response to metallic mercury or thimerosal. In my blood, we found that I responded very heavily from an immune perspective to that adjuvant. It wasn't antibody-mediated, it was something else.

Dave Asprey: What I'm saying is I have some concerns about all the other crap that's in vaccines but I also really like the idea of telling your buddy, "Hey, you know, I would like you to follow these immune rules." If we don't solve this problem and just get past all the emotional reactivity on either side of that debate, and just say, "Look, how do we get a signal into the body that says, 'Hey, eat up this thing that will kill you?'" It seems important or like, "I'm going to pull all the blood out of the body and run it through this giant machine. You can live in an iron lung and web nanobots." That all seems like more work than just programming the system a little bit better. I'm kind of excited about what you're doing but I want to know you're not going to shoot some other stuff into me that I don't really want.

Lou Reese: The way that we have designed this long acting biologic platform is that the ... So far, and you know, you always got to do ... You always have to think about the future. But in every person that we've used this platform, it's been unbelievably safe.

Dave Asprey: How many people are we talking about?

Lou Reese: There's been over 100 people or right around 100 people that have gone through different trials with us. One of the things that's very-

Dave Asprey: How many of your own injections have you taken? I just want an answer.

Lou Reese: I can tell you that we have used this long acting biologic platform against endogenous targets in pigs, which are remarkably similar to humans and we ...

Dave Asprey: And delicious.

Lou Reese: And delicious. I love bacon. Nothing's better than bacon. It's remarkable because what we've seen is that with those five billion pigs, we vaccinated 25% of the pigs in the whole world.

Dave Asprey: Not we, United Neurosciences but as humans [crosstalk 00:27:31]

Lou Reese: A company that is affiliated sister company that is only for animals that uses this platform technology. That company, for example, has vaccinated over five billion pigs.

Dave Asprey: For what?

Lou Reese: For LHRH and for Foot and Mouth Disease. Depending on the incidence. Now, what's interesting about this is that there's been contrary to any safety concerns. It's actually taken significant percentage of market share from other companies that were using what I would consider to be ...

Dave Asprey: Using antibiotics, right?

Lou Reese: Yeah, they're using ... Well, they use antibiotics, they use vaccines from major pharmaceutical companies, they use a variety of things to maintain these pigs. One of the things that's ... LHRH, you know, that's an immuno castration, that's allowing your body to castrate itself. The reason that we have to do that with pigs, nobody knows this about pigs, but all male pigs are castrated because if they're not, they have androsterone and it makes them ... It's called boar taint. It makes the meat unpalatable to male consumption basically, because only men have adverse reaction to androsterone but it makes it inedible. One of the things that we've been able-

Dave Asprey: Hang on a second. My pigs aren't castrated. I have eight pigs. I mean, we butcher them after probably they're less than a year old. But maybe that's why but you can't tell the difference in a male pig and a female pig. But if you let them grow tusks and mature, then you have to cut out glands and do all sorts of weird stuff, I don't know how to do. But for commercial farming, you don't want boars to grow tusks and put all their energy into that stuff and it does create a stronger flavor, especially if they're highly crowded and stressed, which my pigs aren't.

Lou Reese: Which makes them better pigs. I mean, you know, happy pigs are better pigs, just like happy people are better people.

Dave Asprey: It's actually unethical to crowd pigs the way they do so I'm not a fan of industrial raised meat. But the idea that you could use antibiotics, which will kill the planet if we keep doing it that way, including glyphosate, but just antibiotic resistance is destroying our soil, our waters, our ecosystems, our gut bacteria. If you can do a vaccine instead of heavy duty vaccine in animals to have heavy duty antibiotics, I would choose the vaccine every time unless it means the meat does something weird do human immune systems. Any studies on that?

Lou Reese: Yes, we studied extensively. In order to do any of these things, particularly in feedstock, anything that's going to be consumed, there're expensive tests around that in terms of the transmission of any toxins to potential consumers or anyone who would eat it. You do those in both animals. You also do extensive testing around it. You're giving huge quantities of these things so that you make sure that they're safe and inert.

Dave Asprey: Back to your own use of your own company's products.

Lou Reese: Yeah. What I like about that is that that gave us tremendous confidence in going after a broader group of targets. The reason I mentioned pigs in the first place is because that was the first ever platform that was licensed against an endogenous target in humans or animals. The reason was that it was safe and it did the job, and it did the job in a way that was disruptive for farmers and disruptive for the pigs. Because one of the worst things to see if you've ever been inside of a commercial farm is when they castrate the pigs, all the other pigs are biting them and licking them and the wounds are unbelievably detrimental to the feed conversion ratio and the health of the pig. Meaning that they don't add as much weight thereafter because they're stressed.

Dave Asprey: Wait a minute, we all know it's calories in and calories out. There could be no such thing as a feed conversion ratio. What are you talking about?

Lou Reese: Well, you know, it's one of them things. The farmers are very specific about it, you know, that's their key metric. What I find in-

Dave Asprey: Humans are different because with us, it's calories in, calories but every other animal ...

Lou Reese: That's different. Exactly. Humans are special.

Dave Asprey: If you're listening to this again, what's Dave talking about? Ranchers and farmers know damn well that if you feed certain drugs or do certain things to animals, they get fat on way less or way more calories. Humans are the same way. Anyone who tells you it's about counting your calories is completely ignorant of biology. There. All right. Keep going.

Lou Reese: Couldn't agree more. It's really an interesting time. I couldn't be happier to be alive right now. When you wake up and you look at the level of innovation and

change and promise and understanding that we have of the body and the fact that these things are becoming more and more clear. Now, we're still looking through a fog, right? Nothing's 100%, nobody knows everything about the body, mysteries are unlocked on a daily basis. Thank you, Dave. One of the things that we're looking at is that's a future with less suffering and that's a future with a greater health span.

Dave Asprey: I'm totally down with all that stuff and I'm still fascinated with this idea. You got to tell me, if you can't tell me that you've used your own company stuff because you have ... You know, you want to get life insurance or there's some regulatory reasons, you say, "I can't answer that question." But otherwise, you're going to have to tell me why you haven't used your company's products on yourself.

Lou Reese: Well, okay, I'll tell you truth. I have absolutely been adamant with my head of regulatory that I would like to. One of the issues that I have is that it's a big responsibility to try to save or help or eliminate suffering for the entire planet as best I can, and one of the things I can't do is mess that up. I can't do anything that would lead to me not being able to help other people. At this exact moment, that's the reason why I haven't. It's strictly based on the regulatory reality ...

Dave Asprey: But no one would know.

Lou Reese: Well, today, they would.

Dave Asprey: You guys sneak a little sample out and jab it in your ass. I mean, how hard is it?

Lou Reese: Well, it would absolutely be that easy and that is something that I had threatened repeatedly with my head of R&D.

Dave Asprey: Now we're getting somewhere.

Lou Reese: That's exactly what I'm ... The answer is I'm absolutely willing and able to take this vaccine, any of these drugs, any of the products we make, I think they're 100% percent safe. Personally, I'm 100% behind it. There's nothing that I believe in more. The reality of the regulatory thresholds and hurdles around that and allowing that to happen without a potential impact with the FDA or the EMEA or any of the other regulatory bodies, that's the only risk that makes me not want to do it, is that I want to make sure that these get to people.

Dave Asprey: You're concerned that if at this stage of the drug development, you go and you use your own company's drugs off label that a regulatory agency within come in and say you didn't follow appropriate investigatory things, you weren't registered in a clinical trial. Why don't you just register yourself in one of your clinical trials?

Lou Reese: That's a great question and absolutely something that I've also pitched in my head of regulatory. I've been pushing this really hard. If you ever talked to [Leesha 00:34:47], he'll let you know. This is something that I am adamantly on board with. The issue, which is amazing, is that, you know, we have very specific criteria for these clinical trials. You have to be a certain age, which I'm not. You have to have a certain set of diagnostic backgrounds, depending on it, which I don't. It's very difficult because, again, I don't want to jeopardize what I'm doing because it could hurt billions of people.

Dave Asprey: Yeah. You're first in line?

Lou Reese: I am first in line.

Dave Asprey: Will you commit that when this is a commercially shipping, each of these, a commercial shipping drug, that you'll be the first person to inject the commercial shipping dose?

Lou Reese: Absolutely.

Dave Asprey: It is legal. All right. That's a pretty big commitment.

Lou Reese: Okay. I'm on. I mean, this is something where ... You know, we're not doing this for any other reason than to do our part in eliminating the areas that we think are the largest areas of human suffering.

Dave Asprey: You have kids.

Lou Reese: I do, I have two amazing kids.

Dave Asprey: How old?

Lou Reese: Five and eight.

Dave Asprey: They're going to get it.

Lou Reese: Absolutely. Depending on these ... Absolutely they will, depending on their age and when it would be appropriate to utilize these medicines. You know, in other words, where the risk factors come in, absolutely, 100%. Yeah.

Dave Asprey: What's the age that you think we should start using these signaling molecules for anti-aging?

Lou Reese: I think that preventing problems is easier than solving them.

Dave Asprey: Amen.

Lou Reese: I think that Einstein had a great quote around this. He said, "Smart people solve problems and geniuses prevent them." Unfortunately, I'm not a genius but I still believe that our team is filled with geniuses and I think that we can solve these problems and I think that we can solve them by prevention. Not by doing it after the fact, not by seeing how much damage can be done first. My answer is as early as possible.

Lou Reese: For something like the PCSK9 treatment, it's my belief that those targets are things that in theory and after appropriate regulatory hurdles and everything else that would be necessary are things that can be administered extremely. There was a study that recently came out that showed that at the age of 10, the average American child is already showing signs of the hardening of their arteries. At the age of 10, based on the typical diet in the West, children are seeing actual signs of atherosclerosis such as the hardening of the arteries.

Dave Asprey: You've clearly seen the kid's menu at most restaurants. Jesus H. Christ, it's so unacceptable. My son, just two days ago, is like, "Daddy, I was at this thing and they gave me the menu and all they had was like these weird chicken fried things."

Lou Reese: Everything's fried.

Dave Asprey: He said, "I'm not going to eat those because I know I don't feel good when you eat that." He said, "There was some fruit so I ate a piece of fruit." He said, "Then I ate at one of the bars." Collagen bars of his own choice. He could have eaten the fried stuff, he's like, "My tummy hurts when I eat it. I don't want it." But if you imagine what most kids are eating because you save \$2 at the restaurant, no wonder they're doing that. But here's the concern.

Dave Asprey: Let's say that we go, "This is great," and we inject 10 million kids with this stuff that's going to make them live longer and then we start finding 20 years later that if they have the immune molecules created by your technology, that increases ... I'm making this up, but it increases tumor risk or some other bad thing, is there a counter agent to turn off? Do you make another ...

Lou Reese: That was such a great question, Dave. I'm so glad you asked that. What's interesting about this is the reason I say it's a long acting biologic, is because it's reversible. This is super important so if we screw it up, we can unscrew it up.

Dave Asprey: Okay, I didn't know what you're going to say to that but what's the deal there?

Lou Reese: The body will unscrew it up by itself.

Dave Asprey: How does that work?

Lou Reese: If you look at antibody levels in our trials and in our animal studies, what we see is that people return towards baseline, towards their normal level within a year.

So you're going after safe targets, you're going after targets that you aren't worried about safety associated with those targets and you return back to normal in a year. Sometimes faster actually. The idea is that the risk factor is unbelievably medicated.

Dave Asprey: Okay. It's going to sort of wear off after time.

Lou Reese: Exactly, yeah.

Dave Asprey: If you stopped doing your "booster shots" it won't happen. All right.

Lou Reese: Yeah, that's it.

Dave Asprey: Talk to me about accessibility. You're saying these are going to be cheaper than the ineffective drugs like statins and blood pressure medications, potentially, that are just out there all over the place. How cheap is cheap? When they launch, general price ranges and where do you think it's going to be 10 years from now? This isn't promised, by the way, because they haven't launched and I'm sure you have a lot of manufacturing stuff, just give me ranges and thoughts.

Lou Reese: This is the way that I think about it. If you look at the most cutting edge therapies in the world, we're talking hundreds of thousands of dollars a year per patient or millions of dollars a year per patient. If we look at certain CAR T therapies, we're talking over a million dollars a year for single treatment and it's a single treatment solution. These are extremely expensive solutions and they offer unbelievable benefit to people. I love that that suffering has been eliminated and I commend the scientists that have made all of those amazing breakthroughs.

Lou Reese: My goal is for every single person on the planet to be able to afford this. My goal is for every single government on the planet to be able to afford this. The goal here is that we can absolutely treat at scale for what is going to amount to dollars a dose. Not hundreds of thousands of dollars a dose but dollars a dose. I believe that we can do this in a way that ... That's what I mean by democratizing health. Every single person should have access to the best health. I think that when you look at it, it's a moral prerogative, it's something that we have to do. You know, when my son asks me, "Why does one person have a \$200,000 car and another person lives on \$300 a day." I say, "It's because we're liars and we're ..."

Dave Asprey: \$300 a day? \$300 a month.

Lou Reese: A year. Because that was a real situation with this. We were in a very specific location and a friend, their average income was about a dollar a day. Their close friends, they had the ebrilliance of youth to ask, said, "Dad, why is it that you just bought a \$2,000 ukulele and our friend lives on \$300 a year." I said, "Because we're liars and hypocrites, son." That's what it is, you know. We sit

here and we say that everybody's equal and all people are equal and all genders are equal. But you know what? There's a lot of people that are dying and suffering from chronic illness that are only suffering because of lack of access to the best medicine.

Lou Reese: To me, my obligation to my son and my daughter and everyone that I know is to make that feeling of having it really be for everyone a reality. Because I don't want to see a differentiation and access to health span based on income, I want to see humankind and the power of humanity unleashed across socio-economic scales and across location. I want them all to be able to live the best possible lives and you can only do that when you're healthy.

Dave Asprey: Stress makes people make bad decisions. Bad short-term decisions as individuals, human beings but really bad decisions as leaders and even as societies. This chronic stress thing is a problem. If you're not healthy, you will have chronic stress by definition, when you're sick and you're stressed. I feel like we can make a lot better decisions in the world if we can solve some of this aging, some of this healthcare problem. I'm also sort of tormented by the lack of accessibility.

Dave Asprey: In Superhuman, the new book, I write about, "Here's the cheap thing or free thing you can do now. Here's the very affordable thing that's going to move the needle for this one metric of aging and here's what the crazy millionaires are doing right now that's going to come out there." In the slope of the curve for what you're doing with United Neuroscience, how fast is the cost going to drop? It goes from crazy millionaires who start when it first comes out the gate to average American is doing it to average Cambodian is doing it.

Lou Reese: Biotech is an interesting industry because a lot of times in order to access the overall market, you have to partner with companies that are marketing and distribution oriented and that have a lot of infrastructure and a lot of countries so that you can access and distribute in those partnerships. It's potentially, you know, out of my personal control exactly the way that the launch cycle happens. I can tell you that any products that we bring to market, which is absolutely our goal, and that we're marketing and that we're responsible for, will be accessible to everyone when they're available. Period.

Lou Reese: We're not going to do this sliding scale where first, millionaires and billionaires get to play and then we slide down and it's the United States gets to play and then we slide down and Cambodia gets ... That's not the game. The game here is that everybody gets to play. It's a fair playing field. It starts as a fair playing field and that's ... You know, have you ever met a disease that said, "I'm not going to get this rich guy sick?" Diseases don't discriminate.

Dave Asprey: It's totally true.

Lou Reese: And medicine can't discriminate.

Dave Asprey: The best thing that can ever happen is you have a billionaire who either their family member or they get some disease, because they're like, "You know what? All the yachts and all the other cool stuff I had that I thought mattered, none of it matters because I'm going to die and then they will direct their wealth to that." Using this with Google founders like, "I have risk of Alzheimer's? Let us just drop a bill on that."

Dave Asprey: It's pretty crazy but one of the benefits, and there are many downsides to that, almost stupid concentration of wealth is happening right now, is that it is allowing people to go after some of the causes of aging and diseases that would never get pharmaceutical company's support because there's necessarily a business model. There's just the, "I'm going to die and I have a lot of resources so I'm just going to throw them all at it." But the side impact on society of that kind of behavior might actually be really good. Because if you hack it for one person, you might hack it for everybody.

Lou Reese: Well, there's a person I admire a lot, Mike Milken, and he created faster cures. I think he's a real living example of someone who did exactly that. The end result has been significant improvement for humanity.

Dave Asprey: I think that it's a real thing. All right. I'm feeling more hopeful about what the future is going to look like in terms of aging and chronic disease. I think that you're on a good path for this stuff. What's your number? How long are you going to live? That's my final question for you. Given all this stuff you know.

Lou Reese: You know, I love those questions and I think about it all the time. I have two answers. One of them is I'm going to live forever, because we are the stuff of stars and I believe that.

Dave Asprey: The reincarnation sort of thing.

Lou Reese: No, I think that I don't even necessarily need to be reincarnated. I believe that we are energy and to energy we shall return. It's all the same. I think we're all connected and I really believe that. So that's the first answer. Now for a number, because a number is a useful metric.

Dave Asprey: Yeah. As soon as the stuff is commercially available or if you just don't tell anyone, you're going to be able to shoot yourself up with all sorts of custom stuff that no one knows about.

Lou Reese: This is so true. I actually think that some form of immortality is absolutely on the offing right now. If you talk with Peter Diamandis or if you talk with a lot of these other brilliant future thinkers, these futurists and these just innovators, the pace of innovation is so breakneck right now. The pace and generation and storage of information is so amazing that I believe that at least our consciousness will survive, whether or not that means that our physical bodies

will be there, I'm unclear on. I think our physical bodies have every chance of living to 150 or 200 years old in this lifespan.

Lou Reese: I think that right now, this is the age of unlocking. I think it's the time where we have an opportunity to reverse aging, I think that we have an opportunity to actually ... My friend Martine said this the other day, Martine Rothblatt, who's the CEO of United Therapeutics, it's, "Biotechnology is technology." I used to say, "We put the tech in biotech." They're very similar thoughts. The bottom line is that this is the revolution, this is the innovation, this is the future, this is the opportunity to really unlock health span.

Dave Asprey: Health span is such a weasel word. Screw that noise.

Lou Reese: What would you call it?

Dave Asprey: Health span? "I need to be healthy for as long until I die." No, screw that noise. I want to be healthy for way longer than I'm supposed to live. The health span is such a cop out.

Lou Reese: No, I don't think so. For me, what I mean is I don't want to be 150 and have Alzheimer's.

Dave Asprey: Okay, there you go. I want to be fully functional. But most people say health span, they're saying, "I don't think I can actually live longer so I just want to be healthy for as long as I live." Well, stop it. Just live way longer and be healthy the whole time and screw that noise. That's what I mean.

Lou Reese: I mean, extending health span and extending lifespan so that the whole span matters, the extended lifespan. What we're doing is we're ... I mean, think about it, what would be worse than living to 180 and have an Alzheimer's for 90 years of it? Nothing. What I'd like to do is make sure that we live much longer and healthy.

Dave Asprey: That's a good deal. Lou Reese, United Neuroscience. Do you have a URL where can people go to find out more about what you do?

Lou Reese: [www.unitedneuroscience.com](http://www.unitedneuroscience.com).

Dave Asprey: Did you just state it yourself? Who says www in front of a URL right now?

Lou Reese: I don't know.

Dave Asprey: Are you like 107? What was it though?

Lou Reese: Maybe. See? Look how well the aging is [crosstalk 00:49:56]

Dave Asprey: You're totally just giving a crap. All right, guys. If you just are saying, "Dave, you just talked about vaccines and you didn't shit on them." Actually, that's totally true. Because you know what? I'm not for or against vaccines, I'm not for or against drugs, I'm not for or against liquid diets, I just like to know what liquid the diet's made out of because the gasoline diet probably is a bad idea. Use your head, use your thinking. Protein is not good or bad for you, fat is not good or bad for you, water is not good or bad for you and air is not good or bad for you. It's all about the dose, the timing and what's actually in there. That's how you control your biology.

Dave Asprey: This is an example of the cool stuff that's coming down the pipeline that is actually going to change the future in ways you haven't even thought of. Hopefully, you enjoyed the show. If you did, leave a review. If you don't have a copy of Superhuman yet, you want to know what's happening right now, read Superhuman. It is literally the roadmap for living longer than Mother Nature wants you to. Have a great day.