

NAME

114 - Navindra Seeram

DATE

June 12, 2020

DURATION

48m 29s

2 SPEAKERS

Navindra Seeram

Peter Bowes

START OF TRANSCRIPT**[00:00:02] Navindra Seeram**

I want to live to see my kids and my kids, kids and my kids kids kids you know I want to see my descendants and enjoy them and live a full life where I can can interact with them and be cognitively sharp.

[00:00:21] Peter Bowes

Hello and welcome to the Live Long and Master Aging podcast. I'm Peter Bowes. This is where we explore the science and stories behind human longevity. This episode is brought to you in association with Amazentis, a Swiss life science company that's pioneering, cutting edge, clinically validated cellular nutrition, under its timeline brand. Now let food be thy medicine and medicine be thy food. The quote attributed to Hippocrates the Greek physician sometimes described as the founder of Western medicine. That quote is often associated with the health benefits of a balanced diet on the rejuvenating power of food. Well, we're going to delve into that subject during this episode and find out more about chemical compounds known as phytochemicals, where we get them from and why they help us to stay healthy. I'm joined by Dr. Navindra Seeram, one of the world's leading experts in the science of plant foods and natural products. We're going to discuss why foods rich in certain compounds are hugely beneficial in preventing some chronic conditions and explain the concept of using plants as a first line of defense against harmful diseases. Dr. Seeram is a professor at the College of Pharmacy at the University of Rhode Island, here in the United States, Navindra, welcome to the Live Long and Master Aging podcast.

[00:01:47] Navindra Seeram

Hey, Peter, thank you for having me.

[00:01:49] Peter Bowes

It's great to talk to you. Difficult times that we're going through at the moment. I know everyone is working extremely hard, just getting used to a new way of working because of the Coronavirus. So I do appreciate you making time.

[00:02:00] Navindra Seeram

Absolutely. Peter, we have to adapt, right.

[00:02:02] Peter Bowes

This isn't gonna be over quickly, is it? So we've got to find that new way of of working. And you and I are talking obviously remotely at the moment. And it is amazing to me, isn't it, what we can do if we set our minds to it?

[00:02:13] Navindra Seeram

Hey, just like plants. You know, we adapt. We we coevolve. We we figure out ways to make things work. Necessity is the mother of invention, after all, Peter.

[00:02:24] Peter Bowes

Yeah, I quite agree. Before we delve into the science, I mentioned in the introduction that this episode is produced in association with Amazentis. And I wanted to give you an opportunity for the purposes of full disclosure for both of us to talk about your involvement with the company and the work that they're doing.

[00:02:40] Navindra Seeram

Yes. Peter, thank you for clarifying that. As you mentioned, I'm a professor at the University of Rhode Island. I'm also the department chair for the Biomedical and Pharmaceutical Sciences Department. But I also serve on this scientific advisory board independently from the University for Amazentis. And I'm also the co inventor of a patent from the University of California Regents on Urolithins, which has been licensed to Amazentis.

[00:03:10] Peter Bowes

And we'll delve into much more about that in a few seconds time. The science behind your Urolithin. But maybe let's talk a little bit about your background. First of all, I'm curious how you became interested in this area of science to start with.

[00:03:24] Navindra Seeram

So Peter I'm a third generation East Indian. I was born and I grew up in the South American country, known then as British Guiana. Now known as Guyana. I am a third generation East Indian. So my ancestors were brought from India to work in the sugar plantations after slavery was abolished as indentured servants. So growing up in a very poor Third World country such as Guyana, we had to resort to what mom and grandma would tell us to use as sources of medicines you know. Pharmacies and physicians was not - healthcare is not as accessible in Guyana as it is here in the United States. So as a very young kid growing up, a young child growing up, I was very piqued by the by their traditional systems of medicines that was practiced, you know, in India by the natives in Guyana. And therefore, you know, utilization of plants for preventing toothaches and tummy aches and so on.

[00:04:26] Peter Bowes

Yeah, I was actually just going to ask you if you can think of some examples maybe from your childhood as to where plants would come in and it almost became second nature to to turn to a plant if you had a toothache or if you had a bruise on your hand or little cut things that you might have instinctively used as medications.

[00:04:43] Navindra Seeram

Exactly. In fact, you know, if toothbrushes we didn't have toothbrushes at one point on and, you know, we'll take a black sage and, you know, we'll take it and rub it on your teeth and your gums. So there was a lot of different plants that mom and grandma would say to use. And, you know, in fact, Peter, you probably. Oh, that's the W.H.O., you know, estimates that over 80 percent of the world's population still use plants as sources of medicines in all parts of the world.

[00:05:09] Peter Bowes

My recollection from my childhood is when I grew up in northeast England and in a rural environment, and if I was stung by a nettle, I would immediately reach for a dandelion leaf to rub on that's not swelling on my hand. And the pain would go away instantly.

[00:05:25] Navindra Seeram

And it's also interesting, you know, Peter, that, you know, it's not only the things which you don't think about in terms of plants, stuff that are not edible. But there's so much in our medicine in terms of our spice cabinets, you know, garlic and chives and cumin and oregano and basil. And there was tons of stuff that mom and grandma would say, boil this drink this drink. Is it a tea or is it tincture or use it topically. So very, very fascinating when you think about plants and how they produce these phytochemicals, as you mentioned.

[00:06:00]

It is fascinating. So you were obviously hooked as a child in terms of your interest in this area. How did that evolve in terms of your education?

[00:06:08] Navindra Seeram

Right, Peter. So the University of Guyana, which is the only university that we have in terms of tertiary education, I went there and I got my bachelors in chemistry. And at that point, I realized that for me to pursue, you know, further discovery of natural products from plants that I had to go to grad school. And it turns out that in the beautiful island of Jamaica, in Kingston, Jamaica, there is the University of the West Indies. And they have and still do. One of the best programs, PhD programs in natural product chemistry. So I journeyed. I was young, I think, just finished college, 20, 21 years old, went over to Jamaica, taught in a high school for a couple of years, and then went to grad school and continued on my my my graduate studies and did my PhD there in Jamaica.

[00:06:59] Peter Bowes

And eventually found your way to Michigan State University.

[00:07:03] Navindra Seeram

I did, Peter. But one important, important point, I think, you know, sometimes here I don't know, your career chooses you or you choose your career. I don't know which which comes first is a chicken and the egg. But during my time finishing up my PhD, I work in forensic sciences in Jamaica. And it's interesting, when you work in forensics, it's not only looking at drugs and arson cases, but also toxicology cases of poisons or drug overdoses in humans. And therefore, my interest as a natural product chemist was not only about what's in the plants, but because of my, you know, exposure to forensic science kind of started wondering, you know, well, what happens when these phytochemicals get into the body just like toxins or poisons would do or dietary phytochemicals. What happens? And I think as you mentioned, by the time I hit Michigan for my Michigan State University for my postdoc and then went on after that, that kind of, I don't know, the convergence or the, you know, the coming together of the different ideas and curiosities that you have kind of molds you in your career as you move forward.

[00:08:13] Peter Bowes

That's interesting because I thought that is what science is all about, isn't it? It isn't just one thing. It's how different aspects of our lives, the natural world convergent with each other.

[00:08:23] Navindra Seeram

Correct, Peter? And it's so interdisciplinary right now, as you know, you know, science, you know, there is no chemist or biochemist anymore. We all kind of converge and we cross, cross, fertilize. And I think, you know, for me personally, you know, my background, you know, my ethnicity, my West Indian East Indian kind of mix, my moving to the United States to be exposed to cutting edge instrumentation, kind of shaped my career and still continues in the future, I'd say, as I move along this pathway.

[00:08:56] Peter Bowes

And I was interested in Michigan. You studied the properties of tart cherries and a lot of people today will swear on the use of taupe cherries for many, many reasons, including getting a good night's sleep.

[00:09:10] Navindra Seeram

Correct. So I did my postdoc with a very esteemed natural product chemist, Muraleedharan Nair, Professor Nair. And at that time, I still think still up to today, Michigan, the state of Michigan, is the largest producer and grower of tart cherries in the United States. So my postdoc project was, you know, working on the anthocyanins or the pigments which make cherries red and blueberries blue or strawberries red and pomegranates red and and the anthocyanins it turns out in tart cherries are very effective on inflammatory agents and tart cherries are widely used for gout and arthritis and inflammation. And it just kind of made sense that it was the pigments and tart cherries. They're actually partially responsible for some of those effects.

[00:09:56] Peter Bowes

You mentioned just going off a little tangent here, which is something I often do. But you mentioned the color of different fruits. Why? And we hear so much. Of course, these days about having a colorful, salad as being beneficial to us. Why is the color of a fruit or vegetable so important?

[00:10:12] Navindra Seeram

Important. Now, I'm going to go off to a tangent. Peter, if you'll just indulge me for a second. So it turns out, and I don't quote me on this, but it turns out that humans and birds were able to distinguish trichromatic. We were able to see a colorful berry against a dark leaf green background. And, you know, when I came to URI, I actually did a very cool collaboration with a fantastic scientist here from Natural Resources, Scott McWilliams. And we look at migratory birds that would fly, you know, when they're moving off, you know, coming from north, going south to Block Island, which is a small island off the coast of the New England area. And it turns so the birds, just like humans, would stop on Block Island. And they were able to at this time of the year, there's not much insects for them to eat. So they would they would consume large quantities of berries and they're able to distinguish and choose and select the more colorful ones. And I think our hypothesis and still worth investigating it is that the potential beneficial compounds from the berries that the birds would get and we do get kind of protects them. You know, they're their muscle and the inflammation that they're enduring as they fly, you know, they're superathletes. So for humans, I think, you know, as I just mentioned, you know, we coevolve with plants and maybe plants selected us to eat their colorful berries so that we could cultivate them. And we selected plants to grow them for their colorful berries so we could derive those held beneficial compounds that they produce. I don't know. It's a chicken and the egg again. But it's very fascinating when you think when you think of where that really close relationship we have with plants.

[00:12:02] Peter Bowes

It is fascinating in a sense to see how we have evolved and how birds have evolved to have that almost sixth sense to appreciate that different colors are beneficial for us.

[00:12:14] Navindra Seeram

Correct. Fascinating.

[00:12:15] Peter Bowes

So let's let's talk about phytochemicals. We've mentioned phytochemicals already, but let's delve into the science a little bit more. What exactly are they?

[00:12:22] Navindra Seeram

So phyto means plant. It's a Latin word, meaning plant. So phytochemicals are plant chemicals. Now, people don't like chemicals. They think chemicals are synthetic and bad for you. So there is a term that's coined, phytonutrients, and it's used alternatively to refer to phytochemicals. But these compounds that plants produce are non nutrients. In other words, plants, plants, produce, and we know plant diet is very healthy for us because it's good fiber and vitamins are there's some minerals or there maybe some good fats are there. But the compounds, these phytochemicals are secondary metabolites that the plants produce and they vary within the plant kingdom. Certain plants within a certain genus or certain types like the cruciferous, the cabbage family that produce a similar type of compounds are the berries that produce a similar type of phytochemicals. So the thought is that these phytochemicals are produced by the plant to give the plant a competitive advantage. So maybe I'm colorful, eat

me, dispersive my seeds or cultivate me. Or I'm toxic. Stay away from me. Right. Still, we do not eat my good. Eat my leaves. Herbivores. Or you going to die? Because you know I need my leaves. So we don't know why the plants produce them. But for some for sure, you know, the edible ones, the edible phytochemicals are the so-called quote unquote phytonutrients we know are potentially beneficial for us.

[00:13:55] Peter Bowes

So just to be clear and just to parse out the science that you've just been discussing there, when we say that they are secondary metabolites, in another words, they are not macro nutrients like fat, protein and fiber vitamins that people are very familiar with, yet they are still hugely important.

[00:14:15] Navindra Seeram

Correct. So they are not my macro nutrients or micronutrients. As you just clarified, these are not fats and carbohydrates and proteins and fiber or or vitamins and minerals. They are actually secondary metabolites. So they are not primary metabolites. They are produced, again, by plants in certain cases to potentially give the plants a biological competitive advantage. And humans, potentially, by eating these compounds, can get a beneficial health beneficial effect also.

[00:14:46] Peter Bowes

So when we talk about deriving essentially deriving drugs from natural sources like plants, what kind of medicinal compounds are maybe historically what kind of medicinal compounds are we talking about that are beneficial to us.

[00:15:00] Navindra Seeram

Yeah. You know, it's it's interesting, so phytopharmaceuticals are those drugs which are obtained from plants. And as you know, I work I teach in the College of Pharmacy. There is a discipline called pharmacognosy. And if you have not heard that word before, pharmacognosy is the quote unquote mother of pharmacy. It is where pharmacies started, where humans were learning how to take extracts from plants, their leaves, grind them up and actually use these for medicinal purposes. And as far as Eastern medicine and Western medicine kind of moved over time in the junior renaissance period, that's Hippocrates, as you mentioned and many other great scholars, humans started to figure out that by isolating individual compounds from plants that these could be developed into drugs. Very good examples. Aspirin. You know, that little pill that's been around for 100 years. It's actually a derivative of salicylic acid which is found in the bark of the willow. And in medieval in medieval England, when they, you know, they would chew on the bark of the willow and pain would go away. Inflammation would go away. And it was in a late later that scientists at Merck isolated salicylic acid, derivatized it and then aspirin was born. Similarly, there are other drugs like Digoxin the cardiac glycoside from the digitalis plant. There's caffeine from coffee or tea. There is a cancer drugs. Vincristine and vinblastine from the Madagascar periwinkle, nicotine artemisinin for anti-malaria, quinine. And the list continues. Tobacco. Nicotine right from the tobacco plant. So tons of tons of medicinal compounds. Of course, toxic ones to. I should clarify. Stimulants. Hallucinogenic compounds, psychedelic compounds. The lists just this is mind boggling.

[00:16:59] Peter Bowes

We are literally talking about thousands, aren't we?

[00:17:01] Navindra Seeram

Thousands. Thousands. And we're still discovering more. And, you know, it's interesting that the compounds exist naturally within the matrix of the plant. And sometimes when we cook the plant or or derivatives it like in a beverage or extract it, we actually modify and change some of these compounds, too. So it's not only what's in the plant naturally itself, it's also what we modify when we crush a garlic clove, for example. And so it's also how we consume them. And then it's also what happens when he gets into the body. Tight. As we referred to earlier.

[00:17:38] Peter Bowes

And as you imply, that it can sometimes be only certain parts of the plant. It isn't necessarily that the whole plant that is going to be beneficial to us. And I guess that's where the science is important, to identify which part of the plant, whether it's the seed or the pith or the the skin presumed react that is most valuable to us.

[00:17:56] Navindra Seeram

Correct, Peter. The components could be tissue specific. So what is in the fruit may not be what is in the leaves or what is in the bark. Like a cancer drug called Taxol. Paclitaxel is in the bark of the Pacific yew - that's another good example of a phytopharmaceutical. But yeah, you're right. So a fruit may maybe edible and the leaf may be a toxic of the same plant. There could be overlap or there could be entirely distinct in what what they contain.

[00:18:25] Peter Bowes

I mention that because people talk a lot about whole foods and I think there's a great value in talking about whole foods being beneficial to us. But we do need to know and understand the science to get the most benefit out of what we're eating because we could be misguided. I think sometimes perhaps in eating too much of a wrong kind of plant or too much of a certain kind of plant. And I mean, I'll give one little example. I went through a phase in my life because so I thought and I believe still that almonds are very good for you. Nuts generally are good for you. If you eat too many almonds, perhaps you might be getting too much of a certain compound that can result in kidney stones. Yeah, you got to be careful. And that's where education is so important. Isn't it?

[00:19:12] Navindra Seeram

Correct? Yeah. In fact, almonds contain a compound called amygdalin. Amygdalin is a cyanide-containing molecule. It's found in certain other plants like like Yucca or Cassava. And in Africa and South America, where I grew up mom, they would boil cassava and throw away the water before consuming the cassava so that we kind of figured out how to get rid of a non-toxic stuff from foods. Very fascinating. When you think of pharmacognosy, and the evolution of traditional systems of medicine like TCM, Traditional Chinese Medicine or Ayurveda, the Indian system of medicine and how we practice Western medicine, you know, with with the traditional systems of medicine being very personalized and, you know, with meditation being a part of it and a healthy lifestyle and exercise, it's very holistic. You know, it's it's it's the whole food, as well as a holistic approach to health and to your show here, Peter, LLAMA. You know all about the healthspan and lifespan. And I'm speaking to the expert right now.

[00:20:14] Peter Bowes

Well, that's very kind of you. That is exactly what we are all about. Living long and healthspan is the phrase that I use all the time, of course, living as long as possible, just optimizing the number of healthy years that we have.

[00:20:25] Navindra Seeram

That's right. Peter,

[00:20:27] Peter Bowes

Let's talk about pomegranates. You have written a book about pomegranates. You you mentioned them earlier and very, very coincidentally to this interview. I today just ordered three pomegranate trees for my garden, happened to be doing a bit of landscaping because we were hit by a fire a few months ago - a California wildfires - so replacing a few trees and pomegranates actually survive very well in southern California. The climate really suits them. So I have got a special interest in Pomegranates, for maybe more than one reason, but you are an expert in terms of their medicinal qualities. What drew you to them as something that you wanted to study?

[00:21:08] Navindra Seeram

Yes, Peter. So as we mentioned, you know, I finished my postdoc at Michigan State. I was working with tart cherries. And then I moved to UCLA, University of California, Los Angeles, right in your backyard, I think, Peter, I work with a very famous physician. He's also a PhD. David Heber. And at that time, you know, as you just mentioned, you know, pomegranates were really hitting the United States big time. So as we all know, or we may not know, it's really a Mediterranean plant. It's from Persia. That's where it was originally grown. And because California has its beautiful Mediterranean temperature, pomegranates grew very well in the beautiful state of California. And POM Wonderful a company at that time that was producing pomegranate juice, squeezing the whole pomegranate fruit. You know, we're very interested, you know, with with our group at that time and kind of understanding, you know, what were the health benefits of of pomegranate juice. And so that was where our work really started in terms of understanding the chemistry of what's present in pomegranate juice, as well as, you know, what happens when the components get into the body.

[00:22:32] Peter Bowes

And there's a long history, of course, and pomegranates are mentioned in many religions. The records of their use go back centuries.

[00:22:41] Navindra Seeram

Yes, it's mentioned in all of the holy books, in the Bible, in the Koran and the Torah. It's supposedly the apple in the Garden of Eden. You know, it's regarded as a king of fruits. It has a crown on it that you think about. You know, you look at a pomegranate. It's the only species in its family. So the plant itself, it's the only member of its whole family. So that's pretty interesting, also. A *Punica granatum*. It means like a grenade. And if you were to cut a pomegranate open, you'll see the juicy sacks of those arials, the edible part of the fleshy coat around the seeds, which if you were to eat those, you're consuming these anthocyanins, which are the compounds we mentioned earlier, found in cherries and berries. But it's also interesting when you look at the chemistry of the pomegranate that the pith. So if you were to cut it open, that white part of the of the fruit as well as its peel or its husk, that leathery rind also contains a large quantity of polyphenols that are known as ellagitannins. And therefore, if you were to squeeze a whole pomegranate fruit to extract its juice, you're actually squeezing out, you know, not only the anthocyanins that give it a beautiful red colour, but also these ellagitannins or polyphenols, found in the peel of the fruit.

[00:24:07] Peter Bowes

So it is a good example of the entire fruit being beneficial to us and different qualities, depending whether we're talking about the pith or the juice, depending on how it's used?

[00:24:21] Navindra Seeram

Correct. And you could imagine one would not eat a pomegranate rind. It's bitter, but, you know, imagine squeezing a whole orange. So compounds in the in the peel of that whole orange would also be extracted into orange juice. I think it's a similar analogy here. And whilst we may think that pomegranate peel may not be edible, the Indian system of medicine Ayurveda, they would use anardana the spice that was obtained from pomegranate seeds and also its rind. And I've also heard anecdotally that if you were to go to certain parts of Turkey and Middle Eastern countries, Persia. They would take the pomegranate fruit and then they would kind of massage it and soften it to a

point where they could stick a straw into it and then drink that juice. So, you know, they're consuming what's in the peel into that juice. If you kind of soften and roll that fruit around.

[00:25:14] Peter Bowes

So let's just extrapolate a little bit then in terms of what happens when we eat pomegranates and why and how it is beneficial to us, because we all respond in different ways, depending on what's going on in our guts. And we were all different as human beings. So how are we benefiting and scientifically what is going on when we eat a pomegranate?

[00:25:37] Navindra Seeram

Correct. So, Peter, as a pharmacy professor, you know, we teach our students or pharmacists about ADME, you know, pharmaceutical science students about ADME A being absorption, D distribution, M metabolism and E excretion. And when you think of drugs or xenobiotics or foreign substances, it enters the body into your, through your mouth as it gets into your stomach. You know, these compounds are actually exposed to high pH, I should say, high, low pH, high acidity and many of the components as degrade into are broken down into smaller molecules, which are then absorbed and gets into circulation and then they're distributed and metabolized by the liver enzymes. So what may end up into the bloodstream may not be what's actually in the fruit itself as well, as you just alluded to, compounds that are then traversing from the stomach and getting into this small and then large intestine. And they would sit in the large intestine for a while and then there further are now metabolized by gut microbiota, the gut microflora. I think the last of heard, there's over 100 trillion different types, not species, but a lot of bacteria in your gut and which depends on an individual. So.

[00:27:00] Peter Bowes

That's a mindblowing number, isn't it?

[00:27:01] Navindra Seeram

It is. It is. It is a and and as as people know, you know, you if your gut is not right, then you're not right. And, you know, with inter individual variability, not only in genetic polymorphisms, but also in your gut microbiota composition, you could imagine that one could probably probably, you know, break down these compounds differently than not than your twin would, you know, or or your your brother would so fascinating.

[00:27:29] Peter Bowes

And the impact on us can be whole body, including the brain?

[00:27:33] Navindra Seeram

Correct. Because once the compounds are metabolized into different sizes or different forms, some of them can actually cross the BBB, the blood brain barrier, which is this thick, waxy layer that protects the brain, you know, from circulation. So some components could could get into the brain. They could get into other tissues of the body. You could excrete them and pass them into your urine and feces. And you could get into this what's called enterohepatic circulation to where from the colon on the compounds are absorbed into circulation, converted again by the liver enzymes and then discontinuous flux of of compounds circulating. If you're consuming, you know, pomegranate juice, for example, in a regularly or green tea irregularly or red wine regularly or eating your nuts and berries regularly.

[00:28:22] Peter Bowes

So let's get to the heart of the matter with urolithin A, which which you've mentioned. But let's delve into that in a little bit more detail. And it's one of the metabolites that we can get from pomegranates and we need the right bacteria to reap the rewards. Can you explain the process?

[00:28:42] Navindra Seeram

Yes. So the dilemma that we had and we still do as a field in our scientists in the field of polyphenol chemistry is sometimes we cannot explain the physiological effects based on levels of compounds you will find in circulation. So in other words, you know about polyphenols, ellagitannins included, are generally regarded as being very poorly bioavailable, meaning that the compounds are not being absorbed into blood in large quantities or physiological level relevant levels to to see a biological effect. So the dilemma is, well, if what's in the fruit is not getting into the blood, then what's responsible for the health benefit or the health beneficial effects of what is known for the for the fruits? Traditionally and also in modern science. And, you know, it was not our group alone. There was other groups working in this area and it was. And this is not only for ellagitannins. I can expand on that later on. It's for also other classes of polyphenols. But it turns so that ellagitannins, as they as they get into the into the colon and they're exposed to the colonic gut microbiota. Some of these gut microbes are able to break down or convert these polyphenols, these ellagitannins, into smaller molecules such as these urolithins. In the case for ellagitannins which are formed and the urolithins include a host of urolithins, one of them is urolithin A there's also urolithin B, C, D, and so on, urolithin A is the most abundant and prevalent among the urolithins. But again, you know, if you do not have the microbes which are are able to do that conversion, then you wouldn't be a responder or a producer of urolithins. If that makes sense?

[00:30:42] Peter Bowes

So we're not all responders, then?

[00:30:44] Navindra Seeram

We're not all responders. So it's interesting. I know I'm a responder because it turns out, you know, in some of our earlier studies, I'm able to detect urolithins, you know, in my urine using mass spec methods. If I consume pomegranate. But no, we're not all responders. You have to have that gut microbe that the microbes that do the conversion and we don't know what percentage of people are responders or who are not. And we don't even know if a non-responder can become a responder if you consume foods over time. So there's a lot of unknowns about urolithins present in humans from the consumption of ellagitannin-rich foods.

[00:31:23] Peter Bowes

And is it black and white? You're either a responder or not. Or can that be gradients? Can you be a partial responder?

[00:31:29] Navindra Seeram

Yeah, it's it's it's very it's you could be a responder or not and you could be a responder to some types of urolithins or not. I you know, I think what needs to happen is a really large clinical study that really looks at people with different, you know, consumption consuming the ellagitannins and then really trying to understand how much we produce, what we produce, who is a responder who is not. A lot of unknowns.

[00:31:57] Peter Bowes

In terms of testing to find out if we are a responder. What does that involve?

[00:32:02] Navindra Seeram

Well, it would involve, as I just mentioned, in collecting some urine samples after you've consumed the ellagitannin-rich food.

[00:32:09] Peter Bowes

Right.

[00:32:09] Navindra Seeram

Or pomegranate in this case. And then and then finding the urolithin glucuronidated form because it's excreted in your urine. Also, there's some blood samples that people looking at. I know. We'll talk about this later. Amazentis, a company, the Swiss biotech company, they have they're developing methods to actually diagnose and find out quickly if you're you're if you're producing urolithins or not.

[00:32:36] Peter Bowes

Just to talk a little bit more about the benefits of urolithin A. It's mitochondrial health that is so crucial. And because of course mitochondrial health is vital for all of us every day in terms of our energy?

[00:32:47] Navindra Seeram

Correct so the mitochondria is the power, the power house of the cell. And urolithin A is actually an activator of mitophagy. So it actually helps the recycling of dead my mitochondria and then improves in a cellular function, which has been shown in several studies in worms and nematodes, *C. elegans* and also in in rodents and there's some emerging human clinical studies to also support the effects of urolithin A, in muscle function.

[00:33:19] Peter Bowes

And that's why it sometimes gets the label anti aging. And that's an expression I don't like. I don't believe in anti aging. I think positive aging is perhaps a more useful expression or simply aging well, but nevertheless anti aging, because we can be 70 years old and have good muscle strength and perhaps feel like we're 50 years old and mitochondria are obviously crucial in that process.

[00:33:43] Navindra Seeram

You're right, Peter. That's correct.

[00:33:46] Peter Bowes

So let's move on to, and you mentioned the work that Amazentis are doing, and the product Mitopure urolithin A, what is the distinction between a highly pure and proprietary form of urolithin A and the urolithin A we've just been talking about?

[00:34:05] Navindra Seeram

Right. So as I mentioned, Amazentis is a Swiss biotech company. And, you know, when we started, you know, talking about more than 10 years ago, they were quite interested in in what were the health benefits of what's in pomegranate. And as they narrowed down and look at urolithin A and have published, you know, some really good papers on the compound, as I mentioned, in nematodes and in animals, in rodents and also in humans, is that they have developed this Mitopure which is a proprietary formulation of your urolithin A, which is highly bio available. So it's not like you could go and buy your urolithin A from Sigma, a chemical company that sells urolithin A, because you wouldn't be able to, first of all, dissolve it and consume it and then it wouldn't be bio available, but Mitopure, that's that's a developed by Amazentis, has been shown in clinical studies, to be effective, to be bioavailable, to be safe and tolerable in humans. So it's, you know, it's well tested. You know, it's an effective product.

[00:35:14] Peter Bowes

And I was a product. As a scientist, is it something that excites you for the future?

[00:35:20] Navindra Seeram

It is. Because, you know, at the end of the day, you know, if you want to get the best benefits from your foods and you have so much uncertainties in what you're eating or how you're processing it, or are you able to produce it? Are you a responder or non-responder? And there's so much unknowns because it's such personalized that the best bang for your buck is really to get to the actual compound, which is bioactive. And if there is a way that you could consume Mitopure and then get the benefits directly of Urolithin A irregardless or irrespective of if you're a producer or not. Or you just don't like pomegranate juice or you don't want to eat berries or you want to supplement and you want to get bioactive levels of the compounds in a sufficient dose, then I think let's cut to the chase and get exactly to the bioactive component. That's what Amazentis this is providing in the Mitopure product.

[00:36:16] Peter Bowes

Yeah. And I asked that question because I, and my views on supplementation have evolved over the years, and I used to be from the school of, well, if we eat a balanced diet with good fruits and vegetables, organic foods, wherever possible, that we are probably getting enough of everything that we need in terms of vitamins and minerals and proteins and fats and carbohydrates, that we're probably going to be okay and that we don't need supplementation. Now, I've evolved to the point and this conversation helps to explain how complex we are as human beings and how even with that, let's say in quotes, perfect balanced diet, we may still not be fully benefiting from the natural foods. And therefore, as we understand further the science, the supplementation. It's almost like an insurance policy to fill in the gaps of what we're not getting from the natural world.

[00:37:11] Navindra Seeram

That's right. You know, you hit the nail on the head there, Peter. It's like an insurance policy because supplementation. Dietary supplementation is meant to supplement, not to replace. And as you just said, indeed, you could be consuming a wholesome diet. But if you're not a responder, then you wouldn't be producing urolithin A and if urolithin A is one of the constituents or one of the bioactive compounds that's formed in humans - and we've shown that that has a health benefit -then supplement with it because you may not be getting it from your diet.

[00:37:44] Peter Bowes

I'd like to just maybe broaden the conversation out a little bit more now and get your thoughts on personalized medicine. In other words, medicine directed as an individual. And as you've explained, we are all supremely different in terms of how our bodies work. And there's a lot of talk these days about personalized medicine. How much do you think that is part of our future?

[00:38:07] Navindra Seeram

I think it has to be because, you know, there's no one size fits all. And as I alluded to earlier, the view of traditional systems of medicine like TCM, Traditional Chinese Medicine or Ayurveda, you know, if you were to see a practitioner, they would actually look at you, Peter, and stick out your tongue and look at your eyes and and give you a diet that includes herbs and other things and have it's really structured for you. It's for Peter Bowes. And I think we're finding now that in the field of drugs, at least in cancer, chemotherapeutic drugs, for example, where you may have certain genes that makes you more in a liable, are prone to getting a certain predisposition to a certain type of cancer and other drugs that may work for certain people. It may not work for other people. And I think you could extend that personalised new precision medicine and personalized nutrition to what we're talking about with these phytochemicals, because, again, because of our genetic predisposition or polymorphisms, the stuff that we have in our gut, the gut microbiota, maybe what's good for Peter Bowes is not what's good for Navindra Seerum. Maybe I could eat green tea and drink green tea and eat broccoli and eat pomegranates. And I'm responding and I'm producing different things. And Peter Bowes just lacks those microflora and is not able to. And so I think it's very interesting, again, that therefore what's happening with drugs may also be the same for for foods and whilst we don't understand everything as yet, ellagitannins are not the only compounds which are converted by gut microbiota into further metabolites. There are other classes of polyphenols that's been well known - lignans which are found in flaxseed, even tea. Compounds in tea. So it's not it's not just ellagitannins that go through this conversion by gut microbiota. It's other polyphenols also and other phytochemicals also. So we really had the tip of the iceberg. And there's so much that we do not know what Amazentis has done here, advancing Mitopure, to a point where we can actually consume the product, is really forging, I think, pushing the barriers forward faster. And I think this is just a trend that's gonna have to happen as we understand more about what's really beneficial in the body and what's getting to the tissues and what's exactly we need, which may be quite different from what's in the food itself.

[00:40:41] Peter Bowes

I think one of the challenges ahead is going to be in terms of sharing the value of this science with populations at large, with society, is making the benefits and these supplementations affordable for a vast number of people because that is, of course, the great ills of our society, that a lot of diseases can be prevented, en masse, if only people could afford the foods and the medicines that can do that. We understand what's needed. We understand the science, but it's the availability to vast numbers of people that's increasingly important.

[00:41:21] Peter Bowes

Correct. Because if even if you were a responder to get back to our analogy of doing exactly what you said there, Peter, you know, you may not want to drink pomegranate juice because it has sugars and you may have diabetes and you don't want the calories and the sugar. That's coming with that food itself. Or if you're eating the fruits and you don't want to eat a rind or maybe someone who wants to take out a pomegranate extract, you don't know that extract is standardized. You don't know where it's coming from. It's not been clinically tested. So what ultimately, exactly right. How do we get bioactive compound to get to most people in a very convenient form, in a form it's calibrated and known to be bioavailable, affordable. And those are some of the things that we have to think of globally.

[00:42:11] Peter Bowes

And I think one of the other challenges is, is simply education, because we are often times more often than not, indeed, look at television advertising, bombarded with information about what is supposedly good for us, what's not good for us, what is affordable. And people, I think quite rightly, are often so deluged with information that they are confused about what they should be eating. And for us to move forward and to benefit the most number of people, education really does have to be focused on advising people what they should eat and why they should eat it.

[00:42:46]

Correct, Peter. I know education starts. You know, I'm a professor. I am a teacher first and foremost, as well as a researcher. So it starts in the classroom. It extends into the lab, into my grad students and postdocs. And it also entails me going to scientific meetings and presenting not only to my peers, but also to the lay persons too, to trade meetings, to dietician meetings, to meetings, which, you know, we wouldn't be able to get to the masses doing podcasts such as yours. Right. Right. No, Peter. So we're educating the folks who are listening. Listening in. And I have to admit, you know, we don't have all the answers. We're still learning. But what we know now is more than we know we do more than we knew yesterday or ten years ago. And what we'll know ten years from now is more than we'll know today. So this is just a building logically on the next steps of what we're learning to ultimately get the bioactive constituents to humans to to have them, you know, have a better health span and lifespan.

[00:43:47] Peter Bowes

And this is why science and the funding of science is so important.

[00:43:51]

It is. And, you know, with without the funding, you know, where do you get the money from to do these clinical studies? And I know I'm actually excited and happy that, you know, a company, a biotech company like Amazentis, can really push the boundaries faster and further than if we were just trying to rely on just federal sources of funding. You know, however, we get to that point to know if it's pharmaceutical companies, if it's biotech companies, if it's dietary supplement companies, if it's food companies. But, you know, the science is good, the science is peer reviewed and it's been published and vetted. And therefore, it's good science, good science, is good science. It doesn't matter where the funding comes from.

[00:44:32] Peter Bowes

And in the meantime, we we move forward with the knowledge that we have. And one of the rules of thumb that I often use when I don't fully understand the implications of eating a certain diet is to keep it simple. And I'm one of those people have a really simple diet and I don't eat much meat, but I eat a lot of vegetables. And 'if in doubt, leave it out,' is generally my motto when it comes to food. I'm just curious as to what you. do in terms of your own.

[00:45:00] Navindra Seeram

Yeah.Peter, you said at the very start, you know, you are what you eat. You know, let food be thy medicine and medicine be thy food. I'm a big proponent of high plant based diet. I integrate a lot of fruits and vegetables in my diet. My wife, she's ethnic Indian like me. We're West Indian. She grew up in Jamaica. So there's a lot of spices in our foods and curries and hot pepper, capsaicin. I drink a lot of coffee and red wine moderately, of course. But yes, you know, I tried to educate my kids in their palates and what they were exposed to when they were kids so that they can kind of learn to enjoy the taste of good foods, you know? I came URI, about eleven years ago, I started working in maple, you know, and tried to understand what's different with maple syrup. It's a not a conversation for another day versus a pancake syrup. So the natural foods versus this, you know, these processed foods. So, you know, you can never get it right. But as you just said, Peter would try to keep it simple, you know, and do the best that we can.

[00:46:10] Peter Bowes

And how much do you think about your own health span? I often ask that question to experts in the field of longevity science. And so it's always interesting to me the answer in terms of how people like you apply the science that you yourself are working on to your own life, perhaps with 30 or 40 years in the future in mind?

[00:46:31] Navindra Seeram

Well, I'll tell you this, Peter. Thank you for asking that. It's a very personal question. As you know, I'm in my early fifties. I just outlived my dad. You know, for males in my family growing up in a poor Third World country. their lifespan is not much. No, they there's no dental care, health care, exercising the diets that we know now, you know,

it's not what they were used to. And so for me, you know, living longer than my dad has lived. You know, I want to, I want to live to see my kids and my kids' kids and my kids' kids' kids. And I want to see my descendants and and enjoy them and live a full life where I can interact with them and be cognitively sharp. It's okay if I don't remember where my car keys are, but to have those beautiful memories. And for me, you know, that's what's important because I, I think that everything that I can do right now to give me an extra day to spend with my family is worth it.

[00:47:33] Peter Bowes

I think that's a wonderful way to end this. Navindra Seeram, thank you very much. Really fascinating conversation.

[00:47:39] Navindra Seeram

Peter, thank you for having me. It was really a pleasure talking to you, too.

[00:47:43] Peter Bowes

And if you'd like to read more about Dr. Seeram's work, I'll put the details in the show notes of this episode. You'll find them at the Live Long and Master Aging website. We use the acronym LLLAMA so it's LLAMA podcast dot com - LLAMApodcast dot com. This episode of the LLAMA podcast was brought to you in association with Amazentis, a Swiss Life Science Company pioneering cutting edge, clinically validated cellular nutrition under its Timeline brand. If you enjoy what we do, you can rate and review us at Apple podcasts. You can follow us in social media at LLAMA podcast and you can direct message me at Peter Bowes. Many thanks for listening.

END OF TRANSCRIPT



Automated transcription by Sonix
www.sonix.ai