Transcript: Why Vitamin E Is Key for Liver Health and Detox with Dr. Barrie Tan

Wendy Myers: Hello, I'm Wendy Myers of myersdetox.com. Thank you so much for joining me today for the *Myers Detox Podcast*. You can learn more about my work and how to detox at myersdetox.com. That's what this show is all about. How to detox our bodies. We talk about all types of subjects relating to detox protocols and supplements. We discuss what to do and what not to do, so that you can remove heavy metals and chemicals from your body which contribute to every imaginable symptom and health condition. Today is a fantastic show with Dr. Barrie Tan. We're going to be talking about why vitamin E is key for liver health and detoxification. We're going to be talking about how the tocotrienol form of vitamin E is 50 times more powerful than the form of vitamin E tocopherol, which is in 95% of supplements and multivitamins today.

Wendy Myers: We'll talk about why tocotrienols are one of the most important antioxidants and why most people are deficient. We'll discuss why you can't get enough of the preferred form of vitamin E from food alone and how the preferred form of vitamin E is shown to aid weight loss. He showed what I think was a 15 pound weight loss, in one of the studies that Dr. Tan did. It also showed how it reverses chronic conditions and inflammation. We'll talk about how tocotrienol improves liver health and the liver's ability to detox. It reverses markers of nonalcoholic fatty liver disease which is pretty impressive. These are namely high cholesterol, liver enzymes and triglycerides. We'll also discuss how tocotrienols aid in liver and heavy metals detox, namely arsenic and lead. We'll talk about the studies that Dr. Tan has done on four different types of stage four cancers, including ovarian and breast cancer, and the dramatic results when taking the tocotrienols. It improved outcomes and longevity of these cancer patients.

Wendy Myers: We'll talk about how tocotrienols work to protect fats in cells. They prevent the fats in oil supplements, cooking oils and in our diet from going rancid, oxidizing and damaging our cells and body thus creating these free radicals. Vitamin E is a powerful antioxidant that stops this destruction and these oils from going

rancid. We'll also talk about how tocotrienols are shown to improve bone health, reduce inflammation and lower cholesterol levels, as well. It's a fantastic show today. I know you guys listening are concerned about heavy metals and how to detox, so I created a heavy metals quiz that you can take at heavymetalsquiz.com. After you take this quiz, you will get your results and a free video series. These answer many of your frequently asked questions about detox. Where to get started? What are the best supplements for detox? What is the best heavy metals testing to do? How do I do it all? Go take that quiz at heavymetalsquiz.com, there's a free video series afterwards.

Wendy Myers: Our guest today, Dr. Barrie Tan, is hailed as a trailblazer and the world's foremost expert on vitamin E. He is credited with discovering tocotrienol in three major natural sources, palm, rice and annatto which is a fruit from the Amazon. A scientist, first and foremost, Dr. Tan earned his PhD in chemistry and biochemistry from the University of Otago, New Zealand. He spent several years as a professor at University of Massachusetts. Today his research focuses on lipids, soluble nutrients that reduce and slow chronic conditions. Listeners can download a free copy of Dr. Tan's book, The Truth About Vitamin E: The Secret to Thriving with Annatto Tocotrienols by visiting his website, barrietan.com, and entering the code, myers detox. His website is B-A-R-R-I-E-T-A-N.com. Dr. Tan, thank you so much for joining us.

Dr. Barrie Tan: Thank you. I'm glad to be here. I'm looking forward to your show.

Wendy Myers: Tell me a little bit about vitamin E. This is something that I've studied while studying nutrition. Vitamin E is in all of the supplements, but what is it that consumers are being misled about when it comes to vitamin E? It's not as simple as people think it is.

Dr. Barrie Tan: I'll keep the first part simple: vitamin E was discovered almost a hundred years ago by two pediatricians from University of California in 1922. We hope to make a special 100 year anniversary of the discovery in 2022, so we have two years in the planning. When they first discovered vitamin E, it was alpha tocopherol. They just went through the alphabet and E was it. It was vitamin E, it was oil soluble and strangely enough they got it from spinach extract. They gave it to female rats. They didn't know what it was initially, but found that without this factor the rat was not able to bring the fetus to full term. It became a vitamin because it was able to help the maternal female bring the fetus to full term.

Dr. Barrie Tan: Most people today don't think of vitamin E that way. Instead they think of vitamin E as an antioxidant. To that extent, tocopherol as a group and tocotrienol as a group, are both vitamin E. They are the same antioxidant, but because vitamin E as tocopherol has been known for more than 40 years and tocotrienol has been known as a vitamin E 40 years later, most of the consumers know vitamin E as tocopherol. The same tocopherol that's on your cereal box. That's a very simple view of vitamin E.

Wendy Myers: There's a lot more to the story, like there are different forms of vitamin E and some are better for us than others. You discovered a form of vitamin E, can you tell us about that?

Dr. Barrie Tan: In the original form of vitamin E, I have a molecule to show that Kim set up for me. If you notice that this hat is the antioxidant hat or oxygen radical, and it captures free radicals. All vitamin E, tocopherol and tocotrienol, have this kind. The tail is the thing that distinguishes the two other forms of vitamin E. Tocopherol has a double bond here, see? Two rings, two here and two here, because of the three double bonds in scientific language it's called “in” for double bond and “tri-in” three double bonds. Tocotrienol has the three double bonds, so tocotrienol is unsaturated vitamin E and tocopherol is saturated vitamin E. That separates the two groups. Each of these groups have four molecules. The tocopherol has the four Greek letters, alpha, beta, delta, gamma tocopherol, and the tocotrienol also has four Greek letters, alpha, beta, delta, gamma tocotrienol.

Dr. Barrie Tan: I know we're going to go deeply into this, but just keep the two Greek letters in mind. The two vitamin Es that are most potent, hands down, would be delta tocotrienol as in Delta Airlines, and gamma tocotrienol. If somebody wished to Google them on the internet, they are delta and gamma tocotrienol, there you have it. You'll have the two most potent forms. I'm going to tell you the next thing. About 20 over years ago, I went to South America and I stumbled on this beautiful plant there. Actually, the whole plant is about the size of a fig, this is oversized. If I put it closer, you can see the seed. The seed is intensely red in color. The seeds that have that color are called annatto. Annatto is the color we use to color our cheese and meat.

Dr. Barrie Tan: When I was in Tampa, Florida, I saw an Amazonian plant. See this plant here is the same annatto? You can see the seed on the side. There you can see an Amazonian tree frog about the size of a dime. It's very tiny. If I were to put my finger on it, it's not much bigger than my palm. So, if you shrink my whole palm to the size of a penny, that is the size of the frog. This is a very enlarged picture. It's truly an Amazonian plant. I was in South America about 22 or 23 years ago. I was there looking for lutein, which is good for macular degeneration of the eye. It’s in giant marigold plants. I found it. That was the reason why I went there.

Dr. Barrie Tan: Then as fate has it, about 20 or 30 feet away from me, I saw this annatto plant. I knew what an annatto plant was. The British actually nickname it “the lipstick plant”. I'm trying to find out if a woman's lipstick, which originally was a traditional red color, came from that. I don't know yet, but the British named it about 300 years ago. They refer to this as a lipstick plant. If you go to a tropical botanical garden, you can either say “annatto plant”, or use its scientific name, Bixa orellana, or you can use the nickname, the lipstick plant, and a botanist will show you where the plant is. I knew that the color which is bixin, a carotene, is very unstable. When the pod opens, it doesn't have flesh like most fruits. It's a very unusual fruit. Almost everything you and I know about fruit is that they

have flesh, which we eat and then leave the seeds behind, but this does not have flesh.

Dr. Barrie Tan: I knew something had to protect the bixin from decomposing. I wasn't expecting it to be a vitamin E molecule. I was expecting it to be a polyphenol because plants have 2000 to 3000 polyphenols and only eight vitamin E. So, I wasn't expecting it. It surprised me that it was a vitamin E, that was a huge surprise. Further surprising me was that it does not contain tocopherol. Most surprising to me was that it only contains tocotrienol and this is shocking. It only contained the two tocotrienols that are most potent, as I mentioned earlier, the delta and the gamma tocotrienol. That was a discovery.

Wendy Myers: Why do we need this? Why is this important? Why did you focus your research on this? Are people deficient in this? I know it's great for detox. Vitamin E detoxes arsenic and lead. It's shown in the research to help with that. Why else do we need it?

Dr. Barrie Tan: Actually, that's an excellent question. When I first got into this, I knew it was an antioxidant. When we compare tocopherol and tocotrienol, tocotrienol is 50 times more potent. Besides that, I didn't know where to go with it. That was in the early '80s and '90s. People started to do research work on lowering cholesterol. That was at the University of Wisconsin in Madison. Then later a Canadian group started to do work on cancer research. When people started to do this kind of work, I began to build the concept that tocotrienol works to mitigate chronic conditions. I said, "Okay, if it mitigates chronic conditions, it's better than just being a powerful antioxidant, it's good enough for the consumer to get a hold of". I want the consumer to know more than that though, it's a better antioxidant to do what with?

Dr. Barrie Tan: Fast forward from the 1980s to today. We have done numerous animal and clinical studies. Among the clinical studies, we have done cancer studies, which is clearly chronic. I know there is juvenile cancer, but most cancers are adult onset, so it's chronic. The other one would be people with dyslipidemia, high cholesterol, high triglycerides. It's not a good thing. I'm hoping that in the second half of this show, we'll talk a lot about fatty liver disease. It's definitely a chronic condition. So we've done this and we now have a study in Texas. Oh, it's in your state. It's at Texas Tech University in Lubbock, Texas. We first did a study five years ago on postmenopausal women with osteopenia, when estrogen drops and the bone begin to thin, and how it resists the bone loss. Clearly a chronic condition as a woman ages.

Dr. Barrie Tan: We are also currently doing a study on obesity. The professor said that obesity stresses the person even more so than osteopenia. We now have an obesity study on postmenopausal women. The study is ongoing. We don't know the results. It's double blind. In other words, we put it to the gold standard of tests. The professor does not know and neither does the subject, until the whole study is completed. It'll probably take another year before it finishes. However, the NAFLD, fatty liver disease, that's completed. We're doing a further study, which

I'll explain more, and a cancer study is ongoing. To answer your question, we know that tocotrienol, unlike tocopherol, can help people with chronic conditions including toxicity. You talk about lead poisoning.

Dr. Barrie Tan: I did not study that directly. If I were to study that directly, usually when people have lead poisoning, or arsenic poisoning, or terrible pesticide poisoning, I know some of them land in the hair, but a lot of these land in the liver and it destroys the liver. When they get to a certain degree of damage, the tocotrienol can help the liver. At least if it's not coming back to full par, it's able to help not damage the liver any further. I believe that would be detoxing, but we did not commit to go down that road of study because it's not directly chronic. If someone is exposed to serious toxifying things, there are animal studies other people have published, where an animal is exposed to toxic metal waste and they found the tocotrienol was able to curb the damage to the liver.

Wendy Myers: That's amazing that you did a study on nonalcoholic fatty liver disease, because that's affecting almost a hundred million people in the United States alone. Anyone with metabolic syndrome, diabetes, high cholesterol or high blood pressure is going to have a fatty liver presenting along with those diagnoses. That's just the people that have a diagnosable condition, not to mention just poor functioning livers that are overwhelmed with poor diets and the toxicity in the environment. I love that you did that study. Are you able to explain exactly how vitamin E is facilitating the liver's ability to do its job better? What is the mechanism there?

Dr. Barrie Tan: Usually, I present two mechanisms. The first one is more physiological. If you think of a cell, let's say my cell phone here is a cell. A cell is more like an oval shape, like a bean shape. Let's say this is a cell. The black surface will be the inside of the cell, the nucleus, the mitochondria and all these wonderful things. The outside, the blue lining, that will be the cell wall. There are many antioxidants people talk about, but the antioxidants that I care about the most are the antioxidants that protect lipids. Immediately, you cut the noise out because everybody and their grandmother is talking about antioxidants. You don't know what they're talking about. You know why I care about the lipid antioxidant? Between proteins, fats and carbohydrates, they all can get oxidized. The one that is easiest to get oxidized by oxygen are the lipids.

Dr. Barrie Tan: So in other words, if you see a roadkill, the first thing that goes off flavor, you have a stick of butter on a summer day. At the first off smell of the butter or the meat, they go bad. It is the lipid that gets oxidized in the meat, in the butter and in the roadkill. Therefore, the first line of defense will be anything that protects the lipid. Back to the cell wall thing, the blue thing is a cell wall and the entire cell wall membrane is built with fat. An athlete will have approximately 20% fat by weight, a normal person will be 25 to 30% just for simplicity. Half of that 25% weight is the adipose tissue, the love handles and this and that. The other half of them are all in the cell wall. You cannot see it. It's all over your body in the 38 trillion cells. Those cells have the highest chance to get oxidized. The antioxidants that reside on there are the kind of antioxidant I care about.

Dr. Barrie Tan: 90% of antioxidants are vitamin E. There are a gazillion antioxidants in the universe, the remaining 10%, not the 90%, are beta-carotene, lycopene, CoQ10 and those things. They're 90% vitamin E because the vitamin E molecule looks like this. The head sticks out with the phosphate group, the entire tail here, sticks in with the fatty acids. This whole thing is the one that protects the fatty acid. Now, I'm reducing it to help the audience understand that 90% of the things that protect your fat are vitamin E molecules. You've got two things left, tocopherol and tocotrienol. The tocotrienol is 50 times more potent than tocopherol. For that reason, antioxidants protect the lipid and that is the mechanism to protect the entire 38 trillion cells in our body.

Wendy Myers: I think this is a really important conversation as well, talking about reducing the ability of fats to go rancid. When people are eating these horrible industrial seed oils, it throws the body off of balance. Not only that, but ingesting oils that are already rancid and these highly inflammatory oils that we know are contributing to the chronic health conditions of our time. Even Whole Foods, if you go in there, all this beautiful, healthy food is just soaked in canola oil. If you go to eat Chinese food or Thai food or any kind of food, it's soaked in soybean oil, or all the fried foods. So many people who are even eating healthy vegetables and whatnot are ingesting tons and tons of rancid, polyunsaturated fats that are industrial seed oils. How does vitamin E help with that?

Dr. Barrie Tan: We provided annatto tocotrienol to a USDA doctor. Her name, you can Google it, Jill Moser, M-O-S-E-R, Peoria lab in Illinois. She probably had read some studies out there and she wanted to do a study. It's very unusual that we have a USDA scientist ask us for that. We said, "We'll be glad to provide it to you, may I ask what you're going to use it to study?" It would be unlikely they would do some animal study because they're USDA, not the FDA or NIH. She said, "I'm going to subject this to the highest degree of oxidation damage". I was holding my breath, so I said, "What are you going to do?" She said, "I'm going to use deep fried tortilla chips."

Dr. Barrie Tan: When you deep fry tortillas, the off-flavor happens very fast, faster than potatoes because it has a sulfur group in the corn meal. So she used normal deep frying. She had one with alpha tocopherol and then she had one with the annatto tocotrienol. She found that the fatty acid was oxidized less, contained the off-flavor and the burnt flavor, things like that. Now that's a very extreme example of people using deep frying because deep frying is 180 degrees Celsius, about 325 degrees Fahrenheit. We would be dead at 40 degrees Celsius, something like that. The other extreme was a University of Georgia professor. He was making infant formula with omega 3 for mothers who cannot express milk. When you make infant powder, it's got a huge surface area so the omega 3 can get oxidized.

Dr. Barrie Tan: They have a quandary, how to deliver the omega 3's and not deliver bad ones. They also tried it with alpha tocopherol, mixed tocopherol and with tocotrienol. They found that when they added tocotrienol, they were able to protect the

shelf life of the infant formula better than the others. Those are very practical applications. In the house, don't do that kind of research. We gave people the vitamin E tocotrienol when they had certain conditions, fatty liver, high cholesterol, high triglyceride, people with cancer, etc. To answer your question clearly and definitively, the tocotrienol is able to protect the fat. Particularly in an age where we are consuming a lot of poly and saturated fat. Some of them may be already highly oxidized, particularly the fried example. Then they use oil and fry again and again and again. There's no way to know how bad the oil is, that's been already used, before you eat your fries.

Wendy Myers: So many people's diets are so inflammatory. Even if they feel like they're eating a relatively healthy diet, they're still ingesting inflammatory oils. It's making its way in some way, whether it's eating poor quality animal proteins that have eaten soybeans and corn and whatnot. Then there's supplements. A lot of supplements are made with soybean oil on them or they have sunflower oil. These oils go rancid, even fish oils go rancid. A lot of people are ingesting these trying to reduce inflammation and it's having the opposite effect. I think vitamin E supplementation is super important. Do you feel like a lot of people are deficient in vitamin E? Are we able to get this from our diet?

Dr. Barrie Tan: You hear mixed messages on that. I'll tell you what the USDA said. As we grow older, we are not able to get enough vitamin E mostly because we are in nursing homes and then they cannot chew on meat. Vitamin E is found in oily and fatty material. For better or for worse that's where vitamin E is found, in vegetable oil, in avocado and in meat because the animal eats the corn and then they get the vitamin E. As we grow older, we eat less meat, so they are not insufficient in that sense. For most of the adult population that are not elderly, we don't have enough because the vitamin E that we have is used to protect the rancid fat, so they're insufficient and the vitamin E that we can get are mostly tocopherol.

Dr. Barrie Tan: It is true to say that in an average American diet, we'll be lucky to get the tocotrienol. We'll only have two milligrams, which is woefully inadequate. For tocopherol, maybe 10 or 12 milligrams, but tocotrienol only two milligrams. Most of the studies we do are with anywhere from 100 to 300 milligrams. So yes, we do not have enough of the vitamin E.

Wendy Myers: You've done lots of different studies. You've done them on advanced ovarian cancer and nonalcoholic fatty liver disease. The tocotrienols you've found can really help a lot of chronic conditions. Can you tell us how it's been effective for just inflammation in general and even bone health?

Dr. Barrie Tan: When we were doing the bone health study, we knew that it would lower inflammation, but we needed it to have a marker. So in the bone health study, we knew that during menopause, the estrogen drops, the estradiol drops. Partly because I'm not an estrogen specialist and also because I'm not a woman, I didn't take care of this. I have a wife, so she told me that the estrogen would drop, then I started to look at the estradiol. Estradiol is a steroid and our body does produce antioxidants. I don't mean antioxidant enzymes like glutathione

peroxidase or catalase. Those things are antioxidants, but we do produce molecules that are antioxidant.

Dr. Barrie Tan: One is well known, and one is hardly known. The well known one is CoQ10. CoQ10 is an antioxidant and the body produces it. The other one came to me as a surprise. Testosterone, the male hormone, is not an antioxidant. Progesterone, the female hormone, is not an antioxidant. Estradiol is an antioxidant. Now, when a woman goes into menopause and her estradiol drops, that means that the thing that protected her all her life, every 30 days, is no more or has precipitously dropped. I asked a professor who did the work because I had a gut feeling that the antioxidative stress will go this way when the estrogen goes the same way. I asked her, "Can you please measure the antioxidant drop and also measure the C-reactive protein?" She did. It was then that we knew that as the estrogen drops, the antioxidant protection provided by the tocotrienol increases. When tocotrienol is not given, the oxidative stress continues to increase. That was how we first learned about it.

Dr. Barrie Tan: After we knew that, in all the other studies, the one on NAFLD and the one on arteriosclerosis, we asked people to please measure C-reactive protein. That construct of arteriosclerosis came from a different angle. There was a time when a pharmaceutical company made cholesterol lowering drugs, and it lowered the cholesterol like mad. Then there were voices out there saying, cholesterol is not the demon. The other thing is the demon. As a scientist, I find it hard to believe that cholesterol can only be a good guy. I think that high cholesterol cannot be good. I'm not saying other things do not contribute to inflammation and bad things. High cholesterol cannot be a good thing. The whole study came from the Framingham Heart Study, and Framingham is in Massachusetts. We chose a little town in Massachusetts, like the small town in Texas, towns like that.

Dr. Barrie Tan: We are studying it for the fourth generation. It's US government funding. If you ever come to Boston, just take a ride to Framingham, Massachusetts. They'll tell you they studied the great grandfather, great grandmother, and then the grandparent and the parent, and now they studied them. It was in those studies they found that red meat caused arteriosclerosis and high cholesterol. This is not “finagle the bagel” by the drug company. It came from the Framingham study. So I know high cholesterol can't be good. When that study came out, people said, "Oh, half the people that died of cardiac arrest have high cholesterol. The other 1/2 have high inflammation. I got it." When I told the professor, "Can you please measure some inflammation markers?" He did just that. When we did the arteriosclerosis cholesterol study, let's say the cholesterol is relative, the cholesterol dropped, triglycerides also dropped about 15 to 20%. Then we did it at 125 milligram, we did at 250 milligram, we did more at 500 milligrams. We did more, so it's dose dependent.

Dr. Barrie Tan: Then on the flip side, the c-reactive protein is lowest. When we gave the 250 milligram and then the 50o milligram highest dose. There it was, we found the correspondence, the lipids dropped and the c reactive protein, the CRP, also dropped. I beg your pardon. I said wrong. The c reactive protein dropped and

the lipids also dropped. So we are able to address two, both the inflammatory component as well as a lipid component. Tocotrienol addressed both in lowering the arteriosclerotic and the cholesterol equation. Those were the very first clinical trials we did. After we did those trials, then we graduated to the cancer trial. I'll be happy to talk about them. When we did that, we also started the obesity trial. The obesity trial, we only have one. The cancer trial, we have five or six. Only one of them is published. The other one is still in the works. Next year we'll have more of that.

Wendy Myers: Fantastic.

Dr. Barrie Tan: You want me to talk about the cancer one?

Wendy Myers: I wanted to delve a little bit more into the cholesterol and inflammation one, because that's a big concern for a lot of people, heart disease, high cholesterol and high triglycerides. There are lots of nutrition studies out there. I think so many nutrition studies are very poorly designed and they're also using very poor forms of nutrients. That's why a lot of the mainstream media you'll see reporting, vilifying the supplement or vitamins don't work and this and that. People have to keep in perspective that these are studies that are typically using the worst or the cheapest form of the nutrient, because they have limited funding. Then these nutrients don't work by themselves. They usually have cofactors that help them absorb or work better.

Wendy Myers: I think people have to keep that in mind. I'm glad that there's much better nutritional studies like the one that you're doing. What about dosing? If people want to get these benefits like lowering inflammation and lowering cholesterol, what's the dosage per day that people should take? You designed this supplement here, it's the Designs for Health Annatto-E 300. This is the one I've been taking. How much of this should we take per day?

Dr. Barrie Tan: I would say for normal antioxidant protection because all of us have 38 trillion cells that I mentioned, depending on the person's size and weight and disposition to disease, anywhere from about 200 to 300 milligram, let’s say 200. For people that have mild chronic conditions, then probably about 300 to 400 would be good. For people who have serious chronic conditions, about 400 to 600 milligrams. I’ll summarize for you. For people who have serious chronic conditions, 400 to 600 mg, mild chronic conditions, 300 to 400 mg, for the others 300 mg or less is fine. Designed for Health also sells a 150 milligram one, 150 to 300 milligrams. I crafted that from the studies we did. On the people with arteriosclerosis we found that the best number that works is somewhere between 250 to 500 mg. In the osteopenia study on women with thinning bones, we found that the one that worked best is 300 mg.

Dr. Barrie Tan: On the cancer study, now keep in mind, they were stage four cancer patients. That means that your odds are not good, so they took 900 milligrams, the highest dose. We are trying to design a study in Florida now for people that have polyps. They are like stage one and two, not end stage. They'll probably be

taking about 500 to 600 milligrams depending on the kind of cancer. In the fatty liver disease study, they are taking 600 milligrams. We have not tested the 300 milligrams. In the future we will. We wanted to stay thematically the same element. I hope I answered this question. You also asked about people who do substandard research or the quality of the material is not good. I cannot agree with you more. I usually don't talk about this.

Dr. Barrie Tan: First, we are the only company in the US making tocotrienol. We make them here in the United States of America. We don't make it anywhere else. I'm an immigrant to the US. I have many opportunities where people ask me to do it in other countries. I don't want to name the countries, then I black list them. I don't want to do that. I didn't do it. I made it here in the United States. Furthermore, we never use solvents. We never use chemicals. We just use physical means and then just evaporate them. If you ever come to New England, you'll come to see me. It is as good as it can be. When we make the vitamin in our original concentration, as high as we can, about 70%, you are not going to find another vitamin E like that.

Dr. Barrie Tan: If you look at the soft gel that we make, 300 milligrams is in that tiny pill. It is good. 25 years, that's a long time I tried to make this. I could easily use chemicals but I make it super clean. People ask, "How did you make it?" "I have to use this chemical, that solvent." "You did what?" I decided not to do that. My wife loves to go to Whole Foods. She watches me while I'm doing it. I decided that since I discovered this when I was in Amazonia, I said, "I owe it to the world and to Amazonia." There are millions of plants. I happened to stumble on the one that does so much good to us. It's the highest purity possible. With this NAFLD thing, we hope that we can do more studies and perhaps ask the FDA to have a structure function claim someday for the NAFLD one.

Wendy Myers: Well, you're well on your way. That's why I wanted to have you on, because I'm a supplement snob. I only want to take the best. I know a lot of people listening to this show, they only want the best for their health, and I'm taking this because I'm hitting menopause and I'm turning 48 next week. I'm looking to do an oil change right now, essentially. I'm trying to get rid of a lot of the polyunsaturated fats that I've eaten over the years and get those out of my fat and do an oil change. The vitamin E is really important to facilitate that especially if you're detoxing and you're losing a lot of weight. These rancid fats that are full of pesticides and chemicals and metals are coming out of your fat. You need to be taking a vitamin E to help that and help your liver process all this garbage. Vitamin E is a very important part of detoxification.

Dr. Barrie Tan: I would say, do not supplement with a tocopherol. Don't do that. I have stopped taking tocopherol for the past 30 years and nothing ever happened. When you eat normal, fresh fruit, you are going to get about 10 milligram of tocopherol, and it's good enough. Tocotrienol is hard to get. In a normal American diet you can get about two milligrams, probably eating corn or corn oil or something like that. That's a small amount. Avocado is a tad more, but you can only consume so much avocado. If you happen to live in South America, because they eat a lot

of annatto they probably approach 10 milligrams, still small. If you take Palm oil, you probably also get about 10 milligram, but the Palm oil is saturated. It has other concerns. I think that supplementation is the way to go. When you take the supplement, take it with a meal because it's oil soluble.

Dr. Barrie Tan: If you take it with a meal, it emulsifies properly and it absorbs properly. I have been taking tocotrienol now for about 25 or 30 years, probably one of the longest ones. I took it initially to manage my cholesterol which was moderately high, but I have a genetic glycemia, so it didn't drop dramatically. It dropped somewhat, but my buoyant ldl increased. My dense atherogenic LDL is decreasing, all this wonderful stuff. My triglyceride is low. My C-reactive protein is very low, so all good. If we have a few moments, I'd like to talk about the cancers. I tell you why it was risky for us to get in there, mainly because I watched all of my colleagues doing the study. If there is this amount of animal studies on tocotrienols, cancer studies were only this piddly amount.

Dr. Barrie Tan: Everybody talks about all the mechanisms of how tocotrienol works on cancer, but nobody is willing to do a trial. We decided that we're going to have to put in the resources. So we did and lucky for us, the Danish government decided to do four kinds of cancer, about six trials, ovarian, breast, colon and lung. Those four cancer. The ovarian cancer one is out and the breast and the colon cancer probably will be out next year. We will wait and see. The way they're designed is on stage four cancer patients, so the end stage, not a lot of options left. In ovarian cancer, I'll give you the short hand.

Dr. Barrie Tan: First, this is the fifth cancer killer. The five year survival rate is 50%, so the odds are not so good. The only thing worse than ovarian cancer is pancreatic cancer. That is just terrible odds. We have one group on the standard of care. The medicine is an anti-angiogenic drug. They cut off the blood vessel that feeds the tumor. So the tumor starves to death. Angiogenesis is the growth of blood vessels, anti-angiogenic cuts it off. It cut off the supply to the tumor because the tumor is growing like mad. They gave that medicine to the outset group.

Dr. Barrie Tan: The other one is the same medicine plus tocotrienol, and these patients are not expected to live much beyond six months. Those on tocotrienol had a 60% survival rate after one year. Even after two years, 25% survived. The other group, they are not there to talk about it. That, to me, is very promising. We redesigned the study on ovarian cancer, as the longest study that is ongoing. We don't know yet. However, the breast cancer study and the colon cancer study should be available next year. I can fill you in when that comes. So that's the ovarian cancer.

Wendy Myers: Those are just huge results because I've had two family members pass from cancers and a friend that did, also. If you have more time then you have a few more months to either spend with them or for them to do other things to turn around their health and reverse their diagnosis. That is just fantastic. You were going to tell us a little bit more?

Dr. Barrie Tan: That is more a marketing thing. If the tocotrienol were to be a drug, it would be all over Wall Street, but because it isn't, we publish it. By word of mouth or by podcast interview like this, we give out the information. We continue to work with the esteemed oncologist there. You can Google his name, very Scandinavic name, Anders, A-N-D-E-R-S Jacobson. So Professor Jacobson is the one that did this study very thoroughly, very mechanically, because he wanted to do it right. So do we. I'm not the one doing this study, he did it. He said, "Barrie, there's something here." That's that report. The study is over, but the patients that were on tocotrienol want to continue to take the tocotrienol, even though the study is done. The other group that didn't take it is not good. They are continuing to allow that, so that's good news for them.

Dr. Barrie Tan: I don't have anything more other than that. I would like to spend some time talking about fatty liver disease. I find this to be very encouraging. No disease is good, but we probably have 8 to 10 million people with cancer in the US. Like you said, there are about eight times more, 80 million people with fatty liver disease. Some people had excessive alcohol consumption, people were exposed to certain medication or some toxicity because of that and mercury that zapped the liver. Most of the 80 million people have fatty liver disease because of super high fat consumption and bad fat consumption. That's the one that makes all of us nervous. They simply won't have enough liver for a transplant, when people get to the cirrhotic part.

Dr. Barrie Tan: We are very happy that we decided about six years ago to focus on fatty liver. At the time it was lesser known. We first did a study for three months. We recruited the people and it's a double blind placebo controlled study. We didn't ask a lot of questions, then. The professor did c-reactive protein and triglycerides and then they measured the weight circumference, metabolic syndrome, a few things like that. It dropped dramatically, c-reactive protein dropped about 20 to 30%. Then he reported, "Hey Barrie, after three months this patient did drop 10 pounds." I said, "Wow. I don't know how to say this. I didn't know that tocotrienol is for weight loss." Then the professor said, "I didn't tell you it's for weight loss. They just lost weight over three months."

Dr. Barrie Tan: This is not a 10 pound weight loss over two weeks,"Oh, okay, I feel a little bit better." Then I said, "Can you check that a little bit more thoroughly on your six month study?" Now the six month study just got published. I'll tell you, in a six month study, they dropped about 15 pounds, at a dose of 600 milligrams. I don't know if your audience is aware of this, you can do a dose dependent study. You give them 100 milligram, 200 milligram, and 300 milligrams to see if there's any difference. Those are dose studies, but this is not a dose study. The dose is 600 milligrams for three months and for six months. We have an ongoing study for 12 months at 600 milligrams. They are time studies. They're time response studies. I'm going to show you. Can you see it?

Wendy Myers: Yes.

Dr. Barrie Tan: The top one is lifestyle change. We mean a low fat, low carb diet. There was a drop at three months, but it did not drop at six months. The blue line, see that?

Wendy Myers: Yes.

Dr. Barrie Tan: The last line is the one that takes 600 milligrams of tocotrienol. It dropped more dramatically and was statistically significant at three months, it dropped further. Wendy, this is very exciting.

Wendy Myers: Yes, that is. All I can say is I'm glad I'm taking vitamin E because I'm looking forward to that benefit.

Dr. Barrie Tan: The BMI dropped 5% at three months, 8% at six months and triglycerides dropped 10 to 15%, roughly. The fatty liver index, the fat in the liver, they can see on an ultrasound dropped 11% at three months and 15% at six months. Clearly, there's a time dependence. Then the CRP, everybody wants to know about the inflammation, 18% and 21%. Meaning that before they start taking it, 18% at three months, 21% at 6. So now we're doing a 12 months study. After this we will have very strong evidence. If the FDA allows, we're not making a drug, just that they allow a structure function claim. Of course, if they allow it, they're going to water it down, but at least I can stick it on the label. Now we cannot stick it on the label. I'm very excited about this. If this thing were to work for the NAFLD, where 80 million of our US population have it, it cannot be a bad thing. It can only be a good thing.

Wendy Myers: Absolutely. That's just in the United States because roughly 25% of people have metabolic syndrome and that's about 80 million people. I said a hundred million, but it's a ballpark. There's a lot of people undiagnosed. They may not have metabolic syndrome, but they have fatty liver. The same thing in Germany, they found that fatty liver disease has the same prevalence as metabolic syndrome. This is an issue around the world. I mean, there's hundreds of millions of people with nonalcoholic fatty liver disease that need these types of antioxidants. What I love about this is that most vitamin Es are suspended in a sunflower oil or another oil that's rancid.

Dr. Barrie Tan: Yes.

Wendy Myers: It defeats the whole purpose. The majority of vitamin Es you're going to take from the drug store or what have you, are all in sunflower oil or soybean oil. You need to avoid those like the plague. You have to read the label. This is the Designs for Health Annatto-E 300. Are there any other brands that have your particular vitamin E, that tocotrienols in them?

Dr. Barrie Tan: It's a yes and no answer. There are other brands out there. If this annatto is from American River Nutrition, and they would say DeltaGold, sometimes. It's a brand name. Some people use it, some people don't. But, Design for Health is the only company that has 300 milligrams, other companies have 125 or 50 milligrams.

We don't tell them what denomination to use. They make it themselves like that. At 300 milligrams, we have no vegetable oil. It's distilled, pristine and clean. You can see it's a very maroonish color. You can see through it, if you look at the soft gel. That's one component in it. I think the other thing that your consumer needs to know would be 95% of all the vitamin E out there are tocopherols.

Dr. Barrie Tan: Do not touch those tocopherol if you eat your normal food. You get your 10 to 15 milligrams of tocopherol. That's good enough for your body, but you need some tocotrienol. If you ask, "Well, doctor, just tell me what foods have tocotrienol?" I'll tell you, avocado pistachio, macadamia, not oily material. Do they have it? Not a lot. You can consume a huge amount of them, it would be insane, but those have it, corn oil has it. If you want to cook, just go on YouTube and look up how to cook with annatto. You'll get a few extra milligrams, but if you need 200, 300 or 400 milligrams, you need to do it from supplementation.

Dr. Barrie Tan: If you ever go to a botanical garden in a warmer climate, ask for the lipstick plant, annatto plant or the Bixa orellana. They used to have one in Galveston. Houston has one, Tampa botanical gardens have one, Southern California has one. Mostly warm climate botanical gardens have it. The coldest one is in the North. They actually send all the annatto trees inside the solarium in the Bronx Botanical Garden in New York city. Otherwise, they're mostly grown outdoors further towards the Southern areas.

Wendy Myers: One thing to know, as a general rule, you should not get fat soluble vitamins from supplements. Except for this, of course. The majority of the products on the market, multivitamins and other things like vitamin E are made from GMO corn. The genetically modified corn. It's very problematic that you mentioned the solvents involved in the extraction process of these fat soluble vitamins. You really have to be a conscious consumer, and a supplements snob. That's why you're listening to this show. This is the one to get, the Designs for Health Annatto-E 300.

Wendy Myers: Thank you so much for coming on the show. This is really informative. It's one of those things that I haven't been normally recommending to my clients, but I'm definitely going to be doing that going forward. I'm taking this myself. I'm really excited to see the results because liver, for me, is one of my weak points. I think it's a weak point for so many people. Taking vitamin E is really key for liver care, especially because it has so many jobs and it's under such a toxic threat. It needs support.

Dr. Barrie Tan: Let me say two things in passing. I won't take a minute. Since many of your listeners are interested in detox, most of the detoxing goes on in the liver. We cannot afford the liver to be compromised for detoxification. Anything that supports the liver is a good thing. Tocotrienol is a liver tonic supplement. I usually don't say that, but because your followers are great detox people and the liver is a very important organ to detoxify many things, anything that can help the liver is a good thing. Tocotrienol does that. Another time, I can send

you papers and you can interview me about it. We've also given these to people with hepatitis C, another liver problem. It's really a liver support supplement.

Wendy Myers: Fantastic.

Dr. Barrie Tan: Then the second comment I want to make is we just discovered something and it had to do with CoQ10. In the CoQ10, we're able to figure out how to use ubiquinone to become ubiquinol. Hopefully another time in the future, I can talk about a supplement ubiquinol. I know it's totally different, but I just put the cliffhanger there and maybe you can come back with Kim and talk about that. Thank you so much for inviting me. Hopefully, this is news and a message for your listeners out there. If they have any questions, they can send us an email. You can download a copy of my book, free of charge. Just go to my website and use the coupon code "myers detox" and then download the book. Most of the references are there. If they have questions, they can always send me an email. Thank you so much, Wendy. Be safe and be well.

Wendy Myers: Thank you so much for coming on. Why don't you tell us your website and where people can learn more about your work and download your book?

Dr. Barrie Tan: The website is simply just my name, Barrie Tan. Barrie is spelled B-A-R-R-I-E T-A-N.com. Once you come to the website, you have many options, Design for Health is one. They're the only one that has 300 milligrams. Other people have a lower denomination. That's a fantastic place to start. Once you get to the website, you can download the book. If there's any problem send us an email, we love to answer them.

Wendy Myers: Fantastic. Well, Dr. Tan, thanks so much for coming on the show. Everyone, thank you so much for listening to the *Myers Detox Podcast*, where we discuss every topic under the sun related to improving your body's ability to detox, heavy metals and chemicals. Thanks for tuning in. I'm Wendy Myers of myersdetox.com. You guys can get the free transcripts of these videos on myersdetox.com, just go there and search for podcasts and the *Myers Detox Podcast* and you'll find them. Thanks so much for tuning in and talk to you guys next week.