

Jamie Metzl:

I think that you're right, that we're all seeing this incredible moment, as I was saying about we're all a little piece of FDR, because where people are saying, "The government isn't doing it. How are we going to get the information we need? How are we going to organize to do what needs to be done?" I think this is a destructive moment, but it's also a really creative moment amidst all the pain.

Announcer:

Bulletproof Radio, a state of high performance.

Dave Asprey:

You're listening to Bulletproof Radio with Dave Asprey. Today's guest is Jamie Metzl. He's a leading futurist, geopolitical expert, a science fiction writer, media commentator and senior fellow at the Atlantic Council. He served in the White House State Department, United Nations, Iron Man triathlete, and he's the World Health Organization's expert advisory committee member on developing global standards for governance of human genome editing. He also knows a thing or two about Coronavirus and viruses and how we might make ourselves more resistant. So this is going to be a show not about what should you do right now, because there's things going on, but what are we going to do so that we hack ourselves out of this problem that has existed since before there were humans?

Dave:

Jamie, welcome to the show.

Jamie:

Thanks, Dave. Happy to be here.

Dave:

One of the ways we first got connected is that you're a faculty member at Singularity University, which is Peter Diamandis' thing. I don't know. His group in Silicon Valley, I've lectured there. I'm actually an adjunct faculty member, although I haven't actually done a formal course there. So I've seen you around and about, but you've talked about the future of genetic engineering. I've got to ask this straight up front. A lot of people listening to the show, including me, are very suspicious of genetic engineering, because mostly, it's been used to sell a lot more toxic soil things.

Dave:

It's been used to sell pesticides basically, and herbicides, not necessarily to do good for the world. Is it really safe?

Jamie:

Well, so there's a lot in there. Let me just cut to the chase. When people think about genetic engineering, the first story that people have in their minds is genetically modified organisms. That's really that's a technology that's been around since the 1970s. They used to call it recombinant DNA. Everybody's had this fear, and a lot of people have a fear of genetically modified crops. Some of that is very real, but at the same time, genetic modification is something that our ancestors have been doing for thousands of years.

Jamie:

Go back 10,000 years. You can't find corn. You can't find most of the things that you buy in Whole Foods, even in the organic section. So our ancestors have been using selective breeding to hack all sorts of things including plants and animals, and our ability to do that has obviously jumped up, and now we're able to use technologies to jump species. With jumping species, that brings everybody to this situation that we're facing now with the coronavirus. There's a lot of things that have jumped species. We actually have tons of viral DNA within us as humans. So the boundaries between-

Dave:

Percentage, what percentage of us is viral DNA?

Jamie:

It's six or 7%. I mean, it's a lot. It's like our whole history is that. First was genetically modified crops, and we'll jump over that pretty quickly. Nobody said we have to have... We have 7.7 billion humans going to maybe 10 billion humans. Nobody said we had to do that. If we're going to do that, and we want people to live, we're going to have to use our technologies to make that possible. Our technologies like farming, like cities, like housing, are getting us to this number. So every technology has its upside. It's ways they can help us. Its downside ways that can hurt us, and so it can't be technology yes or no.

Jamie:

It has to be, "How do we best use technologies to help us and not hurt us?" Let me just jump very quickly. Your next thing is for humans, we have these technology. It really is important because we are going to be able to hack ourselves to get rid of deadly diseases and disorders and maybe protect us from deadly viruses, but the same technologies just like GMOs could be.

Dave:

Thank you. Very well said, and for people listening, am I for or against genetic engineering? It depends on how you're doing it, where you're doing it, where you release it and what the intent is. That's like saying, "Are you for or against liquid?" I don't know. Doesn't context matter? By the way, my answer would be the same for vaccines. They're not without risk because there are provable risks. It depends which person, which vaccine for what reason, et cetera, et cetera, their schedules, and there's probably a genetic and a microbiome thing to that we don't even understand.

Dave:

Don't be one of those shrill for or against anything, whether it's pharmaceuticals, whether it's liquids, whether it's a certain plant protein or whatever. None of those categories are actually scientifically valid. What is valid is risk reward analysis with very strict things. I've also gone on record Jamie is saying, "Look, I want to genetically engineer my mitochondrial DNA. I want to make my mitochondria into super mitochondria that make more energy and are super resilient to everything you can think of. I would do that right now if we had reasonable studies, if I could hold up my hand to be the first person to do it."

Jamie:

Dave, let me just interrupt you right there. Don't hold up your hand to be the first person. Let somebody else do that. You want to be even as an early adopter like you, someone who's thinking big thoughts about where we're going, you know what they call the first person? A guinea pig. Be the 10,000th

person once some other suckers have tested it because what we're talking about are systemic hacks to the humans. I remember there was a while ago, a few years ago, people had this science that Liz Blackburn and others developed telomeres.

Jamie:

I can tell you what she said because we were together on the stage at Google Zeitgeist not so long ago. When she said it's better to have longer telomeres, and so everyone said, "Oh, we should start taking telomerase, but then you get cancer." That's why you have to do all the things that you talked about, about healthy lifestyle. Just because something sounds good or it's helping mice doesn't mean it's necessarily safe or the right thing for us to do. That's why I completely agree with what you said, let's do the analysis. Let's use the hard science, but then let's...

Jamie:

I think we should be aggressive and creative, because this biology that we've inherited is buggy by design. That's what evolution is all about. You have mutations. Some of them are helpful, and some of them are harmful. Over time, your ones that are helpful within a given context went out.

Dave:

We'd like to think that. We say some other sucker. A lot of times, doctors would be willing to do this on themselves, but they won't, because that could get in the way of regulatory approval, or there's people like me who are saying, "Yeah, I'll do it." People say, "Oh, no, I'm sorry. I can't do it on you. It might hurt our company valuation, because we're only in phase one trials. We have to get permission, and we're going to spend a billion dollars to get this thing to market." How does that work?

Jamie:

Our whole pharmaceutical system is totally insane and corrupt. When they talk about this billion dollars to get to market, part of it is really legitimate science. Part of it is passing on the cost of marketing. We're one of the only countries in the world that has direct to consumer marketing, and that's woven in. Part of it is just the partial at least dysfunction of our regulatory process and all the legal procedures and things like that. We have a great FDA, but what we've noticed in this coronavirus crisis is that our whole country, we've become bloated and inefficient.

Jamie:

We're the country that invented the entire concept of public health, but we can't mount the kind of public health response that South Korea or Taiwan or Singapore can mount, even though we trained all of the people, all the leading people in those countries, so I totally agree that we need to find a balance between individuals making the best decisions for themselves, but within the context of a functioning government that's at least protecting people against things that are unsafe, because especially for things like this, like aging, nobody likes aging. People that you said this may work, people will do all kinds of experiments on themselves.

Jamie:

Maybe if you're a really advanced scientist, that's one thing, but if you're somebody, old lady or man or whatever it may be, even my mother is not so old, but who's saying she doesn't like aging. If I call and say, "Hey, take this," she'll probably take it, and so I think it's good to have some process for evaluating what's reliable and what's not. That's a role that governments I think can reasonably play.

Dave:

You've said, and I tend to agree with you, that we can actually engineer humans to be virus resistant. How would you go about doing that and doing it safely?

Jamie:

Yes. It's already been tried. As you know, the world's first three genome-edited CRISPR babies already exist. I write about that in my new book, *Hacking Darwin*. So there are these three babies in China. All of them were when they were pre-implanted embryos, their genomes were edited with the goal of mutating their CCR5 gene. I know that's technical, but basically, that's a gene where some particularly northern Europeans have a mutation that makes them increasingly resistant, enhances their resistance to HIV. So HIV is a virus.

Jamie:

Like the coronavirus, it's a zoonotic virus, a virus that jumped from animals to humans. We know that this Coronavirus, it binds on the ACE2 receptor. So conceptually, if let's just say we wanted to do an intervention that blocked this one virus, it wouldn't make a lot of sense because the ACE... It's not like this gene is just sitting around doing nothing waiting for a virus to attack it. It's also helping regulate our heart function. That's one thing is that we for specific viruses, we could interrupt the place where they attach to ourselves, our cell membranes, but then there are people like the amazing George Church at Harvard.

Jamie:

George and I are doing an event together next week talking about this and other things, who are saying, "Is it possible to engineer resistance to all viruses?" That's what they're working on now in their process of xenotransplantation, which is, in this case, trying to make pig organs that could be suitable for transplant into humans. They do that by knocking out a number of genes. So there are a lot of paths that we could take, and it feels a little sci-fi, but when you think that Jennifer Doudna and Emanuel Charpentier, they had the seminal paper on CRISPR, which was about how to edit a genome of just a simple cell.

Jamie:

That was 2012. Six years later, 2018, the world's first CRISPR human babies are born. I mean, this technology is moving at warp speed, and it's only getting faster. I mean, I also write sci-fi, but sci is becoming sci-fi.

Dave:

Do you have kids?

Jamie:

I don't have kids. I'm too young.

Dave:

When you do have kids, will you hack them?

Jamie:

First, in terms of hacking, and you talked about immunizations. I'm a huge believer in immunization, so getting immunized is a hack. Prenatal nutrition is a hack. I think that the first application that people can do today is not necessarily genome editing of pre-implanted embryos because there's no doubt, it's not yet safe for human applications, but embryo selection is happening all the time and there's a lot of power in embryo selection. So the way that you could do it, and I probably would definitely consider doing it even though I said I'm young, truth be told, I know your viewers, people watching this on YouTube can't tell.

Jamie:

I'm not as young as I used to be, FYI. For me, if I were to do with my girlfriend IVF and embryo screening, the way you extract the eggs from the mother, and let's say it's around 15 is the average. You fertilize those eggs through the process of IVF. Then rather than selecting one just by sight, essentially under a microscope, which is what an embryologist would normally do, you grow them for about five days, extract a few cells from each, and then you sequence those cells. Now, you've got a pretty decent sense not complete by any means of the blueprint of the game plan for each one of those, let's call them, 10 embryos.

Jamie:

Then you can say, "Well, which one of these is going to be, and then you can say, is going to have this certain number of single gene mutation diseases like sickle cell or tay-sachs?" You could probably rank them in order from likely tallest to likely shortest. We're a very short number of years, single digit number of years, from being able to rank them from likely highest genetic component of IQ to lowest. I mean, there are all kinds of ethical issues associated with this huge. That's why this isn't a conversation about science. Science brings us to the conversation. The conversation is about ethics, but would I select embryos to make sure that the one I was implanting didn't have a deadly genetic disorder?

Jamie:

For me, the answer is absolutely yes. Once I was going through this process to screen all of the embryos, and I had that additional information, even if it wasn't determinative by any means, would I want to know that? The answer is yes. Would that influence my selection? Yes. Let's just say through that process, I only have one embryo because I don't have... I only have one. Let's just say that one has a single gene mutation disorder that will determine, that will make it inevitable that that kid is going to die of a terrible disease.

Jamie:

Would I want that pre-implanted embryos to be gene edited just to make that one little switch? The answer to that is yes.

Dave:

What you also had already going in there, I mean, a little bit of resistance to viruses, extra six inches of height, some longevity genes that James Clements has identified with George Church.

Jamie:

Now, I wouldn't, because it's not safe, but I think just as in the beginning of the age of vaccinations, and 41 years ago, in the beginning of the era of IVF, people said, "Oh, that doesn't feel natural." Not now, not 10 years. 50 years from now, what you're describing is going to be, "Oh yeah, that's what we call

baby making." That people are, "We're going to use our technology," and it's not going to be like going to the build a bear workshop at the mall and just pick a bunch of traits, but it's going to be that you select the embryo.

Jamie:

Maybe they'll just... I mean, even with George, I mean, they have this great list of these, but it's single gene mutation changes. George and I debate this sometimes. I don't think it's going to be possible to make 1000 simultaneous changes. There's so much complexity in biology. It's not infinitely complex, but it's pretty darn complex, but to make a single change, especially if we're removing a risk, and we know because we don't... It's not like every gene is doing one thing. I mean, our genes are doing lots of things simultaneously. It's not just one symphony. It's like six symphonies happening simultaneously.

Jamie:

So if you're going to make a change, at least if you know that you're removing something that's a terrible risk, and you're changing it to something that's within the norm of humans, that seems a lot safer than the build a bear model.

Dave:

I think it does sound safer now. There's so much I want to go into on that. One of the things that happens naturally is that the system of a mother's body decides which egg drops, and it's an epigenetic decision that's made based on all the environmental variables that can be read by the mitochondria in a woman's body. It says, "This is the single egg that's most likely to survive the environment that I've been in for the last few months." This is why the ovaries are studded with more mitochondria than anywhere else in the body. At least I believe that's why. I can't explain why they're there.

Dave:

When you do what you're talking about, are you worried about making people reducing us to meet robots? This is the right egg. Now, I'll pick the right egg because I didn't like that one thing.

Jamie:

Yeah. That's a very real possibility. We need to be mindful of it. There are all these biological processes, and we only know what we know. We're a hubristic species always imagining that we know more than we do. I feel that about my life. At each point, I think, "Well, I really got it together." Then two years later, I think, "Oh my god, I was such an idiot two years ago. How did I make it?" There's a lot that we don't know. We don't know that. Even though there's can be over a billion sperm cells and average male ejaculation, one of those guys is racing faster than everybody else.

Jamie:

Why? What does it mean? How does that translate into fitness? There's a lot that we don't know. think, applying this whole re-engineering model is actually dangerous, but at the same time, I think we don't have to fetishize nature. I mean, the history of our species in some ways, sometimes where we like to imagine ourselves in harmony with nature, but we're at war with nature. When we were living in nature, nature was trying to kill us. That's why we did farming and cities and all that kind of stuff.

Dave:

If you want to fetishize nature, just fetishize the wasp that paralyzes the spider, lay its eggs in there so it they're going to be eaten out from the inside.

Jamie:

Exactly.

Dave:

At the same time, if you're in a fetishize nature, put away the clothing, those stuff that keep-

Jamie:

Exactly.

Dave:

... because that's a hack against nature.

Jamie:

Yes.

Dave:

Unquestionably, even most plants want to kill you. You don't believe me? Go outside and eat whatever plants you see, and you'll either end up dead in the hospital or very uncomfortable. That's how much nature loves us, right?

Jamie:

Yes.

Dave:

We're in alignment on that front. I just do wonder about that, if we take that selection part out without fetishizing nature, just saying that there's probably a complex system there that's evolved intelligently.

Jamie:

No, I agree, but nature has an error rate. We don't accept that error rate. So when somebody's kid dies of some terrible genetic abnormality, we don't call it an error rate. We call it a tragedy. I think that's the nature of our species, and so if we can do better than that error rate, if people come to feel that they're going to have a kid, and the likelihood of having just a healthy kid is better applying science than not applying science, I think that'll be the tipping point. There'll be very few people who will say, "Alright, there's this natural process. The natural process is safer than the scientific process, but I'm going to go for the science process just for the heck."

Jamie:

I mean, just like you said with self-experimentation, my guess is you'd experiment on yourself, but you wouldn't necessarily experiment on your kid if it brought additional risk to that kid. If you thought you could reduce that risk, then I think that would be part of your calculus.

Dave:

It does make sense. Let's talk about that risk thing. What about the people who are dying from coronavirus right now, the ones who are most likely to die? Is that an error rate from nature? Is that hackable.

Jamie:

Well, I think it is. We also need to think that not every hack is a genetic hack. I'm doing a lot of speaking on this. I actually gave a talk a couple of weeks ago for the big Singularity University COVID summit, and that talk went viral and has led to a bunch of other things, but here's the hack that we could have made that would have... the few hacks we could have made that could have totally prevented this crisis completely. We could have collectively created a world health organization that was empowered to do its job that had a global surveillance system, that had [crosstalk 00:21:21].

Dave:

That sounds great, global surveillance, man. You're getting all excited.

Jamie:

No, but for deadly pathogens, it's pretty important. Then when there was a trip wire was hit like happened in China, they had an emergency team that could immediately go to the place. These were people who are training all their lives to squash something like this. We have a WHO. It's not empowered to have that kind of surveillance system. China waited 42 days from when they knew about this to when they finally let the World Health Organization in. That's one hack we could have. Second hack we could have, the Chinese government could have been accountable to its people and wouldn't have suppressed this story for about three weeks, and let this small thing become huge.

Jamie:

Another hack we could have had is in the United States, we could have had a leadership that took this threat seriously, which is what the intelligence services were saying we should do, and didn't happen and the president of the United States, whatever you think about him, it's just the fact that he was saying, "It's not a big deal. This is all a hoax, and it's my enemies trying to get me," and we're all in trouble. Not every hack has to be scientific. We have a lot of forms of passing on our heredity, and culture and knowledge are really important parts of that inheritance.

Dave:

You're saying that the biggest hack would have been proper government systems in order to do this, back in the days when governments actually worked on behalf of people, except wait, hold on. That doesn't really happen anywhere on the planet that I can see governments tend to work on behalf of governments, otherwise they lose power. It's just the algorithm of being a government.

Jamie:

No. It's so funny you mentioned that. I totally agree. I mentioned my Singularity University talk. What I was making is this exact point that you've just made. What I said is that we have two stools of this world... I'm sorry, two legs of the stool of governance, and there are the states. Then after the Second World War, the states realize, "Well, geez, if left to our own devices, we'll kill each other. Let's create an

international organization like the UN," but then they thought, "Well, we're not going to give away our sovereignty to this UN. So we'll kind of have it, but we'll not make it work."

Jamie:

What I think and one of the things that I'm doing a lot of work on now is where is the voice of just humans who want our planet to survive because there's this total mismatch of these big global problems, deadly pathogens, climate change, weapons of mass destruction, but there's no political force that's saying, "Hey, we need to tackle these things." Then it happens, and we say, "Well, there's nothing we can do, because our states aren't up to the task." I definitely think that communities like you're building day with just people sharing ideas, this has to be the foundation of thinking differently about how we can together tackle common problems.

Dave:

I agree with you there. I don't know the right answer, and we're going to get to it on our podcast. You said something on CNN that I didn't understand about the coronavirus. You said this isn't really a 2001 moment. This is something much bigger. I think of it as a 1941 moment. I look at the number of people who died in especially from starvation in World War Two, and I don't think those match the global numbers even in the worst case scenarios here. Why do you bring it to this immobilized World War kind of thing?

Jamie:

It's certainly not in terms of the number of dead. I mean, there is no possible way that this virus could ever kill the number of people who were killed in the Second World War. What I mean by saying that is there's a lot of people now who their point of reference, our point of reference is 2001 because it feels like a moment like the year of the 9/11 attacks. The reason why I think this is more like 1941 is, I think, this disruption will end up being the biggest disruption since the Second World War.

Dave:

Economically or sociologically?

Jamie:

I think it started as a governance crisis, as I mentioned before, which became a health crisis, which is now becoming an economic crisis, which will become a series of political crises around the world. The government of Kosovo has already fallen, but there'll be lots of other big state problems, maybe state collapses, and that's going to morph, I think, into over the coming year or two into a geopolitical, a global crisis. That's one. I think this is the biggest disruption. I think that we have a huge battle ahead of ourselves, but also, the positive side is in 1941, FDR and Churchill came together.

Jamie:

FDR talked about the four freedoms. They articulated the Atlantic Charter. They set a North star, a set of principles that we need to fight for, and that they could begin building the world on the other side of that cataclysm. We have a huge fight ahead of us. The world on the other side is going to be very different from what it is going in, but now's the time we need to be thinking about what we want that world to look like, and making sure that it's a world that reflects our best values.

Dave:

That sounds like a soundbite, a world that reflects our best. What does that actually mean?

Jamie:

No. It's a great question. Yesterday, from this very table in my dining room. I led a call. We had 120 people from five continents, 23 countries. I had posted on... After my Singularity talk, I stayed up all night. I drafted what I called a declaration of global interdependence. I sent it out to my email list and said, "We have to fix this. We don't have enough... We're in this crisis. We don't have an FDR. We don't have a Churchill. We have to do it ourselves." The response just from that email has been great, and so we have to build this. It's like, "We don't have an FDR, but maybe everybody can be just a little piece of FDR."

Jamie:

If we come together, we can imagine something different. If you had gone to our ancestors, who were these little nomadic hill tribe, hill people, or nomads wandering around, and you said, "We're going to create a thing. It's going to be a state, and all these jackasses who are stealing your horses, you're going to be part of one team. And then you're going to have enemies in some other place that you've never heard of, and you don't even know it exists." You'd say like, "That's insane," and yet we did that. Then we had states, and they said, "Oh, we're going to have a thing, a league of nations where all these warring states are going to come together in Europe where they've been murdering each other for hundreds of years."

Jamie:

That was insane. So is it insane to think that we can have a new way of organizing ourselves where humans come together and say, "Hey, we We're humans, and we want these big human challenges solved?" It feels crazy now, but I hope that there's a path. Even if we try and spectacularly fail, maybe we'll only 90% fail. That means we 10% didn't fail.

Dave:

I am very hopeful that governments will actually have a little bit less influence, especially on these insane regulatory things, huge wastings of money, so that people become virtual citizens of multiple things. So it's ultimately where you spend your money. That drive is what happens. So when people join a community or join a movement that that is taking a bigger weight of their attention, of their time, and of their resources. Sure, we all need roads, and we all need the things governments do, but I think that there's been a lot of progress on all of these fronts that's been limited for political reasons, not because that's what people wanted, and it's been made 100 times more expensive than it needs to be.

Dave:

If people are saying, "I'm just going to do it. I didn't really need permission from the people who make my roads," maybe we'll get there. I don't really know, but I'm very concerned about this turning into just like 2001 did.

Jamie:

It's a great point, but what I would add to it is that there are... In the category that you say we need people to build roads, we need a center for disease control that does effective tests for pathogens. I definitely agree. Our government and lots of governments, they start leaning hungry, and they get big and bloated and that's a real problem, but the functions that our governments are now doing are really

essential. At a time like now, we're feeling the consequences of government failure. We're all coming together to try to solve it ourselves, but we need governments, but I totally agree our governments need to be lean and functional and not encroaching.

Jamie:

Ironically, all these libertarians who are reported libertarians who are leading our government now are because of the total government failure, we're becoming more socialist than even Bernie Sanders would have made us had he won the last election. I think it's finding the right balance is the key.

Dave:

It is finding the right balance. I might sound like a libertarian there. I'm not a libertarian. I was when I was 20. After you Ayn Rand, you'd be a libertarian for a year or two, but generally, you get over it. There, I pissed off all my libertarian friends. The point there though is people you and I know, heads of labs, some of them actually closely involved to Singularity, I was on the phone with him privately. They're saying, "Dave, we've had the ability to test for COVID for a very long time, and the regulatory agencies in the U.S. forbid us from offering this."

Dave:

I didn't need the government to allow me or not allow me or to bless a test. If they bless the test, I might have given it more credibility. They also blessed MSG which is bad for you and NutraSweet which is bad for you, so their blessing is of limited value.

Jamie:

I agree. I agree with that completely.

Dave:

You're like, "All right, guys, thank you. If I want your rubber stamp, I'll pay for it. And if not, get a better rubber stamp, and maybe I'll pay for it next time." What happened here is there are many people who would have written a check directly to a lab testing company with results better than what the current government PCR tests are. We just weren't allowed to do it. The CEO I spoke to specifically what I'm thinking of, he actually said, "I'm afraid." He said, "I can do these tests for six bucks. I'm afraid to offer it because of what the government will do to me if I offer it."

Dave:

When we create that kind of world where innovation is punished, that's a big contributor to this crisis that no one's talking about. It sounds like you're aware of it as well.

Jamie:

No, I totally agree with that, but I guess where I would push back a little bit is that we do need the government to set standards. If you go and you get some kind of diagnostic test, and they say, "Oh, you have cancer," but there's no standardization of that test, so you go here, you have cancer. You go there. You don't have cancer. You go here. You have COVID-19. You go there. You don't. That will cause a lot of disruption. So yes, if every company was behaving ethically, we wouldn't need any regulators. That's the role that government needs to play is setting standards.

Dave:

But don't block people. They have to say, "I don't meet the government standard, either because it doesn't exist or because it's dumb. And here's why it's dumb." If they allow that, we'd be in alignment, but what the government's, not just the U.S. government, all the governments are doing is saying basically, "If you don't play with our monopoly around these standards, then you don't get to do it." I'm saying in a world of pandemics and in a world where things are moving very rapidly, it should be a human's choice, whether they want to go with a standard or an unstandardized experimental test. I'd rather have...

Jamie:

I just think that governments need some... Societies need something to be regulated, like if you're getting your blood test, and it's telling you should do X, Y or Z, there needs to be some standard measure. That's a really important government function. If the government went away, then you'd say, "Oh, I'm getting this cancer drug. Maybe I'll..." An average person doesn't have the ability to evaluate whether Company A, B, or C is making an effective cancer drug, whether the product, whether the ingredients that they say are there are there or whether they were. I'm not saying we need government doing everything, but I think that there are some essential roles that governments play, and setting standards is a really important one.

Jamie:

That doesn't mean that they should block things, and our government completely screwed up. Frankly, if it's a screw up and nothing or just a bunch of chaos, frankly, even a bunch of chaos would have been better than what we have. I think we have to... I talked about seeing the North Star. The north star has to be lean government that's setting standards and then companies that are free and encouraged to innovate to meet those standards.

Dave:

Well, they have to be to meet or beat those standards. If we have standards, that's great. If companies are allowed to say, "These don't meet standards, yet we're selling them," so there's setting standards, there's enforcing standards, because what happens in a case like this, the standard test is a PCR test, which is pretty much a garbage test. Then the next company comes along and says, "Oh, we have an antibody test, which can actually tell you whether you have natural immunity." The government says, "That doesn't meet the standard," and two years later, they'll approve it, but that two years was a critical response time. We can no longer live in an environment where it's acceptable for anyone to do that.

Jamie:

No, I totally agree. Now is the test case of how desperate we are. We don't have the PCR and other tests for whether you have the virus. We don't have the serologic or the antibody test for whether you've had the virus and maybe you've developed antibodies. We don't even know enough to know whether if you've had it and have antibodies, whether you're fully protected and for how long. So we need our governments moving really quickly, and we've seen how sclerotic our government is here. You compare that to Taiwan and Singapore and those governments who we trained, who are really moving quickly. Ours is not an example of how to do things.

Jamie:

The only thing I'm saying is that my goal is to articulate what it should be, and then try to get as close to that as possible. We say we don't need regulation, and just everybody do your own thing. We're going to wind up with chaos. A lot of people are going to be taken advantage of, and not everybody has your level of sophistication. There's a reason why we have governments just to protect us from maybe from ourselves.

Dave:

You and I both believe that there ought to be governments here. I'm looking at how do we have human medical freedom, and even in a case like this to say, "I'd like data about my body," even data of questionable value, because there are enough people out there like the 120 people who get on call and would do good things. It pains me in times of crisis when the people want to do good things, frankly, have either the access or the money to do those good things and are forbidden to do those goods.

Jamie:

Yes.

Dave:

That happened here, and it's part of why we are where we are. It'll probably continue to be that way. I'm hoping that this highlights that. I can tell you that in the 1941 moment that you mentioned, when there were tanks rolling across the border, I'm pretty sure that the people who picked up something and did something about it didn't wait to have regulatory approval to throw sticks or...

Jamie:

I know, but going with that analogy, they would have been much better off organizing themselves, so they're not throwing sticks. That's why we have organized militaries. That's why we have organized governments, but I think that you're right. We're all seeing this incredible moment. That's why I was saying about we're all a little piece of FDR, because where people are saying, "Alright, the government isn't doing it. How are we going to get the information we need? How are we going to organize to do what needs to be done?" I think this is a destructive moment, but it's also a really creative moment amidst all the pain.

Dave:

It is a moment of great opportunity right now for businesses, for innovators and all. I think we agree on that. One reason I wanted to have you on, not just talk about the coronavirus and political responses and all that, this isn't really much of a political show. Hacking Darwin, your book on genetic engineering, it's level headed, where I'll tell people genetic engineering isn't good or bad. Just like I'll tell you vaccines aren't good or bad. I'm not as big of a fan of them as you are. There is a risk, and you just have to decide what is that risk, and do you really care about that vaccine or not?

Dave:

The flip side of it, though, to throw all vaccines out and to throw all genetic engineering out because of a dogmatic belief, it's entirely possible that we can have very clean vaccines if we continue looking at how our immune system works. In fact, I think that's where we're going. We will actually be able to get a vaccine that has nothing in it, but specific particles that activate your immune system without the things that are probably causing some of the problems in some of the people today, and there's all sorts of stuff floating around that I didn't want to touch it. The bottom line is it'll continue to innovate.

Dave:

They'll get better and better and better over time, and give us more control over our own biology. That's, I think, where both of us are. In your book, with genetic engineering, you're saying, "All right, here's the good side of it." The same thing, if some big company... Yes, I'm looking at you, Monsanto. You bunch of douche bags. You guys, you can't use genetic engineering to sell more of your stupid soil destroying pesticides. If you do it, the humans will rise up. The ones who are left after you destroy our food system will rise up. We will find you and hunt you down.

Dave:

Sorry, that's just how it works. So cut your shit out. Stop selling the poisons, and stop smearing the name of genetic engineering because it actually could be useful.

Jamie:

Do you want me to respond to that guy? Let me say a few things. They are not funding me. I don't get a penny from them. What I will say is I agree with you that genetic technologies are there. They can really be great. They can help us with all sorts of things, including agriculture. The way we're going to feed ourselves with 10 billion humans must include genetic technology. There's really no practical way that we can do it. Yes, nobody said we have to have 10 billion humans, even Monsanto, which now part of Bayer, they're actually...

Jamie:

You're going to hate me for saying this, doing some really important work on food science. I know that Monsanto is demonized, but on my website, [jamiemetzl.com](http://jamiemetzl.com), I have a blog post exactly that's laying out the case, not for Monsanto, but for genetically modified crops and how they can be done safely and should be done as one piece of the mix alongside sustainable agriculture and all those things. I 100% agree with you agreeing with me that human genetic engineering, it scares people, and it should scare people, but it excites people, and it should excite people because no one wants their parents to die of some terrible cancer or their kids to die.

Jamie:

These tools can help us but they can also hurt us. That's why we have to have conversations.

Dave:

We do. I mean, you get into things like gene drive for mosquitoes, where we can get rid of mosquitoes that spread malaria, which kills way more people every year than the coronavirus will over the next 10 years. By the way, that's why some of this economic stuff we're just doing doesn't make a lot of sense, but there are valid uses for it in life. I'm all over having every tool in our arsenal available and use them intelligently. You make a very important case for biohackers, for people who want control of their own biology in Hacking Darwin.

Dave:

You got to pay attention to and understand these technologies, so you don't demonize them and you don't blindly walk over a cliff either. I think you narrate that very nicely in the book. Thank you for writing the book. Thanks for being on the show. We're going to hop on Instagram next. If you guys are listening to the show recent episodes after the episodes when I record them, I go straight to my

Instagram page, Dave.Asprey, and let you ask a few questions of the guests before you've even heard the show. We're going to go there now.