



The genetics of alzheimers and why its a choice

Heather Sandison, N.D. interviewing
Kashif Khan



Heather Sandison, N.D.

Welcome to this episode of the Reverse Alzheimer's Summit. I'm here today with Kashif Khan. He's the Chief Executive Officer and founder of The DNA Company, where personalized medicine is being pioneered through unique insights into the human genome. Growing up in Vancouver, Canada as an immigrant, in an immigrant household, Kashif developed an industrious entrepreneurial spirit from a young age. Prior to his tenure at The DNA Company, Kashif advised a number of high-growth startups in a variety of industries. As Kashif dove into the fields of functional genomics as the CEO of The DNA Company, it was revealed that his neural wiring is actually genetically designed to be entrepreneurial. However, his genes also revealed a particular sensitivity to pollutants. You can see why I have him here to discuss this on the Reverse Alzheimer's Summit. Now seeing his health from this new lens, Kashif has doven even further and started to see the genetic pathways that led to his own family's challenges and the opportunities to reverse chronic disease like dementia. His measure of success is not in dollars earned, but in the lives improved. Kashif, welcome.

Kashif Khan

Oh, it's a pleasure. Good to be here.

Heather Sandison, N.D.

So, I'm really curious about how you got started. I mean, you have this incredible story of being entrepreneurial, and then you ended up in healthcare and in genetics. How did you get there?





Kashif Khan

Yeah, so it's funny, so growing up, health was always something that was important in our family because everyone was sick, right? So it was a thing that was kind of in the forefront, but my father, who passed away when I was 17, he, like, he would take me to sort of traditional Chinese medicine guys, and naturopaths, and just exploring, and I understood at an early age that there was beyond taking a pill, because he taught me that. And so I carried that with me, and as I aged and I started to see my children, and I was in a completely different industry, I built a marketing and PR company in Toronto where I lived. I started to see that I was getting sick, and the same stuff that was happening to my dad when I was young, you know, multiple conditions, and I realized I am not gonna go down that path. Like my kids are two, four, and eight years old at the time; they're a little older now. I want to be here for them.

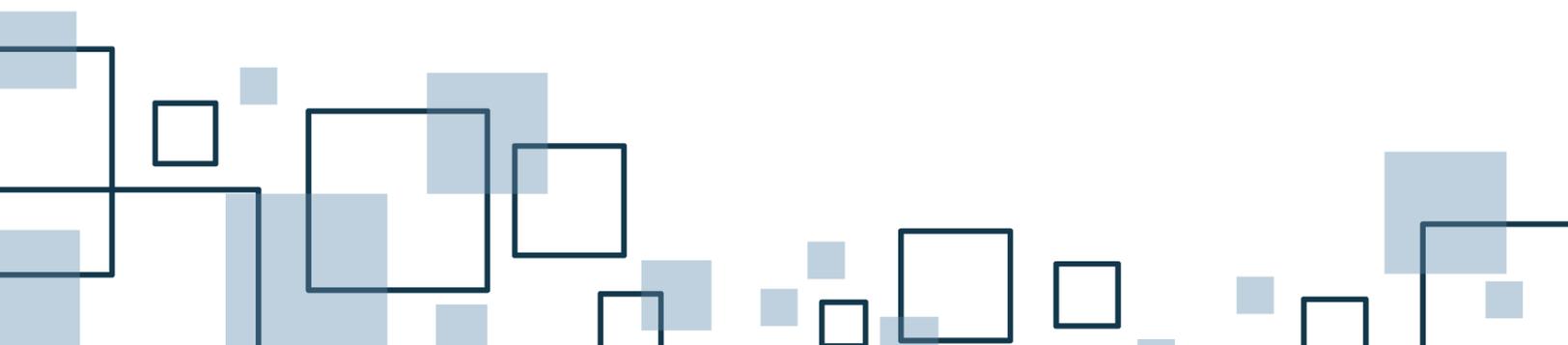
And so I literally dove in, healed myself because I was taking different pills, six different doctors, you know, everything was treated as a siloed, separate thing when they weren't. And the thing that triggered the aha moment was, in my DNA, in my genes, there's a literal page missing from my instruction manual, so that human instruction manual that's in all of our cells, and sorry I'm dragging this out, but I'll finish with this, it's that page was missing, and when I found that there's a specific set of genes that I needed to deal with environmental toxins, and I didn't even have them, forget about what version, that was the one thing that made all those conditions go away, 'cause now I knew what to do. And so I literally walked away from our marketing company, I handed the keys to my business partner. I said, "Keep it. I found what I got to work on," and I never looked back.

Heather Sandison, N.D.

Wow. And you speak to something there in terms of your relationships with your families and just being present, that I think is so just acutely relevant for our folks suffering with dementia, is this desire to be there for the generation behind you, to show up for those baseball games, and those graduations, and those birthdays.

Kashif Khan

Right.





Heather Sandison, N.D.

For as long as possible, and to really cognitively and emotionally be fully present, and so I think a lot of people listening here can relate to that in your story. Tell us about the genetic tests that you offer through The DNA Company that are relevant for somebody suffering with dementia.

Kashif Khan

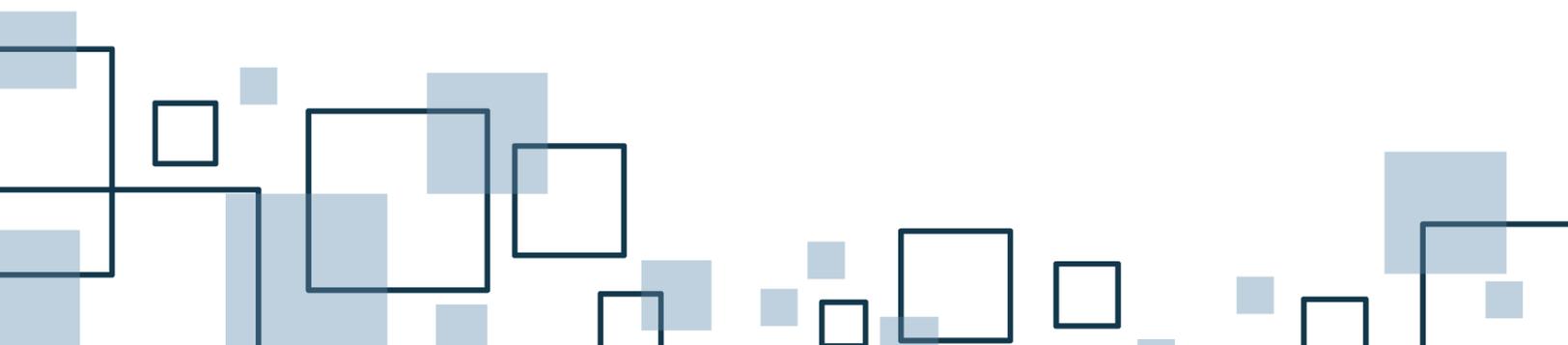
Sure, so when I first landed on genetics as being, sort of, the answer, I was firstly disappointed, because I got these results back that were, and people listening are familiar with this stuff, you got an 80% chance of Alzheimer's. What does that tell me, other than, like, I have anxiety for the next 30 years waiting to see, right? And why are you telling me, when something as precise as my DNA, that you can only get me to 80%? So what we understood is that genetics did a really good job of identifying genetic conditions, meaning that there's a specific gene switch that's on or off, and it directly equals a problem. Something like sickle cell syndrome, you have the wrong switch, you have it. You're not born with Alzheimer's, diabetes, cholesterol issues, all the big chronic conditions, which is 90% of our healthcare spend. These are things that you get over time for making the wrong decisions. So the question is what is the right decision? So that's where I learned, again, from healing myself, that this is what was missing from genetics and why I sort of funded and built this company, because I understood we were asking the wrong question. It shouldn't be, "Tell me what I'm at 80% chance/risk of." It should be, "Why do 20% not get sick with the exact same genetic profile?" It's so deterministic. These are my genes that instruct every cellular process in my body, and 20% didn't get the problem. What happened?

Heather Sandison, N.D.

Yeah, so we want to focus on what happened right with them versus focusing so much on what happened wrong with the other 80%.

Kashif Khan

Exactly. If you're in the healthcare business, it should be about how do I maintain health? What we have is a sick care industry, which we hear all the time, which is, "How do I manage the sick?" Right, so wait for you to get sick, and then mask it, and mask it, and mask it, versus let's figure out what the 20% did. So that's the research we did, and partly why we're based in Toronto, because it's such an ethnically-diverse city and it's fairly large in terms of Canada, and so we studied the environment, nutrition, and lifestyle habits of the 20%. You have the same bad genes that put you at risk, but you didn't have a problem. What did you eat? How did you exercise?





What were the exposures? And then we mirror that against the environment, nutrition, lifestyle habits of the sick. What were they doing wrong? And then you get a very clear answer, so that anxiety of, "I don't want a DNA test 'cause I don't want to know if dementia's coming," versus here's why it may come and here's exactly what the 20% did to not get it.

Heather Sandison, N.D.

That's empowering, right? And so tell me a little bit more about your personal story. So you found out that there was a page missing in terms of how you detoxify, and on this summit we're talking a lot about toxins and a lot about how to get rid of them. And unfortunately, you know, this can get kind of depressing because we live in such a toxic world, but when you have that empowerment of, like, "Okay, something's not quite working for me. This is what I can do about it."

Kashif Khan

Right.

Heather Sandison, N.D.

What was your process around that?

Kashif Khan

So, when you have, say you have a genetic weakness let's call it, you either have a bad version of a gene, or you're missing a gene, but it's not a genetic condition. It just points to bad cellular function. Meaning that if you do the wrong thing, you might eventually get sick. You have a couple choices. You can either increase capacity, which means eat the right stuff, take the right supplements, which a lot of it has to do with, to increase that gene that's not doing a good job, right? Make up for it. Or reduce the input of the wrong stuff, that because you have the bad version of the gene, you can't handle. Or maybe a combination of both.

Heather Sandison, N.D.

And hopefully both, exactly.

Kashif Khan

So that's the ultimate, but a lot of people can't handle that all or can't maintain it, they can't comply. So do what's easier for you. So it starts with knowing what those choices are, and to give





you an example using myself like you asked, so the glutathionization process is very, you know, glutathione is in your blood binding onto toxins, sending them to the liver, metabolizing to get rid of them. It's kind of like when you drink alcohol, everybody already knows your liver cleans that up. Well it cleans up a lot other things, too. So in our office, I used to get these crazy migraines, this is before I discovered all this, to the point where the only thing that would heal me was I would have to vomit from the pain, 'cause you know the brain and the gut are connected, and the body would be confused and thinking, "Okay, go ahead, vomit. I'm healed," and then I'd go to sleep and crash. My business partner would then drive me home. And this happened regularly.

And one day I asked myself, "Why doesn't he have this problem? We're the exact same age," right? And it was in my genetics and I discovered that the GSTT, GSTM, GSTP genes, your glutathione genes, of the GSTT1 and GSTM1, and we're gonna actually put some focus here, 'cause that whole, "How does the gut and brain connect and how does that lead to dementia?" There's really good stuff to know here, I'm missing, forget about what version, I don't even have them, right? So I don't do this process, in terms of things that I breathe in and things that enter through the gut, kind of the two main areas, other than your skin, where things enter your body. So what did I find out, was that in our building, in the basement, there was a manufacturing company that was pumping chemicals into the air, right? But why did I have a problem and he didn't? Because he had an extra copy of this gene.

Forget about having the normal version; he had an extra copy. It's something called a copy number variation. So people listening here are probably more in tune with testing and you've heard of a snip, a genetic snip, which is like that spelling mistake, that's literally a spelling mistake in a 20 thousand letter-long gene versus you don't have the gene. Copy number variation, the whole thing is missing, or you have a extra copy of it, so now that process is being done twice as much. So that's what I discovered, that he had an extra copy, I didn't even have it, so now look at the outcome: crazy migraines to the point where I vomit, don't even notice.

Heather Sandison, N.D.

Wow.





Kashif Khan

With the exact same environmental exposure. So imagine if I stayed there. Right, imagine if I stayed there, and I just suffered through it. "Meh, migraines, I got to take a pill. It's what I do," right? That's the belief. What would have happened to my cellular health? The damage of not clearing those toxic chemicals, the neural inflammation that could eventually lead to something like dementia. So to answer your question, sorry, what did I do about it? Is I understood what I couldn't deal with, and I first of all eliminated those things, but I also started to supplement heavily. It's sort of a, kind of like an emergency, like heavy, heavy supplementation. I mean, clear it, let's get rid of everything, and then a maintenance protocol to make sure that what I don't do genetically, I'm making up for with supplements.

Heather Sandison, N.D.

And then this starts to get pretty complex in DNA, sometimes it's like that, but if you have, say, a missing copy of a gene, or a copy of a gene that isn't functioning, a variant we'll call it, not a mutation, but like a variant, that means that you don't detoxify as well, or you don't, you know something doesn't work quite as well in your system, maybe you create more inflammation, like in the apo E44 genetics, you create more beta-amyloid plaque. And so then when you start to layer this on top of other things that put you at risk for dementia, then all of a sudden we have, like, a perfect storm, where maybe-

Kashif Khan

Yeah.

Heather Sandison, N.D.

One person will get MS, or somebody else will get dementia, or somebody else will get autoimmune disease, but now that we have these layers of, not optimized function, then that's when this manifests as chronic disease. So understanding what we're kind of set up for, and doing something about it before it happens, puts us in the optimal spot.

Kashif Khan

That's exactly it, is that all these things layer and stack, and then they compound on each other, and then eventually there's that threshold. You body's resilient, right? It's coping with all this stuff, but you get to the point where it's too much, and then that one catalyst, the thing you ate, or something like COVID for example, a very powerful trigger that takes metabolically-unhealthy





people and puts them in the hospital, who didn't know how unhealthy they were, right? So it's that trigger that takes you over the threshold, that line where it's too much.

Heather Sandison, N.D.

Mm hmm.

Kashif Khan

And so going back to the gut, 'cause you mentioned it, there's a gene called GSTM1 which really determines how well you have that first line of defense in the gut, and there's so many people that talk about the inflammatory load caused by that sort of, something as simple as eating hummus. People think, "Oh, it's healthy." Yeah, but they use chemicals to dry the chickpeas in order to ship them, in order to store them so that they last. Those chemicals are highly toxic, potent, potent toxins. Again, some people, no problem. Some people, "Hey, every time I eat hummus I get bloated," because those toxins in your body can't clear, cause that inflammatory load, everything goes crazy, the microbiome goes nuts, and all of a sudden, that leads to a bit of leaky gut, and that leaky gut leads to toxic substrates in the blood, and those toxins then get to the brain and they can cross the blood-brain barrier, and now all of a sudden there's neural inflammation. That then leads to what we're talking about today. So all of these little pieces, if you're doing four, five, or six of them, you're gonna just get there a lot faster so you have to know about everything.

Heather Sandison, N.D.

Well yeah, and that can start to feel a little overwhelming, right? But we're applying a complex system science approach. There's a lot of interconnected pieces here, and if we start to leave them out, then we get conventional medicine, right? Where it's like one pill for one ill, and it just doesn't work. And so when you we get to put the pieces back together, when we start collecting data in a way that's meaningful, and accurate, and works, then we can get this improvement in otherwise impossible to cure or impossible to reverse diseases, which is super exciting, and what I love about what you guys do is you make it digestible, right? You guys do this incredible work using the DNA, but you also present it in a way that isn't so confusing for people. So talk a little bit about that.





Kashif Khan

Yeah, so that's one of the things that I found personally when I first started exploring this whole genetic world. It was so hard to use, meaning that, remember, genetics is built by geneticists, who are scientists and PhDs, who do a really good job of studying things in a lab. They're not really good at talking to people and helping people. That's not their job so they don't have to think about that. So the products that we use to get, the reports, were designed for them. Here's a bunch of data that needs to be interpreted. You've got this version of this gene, this version of this gene, this version of this gene. Now they understand how those things correlate in the maps and all that, but to the layman, it's like, "What is all this gibberish?" So that was my experience, and I realized that all I needed to know was what's wrong and how do I fix it?

Heather Sandison, N.D.

Right.

Kashif Khan

Right, that's it. That simple, and maybe even a third layer of once I know how to fix it, how do I actually stick to it, like what are the behaviors I need to adopt, that habit change, right? So I've thought about how would I want this, and then by the way, the other thing we did is I actually spent three or four months interviewing 80 different doctors to ask them, "Tell me what's wrong with genetics." And they all kind of got to the same thing, is, "I don't have time for it. My staff doesn't, they're not interested, I can't do the training and the courses," and it kept coming back to the same thing is that interpretation, interpretation, interpretation. The product, the report is really what you're getting, not a test.

Heather Sandison, N.D.

Hmm.

Kashif Khan

It should be easy to use, and that's the whole point, so when we built the reports, we realized we had to build an AI, an artificial intelligence tool to program as per what you're thinking. Should I be on a keto diet? Anxiety, addiction, body type. Think about sleep, why can't I sleep? And not just why can't I sleep, why can't I fall asleep, why can't I stay asleep, why do I sleep through the night and not feel right? Those are the things people are actually worried about.





Heather Sandison, N.D.

Right, right.

Kashif Khan

Including myself, so I built it from day one thinking as the layman that I was, here's how I wish it was. And I argue now that you don't need anyone to interpret it for you if you've delivered it the right way. That's the whole point: make it easy to use. That's what we've done.

Heather Sandison, N.D.

So then, what I'm hearing, to kind of cut the doctor out, so can patients come directly to you, get their DNA tested, and then get that report, or do they need to have a doctor there with them?

Kashif Khan

So there's kind of two answers to that. You don't need a clinician, meaning that the reports that we provide, you can understand them. We have tons of people that email us saying, "I can sleep at night finally. I feel better, my fibromyalgia," whatever their dealing with is just better. At the same time, there are certain things that we cannot say directly to a consumer. So there's certain recommendations that are more clinical and prescriptive in nature, and we have a separate report that, if it was ordered through a clinician, we provide only to the clinician. And what is it? It's the same information, but reinterpreted for the red flags. "Here's where you need to focus," with really, sort of powerful recommendations that are personalized for that problem. So we can't give that to the patient, because they are not our patient. So unless we were to go open a clinic, which we have no intention of doing, it's clinical-level information. So there's kind of two things: people come to our website and buy a test, they learn and they fix, and some people go through their functional medicine doctor or integrative doctor and they get a little bit more.

Heather Sandison, N.D.

And that sounds like also a great way to keep it safe, so that make people sure that if there's interactions with what they already know, or medications they're already on-

Kashif Khan

Exactly.





Heather Sandison, N.D.

That would be just double-checked and triple-checked through a provider who's been well trained for that.

Kashif Khan

Exactly.

Heather Sandison, N.D.

So then tell me about somebody who's already done, say, 23andMe, or Ancestry.com, or they've looked at their DNA through some sort of lens 'cause they're already curious, do they then do your test as well or is there a way to use existing data? How does that work?

Kashif Khan

Yeah, so there's a bit of a challenge there where most of these genetic tests... So here's a dirty secret of the genetic testing industry, and most people know this already, the genetic testing industry is not designed for the consumer; it's a data-selling business.

Heather Sandison, N.D.

Right.

Kashif Khan

So when you, as a consumer, go buy most genetic tests, the product that was designed wasn't with the interest of what do you need? It was what data does the guy that's paying me \$5,000 for a dataset versus the \$200 you're paying to buy the test? What do they need?

Heather Sandison, N.D.

Mm hmm.

Kashif Khan

Because that's the windfall. And so these tests are designed for data collection, and that's when you get the report, it's a bunch of genes. This gene means this, this gene means this, but that's not the way the body works. It's not 22,000 independent genes, which is how many genes you actually have, doing independent things; it's systems. There's a cardiovascular system, there's neural pathways, chemical path-, there's hormone pathways, they're already determined. So





when we get data from those tests, they don't work in our AI, for two reasons. They don't test for what we test for. So you remember in the beginning we talked about the snip, that spelling mistake in the gene? That's one type of variation. We also test for what's called an insertion or deletion, an indel those are called, meaning that a whole paragraph is missing, or there's an extra paragraph. So imagine if the snip is that impactful that they test for it, how much more does it mean that there's a paragraph missing? Or we also test for what I spoke of earlier, a copy number variation, whole page is torn out, you don't even have the gene, or you have an extra copy of the gene. So without that information, we can't give you our reports. Second thing is, the pathway of our system interpretation. So as opposed to a bunch of independent genes, we look for things like hormones, which don't mean much on their own. You have to look at the system, the pathway. And so there's some things that can inform, so kind of 60% of what we tell you, but to get it from that, "Hey, you got an 80% chance of Alzheimer's," to "Here's 100% how to avoid it," you need to test for more, and that's what we do.

Heather Sandison, N.D.

So then what about your company? Do we need to be worried about you selling data somewhere? Is that part of your model?

Kashif Khan

Yeah, so this was a big, sort of, decision because it is very lucrative to do that.

Heather Sandison, N.D.

Mm hmm.

Kashif Khan

Right? In 2019, 23andMe got funded \$300 million dollars by GlaxoSmithKline, then you wonder why, right? Why do they invest \$300 million dollars into them? So we could have easily gone down that path, but what we said is that we actually see an opportunity, because when somebody hands over their DNA, their belief is you're gonna mind that for me and tell me everything I need to know. That's the expectation. They're not getting that, they're underwhelmed and they can kind of shove it in a drawer and don't look at it again. So we said we can be those people. We can be the people that do such a good job of interpreting it that you're gonna stick with us, for coaching, for supplements, for other things and we don't have to be a data-selling business. We can be a service company that helps you with everything else you





need because we understand you at the genetic level, and that's exactly what's happened, is people got their DNA, they get their reports, and then they come back and say, "Hey, I need to lose 10 pounds. What's the best way to do it?" "My mother had breast cancer; I'm worried about that. Can you look at my DNA and figure that out for me," and we start to help them build these programs and get them better, and we've gone so far down that path, that data selling isn't even a thought.

Heather Sandison, N.D.

Okay, and then so what about security? I know a lot of my patients will say, "Well, I'm worried that somebody's gonna know about my DNA, and then I'm not gonna be able to get insurance, or-"

Kashif Khan

Yeah.

Heather Sandison, N.D.

"Somethings gonna happen down the road," do you have any thoughts about whether or not people should be worried about security on that end?

Kashif Khan

So it comes back to the same thing where, if you're in the data selling business, everybody's your customer. Anyone that's willing to buy, that includes police forces, government organizations, insurance companies, whoever's willing to pay 'cause you've signed consent; your DNA is for sale. So again, to the same point where we send out our tests as a what's called research use only, meaning that it's not a data collection and selling tool, it's something that we use collaboratively with the patient to research for them. Luckily, in Canada, there's more laws and protections around people using DNA to make decisions, for example, insurance companies aren't allowed to do that. So yeah, so we've taken that path where, by acknowledging that we don't sell data, all of that is sort of out the window and not possible anymore.

Heather Sandison, N.D.

Got it, and if I'm hearing you correctly, people can be sort of assured that if they use your company, that their data won't be sold and that there won't be issues around security, around it getting out. What about your database? Do they need to be worried about that being hacked?





Kashif Khan

So yeah, same thing, our database, it's all anonymized, aggregated. So we've been very careful to... So we actually did something really interesting. One of the great things that I really enjoy about what we do and how we built this company is the people, our team. So in every aspect of how we grew, we found the best person that we could to do that thing, and I'm humble enough to acknowledge all the things that I'm bad at, so including technology, security, all that stuff, so we've found a gentleman who actually was the head AI architect for IBM.

Heather Sandison, N.D.

Oh, wow.

Kashif Khan

Yeah, he was also the Chief Technology Officer for a hospital system, a bunch of hospitals somewhere on the East Coast, so he had really cool healthcare experience because he ran these whole bunch of hospitals' technology and security, and he was the AI architect for IBM and he led a big team there. So we asked him, "What's next in life for you?" And he said, "I don't know," and we said, "We know," and we asked, "Can you join and help us, bring your knowledge," so he actually built all of that. So he built our data security, and the test was Royal Bank, which is Canada's largest company, I think there's something like 80,000 employees, we are working on a project with them, and the test was can we pass their security protocols? Because you can imagine how important employee data is to an organization that big, and we did. So it took us one year of building, building, building and now we're officially a vendor and we work with them, so it was a big milestone for us. It sounds dry and boring, but it was a lot of fun.

Heather Sandison, N.D.

Congratulations, yeah, I can relate to that, like building, building, building, and creating, and iterating, and making sure that you're just... What I hear from you is this commitment to doing it better, doing it with integrity, doing it to serve-

Kashif Khan

Right.





Heather Sandison, N.D.

And I think that that's what comes across and what feels so exciting about what you guys have to offer.

Kashif Khan

Oh, thank you.

Heather Sandison, N.D.

So, if someone wants to learn more about The DNA Company, how do they find you guys?

Kashif Khan

So for the purpose of what we're doing today, we created a link that people can go to to get a discount, which we don't normally do, so if you go to our website, there's a retail price, I think it's \$400 for the test, and if you just go to TheDNACompany.com, so TheDNACompany.com/RAS, which is the summit, right? R-A-S, then anyone attending the summit, when you get to the checkout you'll see a discount built in. And in terms of what you get, we believe that there's sort of six core systems, and this is after studying people, and one thing we never mentioned that I should, our research model, which you asked about earlier, is we said, "Instead of studying DNA, let's study people." There's enough information about DNA out there already. We can go look at publications and pull them and just interpret them better. So we said what was missing was the humans.

How does this actually apply? And so we spent three years studying 7,000 people, which is the largest study of its kind in the world, we met literally 7,000 patients with their health story in one hand and their genetics in the other hand and understood how those things come together. So because of that, we learned what the main things are that people need to know, and over, and over, and over again, when it came to, "I want to be the best version of myself. I want to add 10 years to my life, and 10 healthy years, how do I do that?" It came down to six things, cardiovascular health, which affects 50% of people, which in a big way includes what we're talking about today, which we can touch on if you like. Hormones, which is how do I put on muscle, how do I burn fat? Hair, skin, which speaks hugely to longevity. How do I have vitality as I age versus frailty? Diet and nutrition: keto diet, vegan diet, paleo diet, low carb, high carb, what am I supposed to do? Why does that person have diabetes and that person doesn't? So everything about the genetics of nutrition, for you as a personalized individual is in there, then



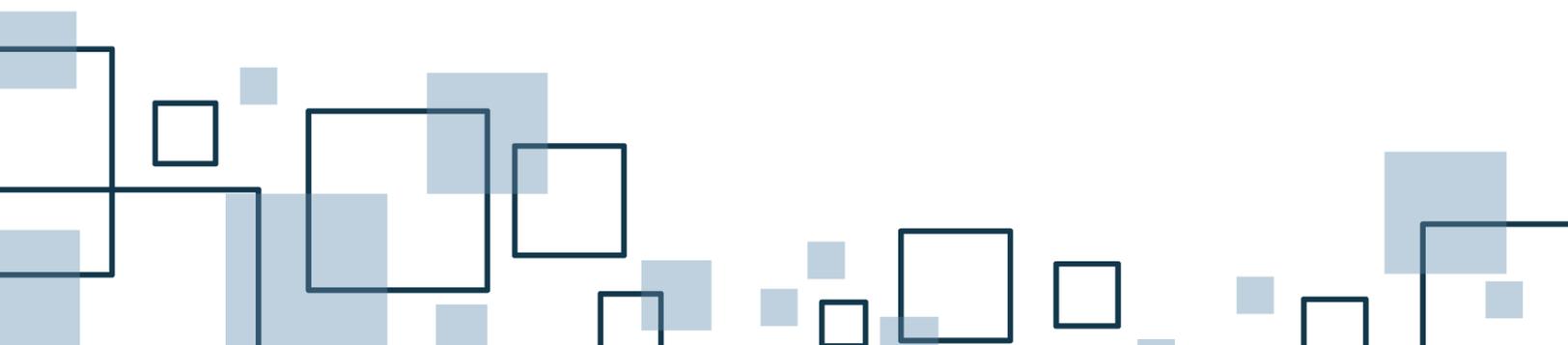


mood and behavior, which is probably the biggest report. It's everything from addiction, to anxiety, and I'm gonna actually give you an example to show you how this works maybe, and I'll use mood and behavior as an example. And then, cellular health, immunity, detox and immunity, so how do you detoxify, how do you methylate or deal with inflammation? How healthy are your cells and what do you need to do to make sure there's no inflammation, which is a root cause of disease? And the last one is sleep, which we built unintentionally. We didn't actually think of sleep as a genetic issue, but what we realized is as we were healing people, one of the things we kept hearing was, "I sleep better now." So it was an unintentional outcome. We realized that the things that we were doing with them genetically were either helping them fall asleep, stay asleep, or sleep through the night and feel better in the morning, which these were the kind of three buckets we found. So those are the six things that people kind of go through, and within each one of them, there's all these micro things that we look at, and then you come out the other end a new version of yourself.

And I said I would give you an example using mood and behavior, so, again, using myself as the guinea pig, when you think of neurochemicals, in our report, there's a section that talks about addiction, that talks about anxiety, that talks about depression, and these seemingly are three different things, but they're kind of all rooted and bundled up from the same neurochemicals. So dopamine is a chemical that allows you to feel pleasure, but it also allows you to feel reward. "I did something good at work," or "I ate some tasty pizza," one of those two things. In order to experience that, you have to bind it. So there's these receptors in your brain, and there's a gene called DRD2, which determines how dense those receptors are, how many do you have? Then there's a gene called MAO which comes along and breaks the dopamine down, 'cause you need to get back to normal eventually. Then there's an enzyme and gene called COMT, which comes and sweeps it away. It's like the broom, which also does this for hormones, and you know very well it does it for multiple things. It also helps in methylation. So I have the lowest version of DRD2, so the very sparse, least density of receptors, so I don't really feel the dopamine. I had the fastest MAO and the fastest COMT.

Heather Sandison, N.D.

Oh, my gosh.





Kashif Khan

Like feel it way down here and it lasts that long. So I'm a prime candidate for depression, and guess what, all three outcomes, I've had all three: depression, I've been depressed; addiction, because I go down the pleasure route or achievement, because I go down the reward route. And why did I have all three? This may be the most important thing we talk about today is context. Your genetics are what you're capable of. Your outcome is the load you put on your genetics.

Heather Sandison, N.D.

Right.

Kashif Khan

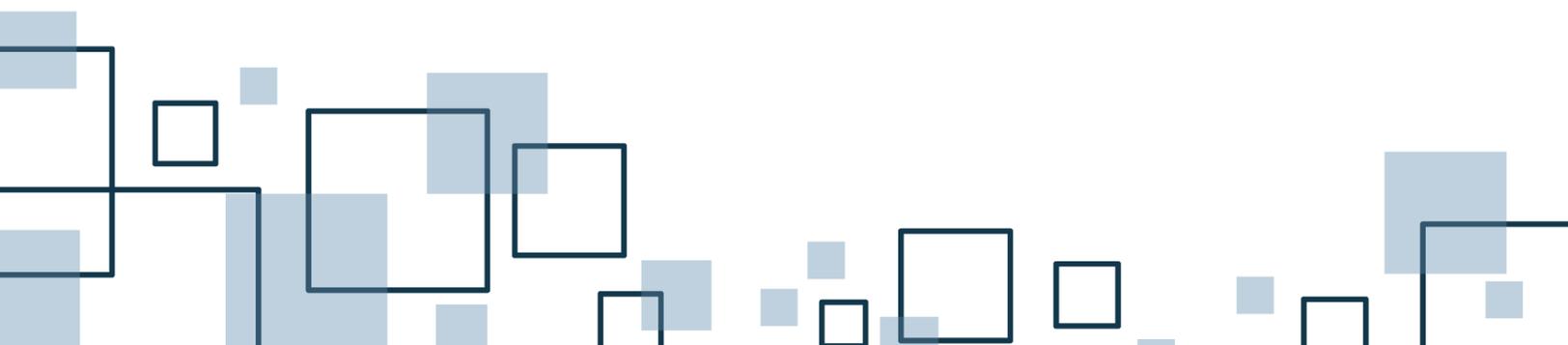
The context, not only your environment, nutrition, lifestyle choices, but even where and who you're with. So again, using myself as an example, when I was younger, I grew up in poverty, working hard, but parents weren't well and my father, like I said, was sick a lot. So I was constantly not really that motivated, didn't think so highly of myself, and became addicted because a friend showed me something, for my birthday, that I ended up smoking, and got hooked on it. So that led me down this addiction path in my teens. What shifted gears was my father died when I was 17, and all of a sudden I became responsible for my family and I had to work. And then I went down this reward path. I started working and working, and whatever I did yesterday wasn't good enough anymore because I don't feel it. And I built a business I didn't even realize I had built. Then, when I one day sat back a few years later, I was like, "Oh, I have, like, people that work for me, and I make decent money, and I can take care of the family," so I sort of had become a little complacent.

Heather Sandison, N.D.

Mmm.

Kashif Khan

That's when I became depressed, because I was avoiding the pleasure, addiction, and I wasn't getting the reward, so I didn't want to get out of bed in the morning. I didn't go to work, I felt depressed, like there's no point to all this. And it wasn't until I understood genetically how I was wired that I don't have any of those problems now. Reward, great, I still work hard, but I now manage it, and I'm not addicted to work, but understand that this is why the, "You have an 80% chance of Alzheimer's" is so not true. There's the genes that drive the processes. That gives you





risk. Everybody has risk; you just have greater risk. Now your environment, nutrition, lifestyle choices are the load that can take you from healthy to sick, and then the context you're in will drive your choices.

Heather Sandison, N.D.

And this is a brilliant illustration of epigenetics, is what we say in the industry. So if you've heard the word epigenetics, what Kashif is describing is that. It's that your genetics kind of... The analogy I use is like you have plans for a house, the architect has drawn the plans, and that's your DNA, that's like the coding, or the instructions, like what you said, for how to build that house. And then how that house manifests, like does it have carpet, or wood floors? Is it by the beach or in the mountains? Does it have a happy family in it or a sad family in it? So, is it tile? What color's the paint? All of these things are the epigenetics, so how it actually manifests in the world, or the phenotype, is what you're describing, and that there's this interaction between them. They're both really, really important, and then how we optimize for those instructions, is what really... That's what matters most when it comes to how great our experience of life is.

Kashif Khan

Yeah, that is your net result or your outcome. And this is exactly why we say that if you're born with risk, you weren't born sick. You could have the worst cardiovascular profile in the world, but you can live on a beach eating fish out of the sea with no stress and great sleep, you're not getting sick. You have to put the load on your... All we're saying is that there's more risk, so you need to focus and pay attention on that area, that red flag. So your genes will tell you where to focus. Of if you're already sick, they will tell you why and what to do about it, as opposed to just taking a pill to mask it. If you start to make the right choices, not only can you prevent, but you can also reverse disease, which is exactly what we're talking about, right?

Heather Sandison, N.D.

I was just gonna say that! That's exactly why we're here together is because what you're describing are the tools, and it's also the narrative. It's so consistent with our story, that if you understand why the disease process is happening, if you understand what set you up for that, or what's about to set you up for it if we're in prevention mode, which is such a luxury, then you can make empowered decisions to reverse or prevent a chronic disease from happening and taking place. Versus being in a neurologist's office being told, "There's nothing we can do. Get your





affairs in order. I'm so sorry, but this is gonna be torture until it's over." Just preventing that suffering is I think it's why you and I both show up.

Kashif Khan

Yup, exactly, I see it every day, and I just... The pain that we feel every time somebody comes to us with their parent, or their uncle, or whoever and they've been told that this is just, it's happening, right? Get the family ready. And then we're able to stop it in its tracks? And they're like, "Why, how did you? Our doctor-" Yeah, your doctor, they're not armed, and it's not really they're fault.

Heather Sandison, N.D.

Right.

Kashif Khan

We have an acute care system that does a really good job of masking problems. You go to the hospital with a broken arm, they're gonna fix it, but that same toolkit is applied to chronic disease. Wait for it to happen and then fix it, which is the wrong way to deal with chronic disease. You should never have it in the first place if you understood why, and that's the number one question we don't ask: Why? Because that's not in the toolkit. We don't deal with the why. We only deal with the what, like how do I mask whatever this thing is. And the why, again, is not the same for all of us. This is why genetics are so important because, do I focus on my gut, do I focus on insulin, do I focus on toxicity? Maybe a little bit of everything, what do you actually need to do?

Heather Sandison, N.D.

And dementia is just like the classic example of that, right? Like, well we need to know, and if it's an issue for you, if your insulin regulation, your blood sugar is an issue, then yes, we need to focus on that, but if it's not, then we need to look at hormones, or traumatic brain injuries, or toxic burden, and those things can all be impacting how your DNA expresses itself, and what disease manifests, and how you get out of it. What is the toolkit that we need to put into place? What is the plan we need to put into place to optimize all of this?

Kashif Khan

What you just mentioned made me think of something. So there's a family up here in Toronto that runs something called the Women's Brain Health Initiative. I don't know if you're familiar





with them, but they're a Canadian organization, they're funding research, and what they're saying is that 80% of the research dollars for Alzheimer's and dementia are spent on men. 80% of the sufferers are women, right? That's where the cases are, and we're assuming that women are men with different reproductive parts. That's medicine. Versus why is this happening? So you spoke of hormones. What do we see over, and over, and over, and over again? Why is it that 66% of women will die on their first cardiovascular event and most men will actually survive? Why is it so much worse for women? And there's no previous symptoms, no warning signs, heart attack, died, 66% of women they get it. Same thing with Alzheimer's and dementia, why is it so much worse for women? Well, women are more estrogenized than men. We already know this. Not all women. So some women in that hormone cascade, progesterone, converts it to testosterone, and then becomes estrogen. Men do that daily; women do that monthly.

But it doesn't end there. The estrogen, before you clear it, becomes a metabolite. All right, there are two, four, or 16 hydroxy estrogens is what they're called. Two is great, clean and healthy, that's what you want. Four and 16 are toxic, 16 being more toxic than four. If that's what you do, you convert your estrogens in- First of all, are you estrogen-dominant, where the gene that tells testosterone to convert into estrogen, you have a fast version of the gene, so that estrogen pool is just a lot more heavy? Which that would be the woman with bigger curves, nice skin, nice hair, right? Or the more androgenized, or testosterone-dominant, women that doesn't convert into estrogen well, slimmer frame, kind of like yourself, more chiseled jawline, features are obvious, that's more androgenized, right? So now the woman that's more estrogen-dominant, if she's also converting into an estrogen toxic byproduct, and then, guess what, when you're menopausal, you don't have a monthly cycle anymore to get rid of it, what does your body do with this metabolite? It stores it in fat.

It tries to keep it away from your organs. Where your brain is made of fat, you know? So these toxic metabolites that are free-flowing through your blood, which you no longer have a menstrual cycle to clear, but you're still producing, all of a sudden causes that additional- This is what we talked about, that threshold, how many things, how many fronts are you fighting? For women, there's this additional load that men don't, for the most part, have to deal with. Some men do, but for the most part they don't, which is why women just do so much worse with this particular condition. So again, remove that, and look at the load you just took off.





Heather Sandison, N.D.

And it's really, I think, about balance, as well, right? Because women also, they have the estrogen and progesterone production, and then they drop off a cliff with a menopause.

Kashif Khan

Right, right.

Heather Sandison, N.D.

And that impact on the brain can be a really- I mean so many women that I talk to are like, "My cognition, that started to decline when I went through that menopausal transition. That brain fog I haven't been able to get rid of it since I turned 50 and stopped getting a cycle." And there is a lot of good literature saying that we should actually be replacing estrogen, and progesterone, and testosterone for our women who are post-menopausal for brain health, for bone health, for that vitality that you were talking about, and, to your point, we need to make sure that you can metabolize it and get rid of it so that it doesn't accumulate in a toxic neuroinflammatory way. So really working with a good provider, having that great data from whether it's DNA, or serum, or urine, or saliva, or wherever you're getting it from, understanding what's going on in the system so that we can optimize, again, optimize function, get the right signals into the cell, get the wrong signals out. Like you mentioned with toxins, you want to make sure you can get rid of it and you want to stop it from coming in, so just creating that balance at a cellular level, I think, is the goal.

Kashif Khan

For sure it is. Finding that optimal place for yourself, turning those dials, either improving capacity or reducing the insult, whatever that toxic thing is that's causing your problem, you find that balance and you're just gonna be a different person.

Heather Sandison, N.D.

It's amazing, it's so exciting. Such an exciting time. We were talking before we started recording that just how fun it is to be able to think outside the box because the box isn't working, we're not getting solutions for things like dementia, so we have to get outside of it, and it's this really fun exploration. I get to meet really incredible, inspiring people like you, and I'm just grateful to be on this journey accompanied by you, working so hard to reverse irreversible diseases and really shift





the health of everyone we touch. So, Kashif, thank you so much for joining us and spending your time today.

Kashif Khan

No, thank you. What you're putting together here for everybody is incredible. It's a blessing to so many people because people don't have this information. They just think, "This is what I got, and I'm taking a pill and it's gonna get worse," but you're helping so many people. This is amazing.

Heather Sandison, N.D.

So one more time, let everybody know how they can find you guys.

Kashif Khan

Sure, so go to TheDNACompany.com. The test is called The 360, the one we're talking about. There's other products there like coaching, and supplements, and things like that, but what we're talking about, the core foundational test, is The 360. So TheDNACompany.com/RAS.

Heather Sandison, N.D.

The Reverse Alzheimer's Summit.

Kashif Khan

Exactly, and then at the checkout, you'll see a discount built in for anyone that's attending the summit.

Heather Sandison, N.D.

So generous of you. Thank you so much.

Kashif Khan

Pleasure.

Heather Sandison, N.D.

Yeah.

