Reverse Autoimmune Disease Summit

Dr. Keesha Ewers Interviews Dr. Dale Bredesen

Dr. Keesha: Welcome back to the Reverse Autoimmune Disease Summit. I'm Dr. Keesha Ewers and I'm really delighted to bring to you today a conversation with Dr. Dale Bredesen. So Dr. Bredesen's career really has taken him through a wide notoriety and familiarity with Alzheimer's disease, which is what we're going to tease out a little bit today. He's an internationally recognized expert in the mechanisms of neurodegenerative diseases and his career has been guided by a simple idea that Alzheimer's as we know it, is not just preventable, but also reversible. Also the name of the Summit. All of this is reversible thanks to a dedicated pursuit of finding the science that makes this a reality. His idea has placed Dr. Bredesen at the Vanguard of Neurological Research and led to the discoveries that today underlie the Recode Report. He's also the author of the bestselling book, The End of Alzheimer's. So you have a very wonderful resume, but I'd like to actually dive into this conversation and have you talk a little bit about that. Like, what led you to this passion of yours that has led to such an amazing contribution to our understanding of neurology?

Dr. Dale: When I was a freshman in college at Caltech, I got very interested in the brain and its relationship to computers how the brain works versus how computers work. And of course, as I started to learn about the brain, I got interested in brain diseases. I was surprised to learn that this is the area of greatest biomedical therapeutic failure. As they say, everyone knows a cancer survivor and no one knows an Alzheimer's survivor. We had the laboratory for 30 years and we studied the basic mechanisms of neurodegenerative process. What is the molecular biology of the process? And the whole idea was, could we understand the fundamental nature of this process of neurodegeneration? Why is it so common? Why is it so difficult to treat so that we could begin to think about the first effective treatments? Could we really get under the hood and see how this works? So that's what got me interested in Alzheimer's and other neurodegenerative diseases.

Dr. Keesha: I'm so glad that you did and I have wanted to really dive into this conversation as I have a lot of patients that come to see me, they've done a lot of reading. Now there's Summits out there on brain health and books on brain health. And luckily it's gotten people's attention and they're starting to finally think about the brain as an organ that needs to be taken care of as much as, if not more the heart. Right? And that's always been the heart is the one that everyone thinks about when they think of health. And so that's good. But then there's also some misunderstanding out there about what causes Alzheimer's; what Alzheimer's actually is, the difference between Alzheimer's and dementia. And then why you're here is because of some of the autoimmune connections to all of this. So let's start with what Alzheimer's disease is.

Dr. Dale: Of course the heart without a brain does not do you a lot of good. So I'm glad you asked about Alzheimer's because you know, this is one of the issues Alzheimer's is just a name of a professor who published the original work in 1906. So when you tell someone, Oh, you have Alzheimer's disease, that's like telling someone who brings their car in. Oh yeah, you have car not working syndrome. It really doesn't tell you what is the problem. And when people ask, well, so why did I get this? Well, it's Alzheimer's; we don't understand it. So that's what the research taught us. What's actually driving the process? And so Alzheimer's is a form of dementia. So just like saying a migraine is a form of a headache dementia is global cognitive loss.

Dr. Dale: People often have trouble with their memories, although not always. They have trouble with planning executive functions. They have trouble with word finding. They ultimately as you know, have trouble dressing themselves and caring for themselves. So global cognitive loss is dementia. Within that there are a number of causes, but the most common one is Alzheimer's and it affects about 5.8 million Americans currently. But you know, I think that's a little bit misleading because what you really want to know, I mean obviously many people like you, you're too young to know whether you're going to get Alzheimer's yet. And the same for my daughters and things like that.

Dr. Keesha: I'm 54. I'm old enough to know.

Dr. Dale: You're still, with respect to Alzheimer's, you're a youngster, I should say. When I was training, which was back in the eighties in neurology, we never saw people in their fifties unless they had the rare mutations, familial Alzheimer's disease, which is less than 5% of Alzheimer's. Now we see 50, 51, 52 year old, more women than men all time. It is so common. And I wrote a paper on this a couple of years ago and suggested that there are at least a half a million people in the United States who have this different kind of Alzheimer's, which is a toxin related Alzheimer's. And we think that that's probably a gross underestimate. So the bottom line to answer your question is Alzheimer's is one of the forms of dementia, but the description is pathological as you know. So it's simply saying in your dementia, you have some amyloid plaques and some tau tangles, but we don't know what causes them. So our research showed that there are specific contributors and in fact most people have more than 10 of these. So again, Alzheimer's is simply a kind of dementia, a very common one, to find pathologically. And I should add, if you look at all the people living today, how many of us will get Alzheimer's? About 45 million in living in the United States out of the 323 million or so of us. So incredibly common.

Dr. Keesha: And that's an increase isn't it; from what we used to see 10, 15, 20 years ago.

Dr. Dale: Yes, it continues to increase. And professor Christine Yaffe from UCSF wrote a paper a couple of years ago where they looked at serial autopsies and concluded that it is now likely to be the third leading cause of death after cardiovascular disease then cancer, then Alzheimer's.

Dr. Keesha: And in all three of those we're finding auto-immune connections. When I give talks, from stage I will say, it's the fourth leading cause of death, auto-immunity in women in the United States. But then if you start to tease out what the leading causes are, and you look at those auto-immune connections and you kind of jumps right up to number one; that autoimmunity actually is because we're finding autoimmune connections to heart disease now. So what is that auto-immune connection to dementia, to cognitive decline to Alzheimer's?

Dr. Dale: Yeah, that's a really great point. And actually not a terribly simple one. As you know, the immune system is turning out to have links to all sorts of diseases as you indicated. Cardiovascular disease, cancer, common issue of course, Hashimoto's and all the various autoimmune diseases, Lupus, et cetera. And yes, Alzheimer's as well. In Alzheimer's, the immune system is actually really interesting because you have this chronic activation of the innate immune system. So you've got this ongoing inflammation in many people. But of course under normal circumstances you have the innate system activated which is the nonspecific piece and then you get this beautiful hand off to the adaptive system, both cellular and humoral. And now you have a normal phenomenon where you clear the antigen, you cleared the pathogen and you reset everything in Alzheimer's. Unfortunately you don't get that to happen

Dr. Dale: For some reason and we're still trying to understand this completely, but what happens is you have a chronic innate system activation, so ongoing inflammation, microglia activation, etc. And at the same time it typically immune insufficiency when it comes to the adaptive system; and so often poor cellular immunity. So no surprise, you have things like herpes viruses, you have things like mold and fungi and things like that that you're now more sensitive to. You're not particularly good at fighting those. Your antibodies can be decreased or can be normal or can even be increased. As you know with auto-immunity, you can see this for a number of reasons from molecular mimicry, so you may have things like viruses, but you, of course, also can see it from non-enzymatic alterations in your proteins. So, for example, if you eat a lot of sugar, you have advanced glycation end products, they interact.

Dr. Dale: So you have things like, you know, [inaudible] on the shark. You've got your hemoglobin A1C, but you have hundreds of other proteins that have this glycation that should not be there. And if your immune system recognizes that as foreign, you then develop antibodies. These cross-react with the normal protein. So by definition you now have auto antibodies also. For example, if you have low zinc, which many of these people do, about a billion people globally. As you know, you not only have a decrease in your peak response to antigens, but you have a broadening of it so you're not as good at focusing on one antigen. And what do you end up with? Auto antibodies. So there are numerous ways that you can end up with autoimmunity in Alzheimer's. And we do see it. We see people who have interactions, antibodies to specific proteins within their brains, such as enzymatic proteins to produce neurotransmitters such as a amyloid itself, such as tau.

Dr. Dale: Dr. Ari Bush Dani has actually produced a new panel that looks at antibodies that people with Alzheimer's have. This is his array, 18 or so-called links that looks at specific

antigens that are present in Alzheimer's. So we do see some who have auto antibodies and we see others who do not. We frequently do see people who are immunodeficient not as much as an HIV, but have some immunodeficiency. And if you measure their response, for example, their CD4 function, there's cytotoxic T cell, they're essentially helper T cells. What do you see? You see a reduction in their response to antigens. So the immune system seems to play a very important role in Alzheimer's and other neurodegenerative diseases in a number of different ways.

Dr. Keesha: Vibrant Wellness I think has a NeuroZoomer plus, right? That will look at whether or not you're creating antibodies against your own dopamine receptors, and more, but it's crazy. And what we can actually start attacking in ourselves. And I always talked about with my patients, a hypervigilant mind leads to a hypervigilant immune system. It's really nice if we can actually get these answers and calm that down; that anxiety and that worry.

Dr. Dale: No, you don't want it to be over-reactive and you don't want it to be under-reacting. So it really is an optimal sort of situation that you need. It really is the Goldilocks immune system.

Dr. Keesha: That's what I call it too.

Dr. Dale: That's really the way you want it to be.

Dr. Keesha: Let's circle back to that statement that you talked about in the front of our conversation about this new increase in a toxic form of Alzheimer's in particularly women in their 50s. One of the things that we know about autoimmune disease is 80% of them are diagnosed in women and there's not a firm "why" in that. But my suspicion has been our estrogen receptors, all the estrogen disrupting chemicals and mimickers that are out in our environment ubiquitously now. We also have different brain structure the way that we're built. So it's an interesting, breast cancer being higher in certain parts of the United States. And some of the demographics that we've looked at in science is, oh, some of the women that are being diagnosed with breast cancer in these areas like Long Beach or Marin County in California are higher users of dry cleaning and leather seats, and higher end cars that have a lot of chemicals on them and fake fingernails. And a lot of eating, drinking out of plastic bottles; the water out of plastic bottles, this kind of stuff. Is that a discussion in this toxic form of Alzheimer's that's being diagnosed at a higher incidence in women?

Dr. Dale: Absolutely. We were taught in medical school that there are toxins are not a terribly common cause of disease and these are typically a massive amount of mercury or a massive amount of cadmium or something like that. And just as we're learning that so many of these diseases had contributors from multiple different sources, we're finding that these sources of toxicity, which is not the kind of classical you're dying of mercury toxicity. These over the years give you things like autoimmunity, leaky gut arthritis, brain disease, things like this. ALS, you know, a big, big concern. What happened with us was we started looking at metabolic profiling of Alzheimer's. And we published this back in

2015 and what we noticed was the classical approach that we had discovered in the lab is that Alzheimer's is really about a switch.

Dr. Dale: It's really about your body sensing whether you have pathogens, whether you have enough support, everything from vitamin D, estradiol, all of these things are critical. Testosterone, omega-3 fats, immunity as you talked about, all of these things are critical in that switch to determine whether you're literally going to downsize and protect your neural network or whether in fact you're allowed to make new connections. It's no different than what you do as a CEO of a company. Are you ready to grow or you have to pull back and your brain is making that same sort of response. So we started treating people based on that. We saw the first reversals, which we published back in 2014 people getting better for the first time. And what we found is there was a subgroup of people that did not respond and we didn't understand what was going on.

Dr. Dale: So we started looking into them and talking to all the spouses trying to understand what was going on. And we found out ultimately that these were people who had tremendous exposure to different toxins. In fact, we found that many of them had exposure to mycotoxins from molds and many of them in fact had the classic, Dr. Shoemaker described increases in things like C4A and TGF beta one and essentially the biochemical marker of what he has called chronic inflammatory response syndrome or CIRS. And yet they didn't have the peripheral manifestations. So it was a little bit of Sherlock Holmes story here. We started going through these and started saying, Hmm, these people act like they have CIRS. But the main damage seems to be in the brain. So then when we started addressing those specific toxins, they started to get better. So we started realizing, okay, if these toxins are playing a role in their disease, and they come in three groups, some of them have metallo-toxins, so they may have mercury, inorganic or organic.

Dr. Dale: Some of them have organic toxins. So in fact, we had someone, for example, who had a tremendous exposure to a paraffin candle burning very high levels in her blood and she was in her late forties, very high levels in her blood of toluene and benzene and things like that. And developed this, what we now call type three Alzheimer's, which is often a cortical presentation. It's a different presentation of Alzheimer's. They don't typically start out with the amnestic presentation. In her case, she had what's called primary progressive aphasia. So she had trouble speaking, which essentially turns into Alzheimer's over time. Then the third group--

Dr. Keesha: Which can be the presentation of ALS in women that I've seen. Yeah.

Dr. Dale: So ALS is linked, as you know, to frontotemporal dementia. So the classical ALS is weakness, difficulty speaking, etc. But more because of motor speaking.

Dr. Dale: Whereas this is word finding. So the third group then is the bio toxins. So these are people who typically have exposure to specific mold species like Stachybotrys and penicillium, Aspergillus, Chaetomium, Wallemia, these are good things to know. It's good to know. As you know, it's good to know if your house has mold in it. It's good to

know if it has the molds because there are lots of molds that don't make these neurotoxins. It's an immuno toxins, but there's a subset that does and so great to get an ERMI score from your house, which you can do easily if you know through mycometrics for example, and check to see, this was a test setup actually by the environmental protection agency. It's EPA relative mold index for ERMI and good to know if you've got those particular molds because in fact they can give you all sorts of problems as you know, from lung diseases to thyroid diseases to skin diseases. And now we know dementia as well.

Dr. Keesha: So there's another one too. We had a mold toxin talk on this Summit; Dr. Ann Shippy, but also another one on breast implant illness were finding that some of the saline implants, not the silicone; silicone, you know, stays contained, but the saline has a valve that when someone goes and has a mammogram or you know, the valve can actually become dislodged and fluid goes in and out and can create mold so that your mold toxicity source is within.

Dr. Dale: Yeah, that's a really good point. In fact, we've had a number of people where that seemed to be part of the overall picture and in fact there is a kind of buried report out of the UK from a few years ago where they looked at whether breast implants were epidemiologically associated with dementia. And their finding was that they were. So we were right. You need to check. And so what I recommend for people who have them or want to have them simply, you know, check over time, check your C4A, check your TGF beta one. If you're having that kind of immune response to them, that kind of ongoing inflammation, then you should consider having them out. Again if you're going to have them out be careful because if you're going to go under general anesthesia, that's also a risk factor for Alzheimer's disease. So just be careful in the fact we one person actually had them out under local and did fine. Something to think about going forward

Dr. Keesha: I would have never suspected that was even an option. So that's interesting. So local anesthesia for removal.

Dr. Dale: It's something to consider, again, talk to your surgeon about that and your anesthesiologist.

Dr. Keesha: This is a big one. The explantation process has to be done properly or it can actually cause more problems.

Dr. Dale: If you are going to do general anesthesia, okay, then you want to make sure there's certainly a lot of people have to go under general anesthesia for various reasons. If you're going to do that, fine, then get ready for it. Make sure your glutathione is optimal. Make sure that your detox pathways are good. You know, your gut is healed, you're having a high fiber diet, your vitamin C is good, all the things that support your detox, make sure your methylation is, et cetera, et cetera. And then once you have it, then you want to again, pour it on and make sure that you get rid of those toxic anesthetic agents. They will hang on for a while otherwise, and they absolutely are. So we hear the story all the time; my husband or my wife or my mother, whatever, started

having dementia, and gee, it was after an operation that lasted a few hours and a couple anesthesia in the last year. And this is a common predecessor to cognitive decline.

Dr. Keesha: So this comes under the heading, of course, the brain reserve, right? I's what I've always called critical mass. We never know what your reserve is when you go to that last camel's back. The straw that broke the camel's back, right? They'll finally tip the entire thing over.

Dr. Dale: But my argument is don't count on your reserve. Doesn't matter if you, let's say you're the smartest person in the world, you've got tons of reserves, you still don't want to lose it, right? That's when you compromise things and I should add a professor, Mike Merzenich out of UCSF points out that global cognitive abilities were better. We had more focus of better attending, you know, there would be fewer plane crashes, there would be fewer car crashes, things like that. So the argument is, look, this is not just about preventing and reversing cognitive decline. This looking at your systemic inflammation, infections, immunity, toxins, all these things are also about making normal cognition better. We can all use that extra push in our everyday lives, you know, solving problems more easily. There's nothing wrong with that.

Dr. Keesha: You mean an extra cup of coffee by the pilot? Doesn't really do it to keep the brain functional in the air?

Dr. Dale: People who drink coffee do have a lower risk for Alzheimer's disease. So coffee's got some good things. Of course it has issues with your adrenals and things, but it doesn't lose your cyclic AMP and that does reduce. But you're right, there are hundreds of things you can do beyond coffee. That's a good point.

Dr. Keesha: Yeah. And I do want to mention to all of the middle aged women that are listening to this and are cheering because coffee just got put on the pro list. But you know, if you're having cardiac palpitations and you're in menopause and having hot flashes coffee is making it worse.

Dr. Dale: It's a really good point. And you know, we always tend to think good, bad, right? Humans are not quite that simple. Good, bad, you know, is running good or bad? Well if you have to run 150 miles and you die along the way, it's probably not so good. But you know, running around the right number of times. Good thing. So you know, same thing with coffee. Coffee has some good things, coffee has some bad things.

Dr. Keesha: Let's talk about in your book, which I just want to again express deep appreciation for, my husband carries the APOE4 SNP and his mother is in active Alzheimer's right now. And you know, it's been really helpful for me to be able to say, here, just read this, you know, instead of, and we all know that as spouses it's sort of hard for a spouse to hear and take advice from you. It's really nice.

Dr. Dale: The reality this is, you know, it sounds crazy, but it's actually true. Alzheimer's disease should virtually end with the current generation. We and the people who are less than

50 currently or less than 60 currently should not have to worry about it. Our sons and daughters should live in a world in which Alzheimer's is a rare and readily treatable illness. And here's why. Now that we understand much better, and I talked about this in the book, now that we understand the biochemistry that drives this disease much better than we did even 10 years ago, we can look at this and people can literally get a cognoscopy. Just as everybody knows they should get a colonoscopy when they turn 50 we should get a cognoscopy when we turn 45 or older. And you mentioned your husband with APOE4.

Dr. Dale: So let's talk about APOE4 for a second. There are 75 million Americans who have one copy. There are 7 million Americans who have two copies. If you have zero copies, your chance of Alzheimer's during your lifetime, about 9%. If you have a single copy, about 30%l if you have two copies, well over 50% most likely you will get it. Nobody should get it. If you go on the right prevention program, and get the appropriate thing. So as we know what's driving it, let's prevent those things that are driving it. Your husband should never have to worry about this. And as you know, there's a wonderful website started by Julie G who's a APOE4 that is called APOE4.info. There are over 3,500 people all APOE4 positive who share information and most are on some version of the protocol that I described in the book. And so the key, again, it is yes, APOE4 increases your risk, just like cholesterol increases your risk for heart disease. But again, you do the right things. You don't get heart disease, you do the right things, you don't get dementia.

Dr. Keesha: My husband's been a vegetarian since he was in his early twenties and his dad was an alcoholic, so he hasn't had any really virtually no alcohol and all these decades too. And his brain's fantastic. He's 67 years old and he's a meditation teacher, so it's this amazing path that he's taken that matches genetics very well, that his mom did not take. She has wine every night with her meals and is a big meat eater and her cognitive function is terrible. People will think of it as a deprivation process. Oh, I can't have, instead of as what I always try and get, you know, the people that are listening to this right now and who I work with as more of a collaborative relationship between your brain, your heart, yourselves, your genetics, your mental processes.

Dr. Keesha: Just collaborating and saying, okay, so if I do this, what's the outcome? It's like you are the scientific experiment, you know? And I think instead what people will do is say, well you know, the rest of society is living this way. How come I can't and start to feel very deprived. And when I look at my husband, he's such a great example of what it looks like to really collaborate and listen to his system and say, Oh yeah, I feel so much better when I do it this way. So it's really boiling it down to you are your science fair experiment from fifth grade.

Dr. Dale: May your experiment be joyful. A question is, does he know his nocturnal oximetry? That's turning out to be one of the most important contributors. So there are, as you know, dozens of contributors to cognitive decline and make sure it doesn't sneak up on you. You want to know these different parameters. And so obviously I'm sure you've checked his homocysteine, I'm sure his HSC RP, I'm sure you've checked his gut microbiome, but it's also important to check his nocturnal oximetry. We're seeing a

number of people who drop low at night with or without sleep apnea. That actually is an important contributor and a very fixable one. Of course I'm sure he checks things like periodontitis, gingivitis, dental amalgams, all those sorts of things. As we talked about, gut health is another big one.

Dr. Dale: Methylation is another big one, glutathione another big one, detox another big one. So yeah, the reality is you can look at your own biochemistry. This is no longer a black box. This is no longer magic. Someone just comes down with dementia for we don't know why. No, we do know why. And in fact, we can see it coming for over a year, decade before you have a diagnosis of Alzheimer's. So that's why we recommend to everybody if you don't get on prevention, that again, on the earliest possible reversal people that come in early, we see virtually all of them get better when they do the right things, whereas people who are very late, and we have that, some people with mica scores of zero, these are Montreal Cognitive Assessments of zero, late stage Alzheimer's who improved, but it's much harder and they don't improve as much. Whereas the ones who started early, right?

Dr. Keesha: Yeah. You know, you just sent an alarm bell through my system because he's in Tibet right now and I talked to him yesterday. He did a circumambulation of a mountain there called Mount Kailash and got up to 18,500 feet and they had a pulse oximeter up there. And on the way down, I think they'd been down for a good day. He was still hanging at 89%. So I said we have to get you saturated.

Dr. Dale: Knowing where it should be, I know that there are people who are climbers that where people who work with them would talk about it. They'd come back from a big climb and you know, for a month they're not quite the same person. And then ultimately they kind of get back to their normal. Okay, well great. But you know, that's not good for your brain. And especially if you're dealing with APOE4, you are sensitive to that sort of thing. So yeah, you want to make sure, and especially if you're over 45 you want to make sure, keep that oxygen saturation good both during the daytime and while you're sleeping. And I don't know if he likes EWOT; have you ever done the exercise with oxygen training? We'll actually put a hundred percent oxygen mask just for 15 or 20 minutes a day and you know, pedal a bike. And that's really striking those have. So yeah, I think you're absolutely right to be thinking about his oxygenation.

Dr. Keesha: In your program, just to do a recap, you just rattled off a whole bunch of things for people to watch for, but in End Alzheimer's Now there's a really nice food plan there. All of this is listed out; laboratory, what a cognoscope actually looks like and it doesn't actually have light on the end of the big tube that shoved anywhere in your body. It's much more pleasant. I just want to make sure people know there's a resource. If the information came flying out too quickly. These tests that we've been talking about here, these are part of the unzip your genes program that I run. I look at these SNPs and then what I call boots on the ground. Just because you have a genetic SNP doesn't mean it's actually actively causing you trouble. So we can do these other tests to find out what is real and what's happening. Because we never treat genetic SNPs as a problem. We look to see what's happening as a result of having it, you know, is it expressing itself? None

of this is cause for alarm. It's just the thing way that I think about it is that directs us to what rocks to turn over to look under as you're aging so that she can do it with grace and ease instead of, you know, big surprises that are not fun.

Dr. Dale: Well, yeah, no question.

Dr. Keesha: Genetics, as you mentioned, and your biochemistry work hand in hand, and you're right. So, depending on your genetics you may be better or worse at detoxing certain things better or worse. Methylation, your homocysteine may be higher or lower. So they really work together and I think it's very helpful to know both because it's that biochemistry that is ultimately driving this beautiful balance that we have between the synaptoblastic activity, the making and storing of memories and the synapticoclastic activity. Just like with osteoporosis, with osteoblastic and osteoclastic, the synaptoclastic is pulling these apart and we're actively forgetting the seventh song that played on the radio on the way to work yesterday and we're just remembering the most important things where our keys are, how to speak, and how to do our jobs and how to read all these things. And so as long as you're able to make and store synapses, you're in good shape. What Alzheimer's really is

Dr. Dale: Essentially is a synaptoporosis; you are pulling back. Good news, we can measure all the things that are causing that and we can tweak them so that you're now on the positive side of that balance instead of the wrong side of that.

Dr. Keesha: Synaptoporosis. This is a nice way of thinking about it. And the other thing that I want to point out, you know you mentioned a bunch of words that a lot of are very, very intelligent and well educated followers are cognizant of like methylation, like homocysteine, COMT. A lot of people are really familiar with these terms now and there are companies that have artificial intelligence, AI programs that we'll pick out those SNPs and talk about them in isolation of each other. That is not what you want. We actually really want to look at the entire thing as a system because that's what you are and how they interact with one another.

Dr. Keesha: And that's another thing that I just really want to talk about that isn't just about APOE4 or cytochrome P451 B1 or a COMT or MTHFR. It's really about the entire picture and that's why adding these other, the biochemistry in your actual context of your story, your diet, how much sleep you're getting, what's your oximetry is at night. You know, all of these things are part and parcel of the puzzle that we're putting together when we're looking at reversing something that's going on for you that isn't comfortable.

Dr. Dale: For years there has been this reductionist approach where that's okay, Alzheimer's must be due to blank. Oh, it's infection one day. It's because of reactive oxygen species another day. It's because of amyloid. It's because of tau. It just goes on and on and on. And it's like saying, what is that one instrument that makes the orchestra? And you look at instrument after instrument after instrument. Gee, that doesn't sound like an orchestra. Of course not. Human beings are not that simple, but it's just that one thing. And of course a lot of people heard recently about the resurrection or attempted

resurrection of an antibody to amyloid that failed clearly in trials. And now everyone's excited because we're going to see if this is going to be approved by the FDA.

Dr. Dale: And the reality is, at the best it doesn't make you better but it may slow the decline a little bit so what happened was two studies were done. One showed not any slowing of the decline it was no better than water. Another study suggested there might be slight slowing of decline. So that's the argument. And I think that these sorts of antibodies in the long run will be helpful after you've gotten rid of whatever is causing you to make the amyloid; which is really part of your innate immune system. It is a response to these various insults so the idea of getting rid of your protection doesn't make a lot of sense and no surprise that people who had the antibody did worse on the antibody. But, there's this question about everyone wants to do one thing and okay let's get this one thing and unfortunately as you know when it's a drug like this billions and billions of dollars are on the line so even if you can show a tiny, tiny slowing of the decline it's going to sell for many billions of dollars. So my hope is that we'll focus more on actually improving and do things to treat the body as it really works which is as an orchestra.

Dr. Keesha: I feel the same way when people read oh, coffee is good for me, blueberries is a superfood and coconut in my oatmeal I'm going to protect myself from Alzheimer's and live on 5 hours of sleep a night.

Dr. Keesha: It's going to be a whole puzzle. Dr. Bredesen, thank you so much for coming on and sharing your wisdom with us, and this is really an amazing discussion.

Dr. Dale: Thanks very much, Dr. Keesha. Thanks for having me on.

Dr. Keesha: Again, you guys, its End Alzheimer's Now. Until next time.