Danny Lennon: Professor Julia Rucklidge, welcome to the show.

Julia Rucklidge: Oh, well, thank you for having me here.

Danny Lennon: No, it's an absolute honor to have you on. Just looking at the breadth of work you've done and the kind of esteem you've held within the scientific community is actually, like I said, I'm honored to have you on. And I'm really interested to dive into a lot of the research that you've got going on and a lot of this stuff that I've come across basically going in this rabbit hole of finding this thread of research that you've put out, but maybe before we get into any of the specific studies, just to kind of give the listeners a bit of context, could you maybe talk them through the work that you're involved with at the moment, the research that you're doing and really what's the aim of you and your colleagues with that research?

Julia Rucklidge: Sure. So just to give you the background of why am I doing this kind of work in the first place. As a clinical psychologist, this isn't typically what a psychologist would do, which is looking at the use of nutrients for the treatment of mental illness. But it wasn't long into my career, which is sort of in the…I started…I got my postdoc in 2000, so I've been in New Zealand now for 16 years, but it wasn't long into that where we were doing research and I was reading all this literature and, you know, just sort of recognizing that despite receiving conventional treatments, people were simply not recovering to the fullest of what you'd expect. That is, you'd

expect people to recover from mental illness using conventional treatments in that people should be normalized. If the treatments are working, if medications are working or psychological therapies are working, then people should be back to a really good standard following receiving treatment. And the research doesn't stock up to suggest that that's actually what's happening. Many people simply aren't recovering or many people are left on disability as a consequence of their mental illness but also, even despite receiving the frontline treatments, they still are not functioning as well as they could and they are unable to work. So, as a society, I think we need to stop and recognize that this is what's the state of the scene at the moment and that we do need to be exploring other ways forward.

And so I heard about families treating themselves with micronutrients back in…actually, when I was doing my PhD in Calgary in 1997-1998, my supervisor had been approached by some families—her name's Professor Bonnie Kaplan—and she heard about how they were using nutrients. Now, she decided to explore that a little bit with some very small studies back in the early part of this century but there were a lot of challenges to doing this work and she ended up facing a huge number of obstacles by Health Canada, which resulted in her being unable to complete some of the studies that she was doing. So I decided to have a look at, you know, as scientists, well, that's our job, we are supposed to explore things that come along. If somebody is making claims that nutrients can treat mental illness, then that's something that we need to put to the test and that's what I've been doing now for 10 years. It's been quite a journey, a very interesting one, very unexpected in terms of some of the challenges that we've come across but really, really rewarding in that many people have their lives changed by nutrients and many people recover from mental illness who hadn't previously recovered. So that piece is just really exciting and why we keep going with the work.

Danny Lennon: Yeah, that really is awesome and we're definitely going to dive into some of that work, and obviously some of those obstacles I'd like to bring up later on as well. But maybe a good way for those listening who maybe aren't as familiar, when we talk about this in terms of micronutrients as a treatment or an adjunct to a treatment to help with any of these mental health issues or certain psychiatric disorders, when it comes down to what the standard narrative up to this point has been in terms of maybe medication as a kind of first intervention or so to speak, what is that

standard narrative that has been around dealing with such disorders that is different to what you've been looking at?

Julia Rucklidge: So the standard that, I mean, at the moment would be antidepressants and anxiolytics, antipsychotics. Prozac, Fluoxetine—the names vary depending on where you live but I'll do my best to just sort of cover it, venlafaxine or Effexor—those are antidepressants. Paroxetine would be another one that's being used quite widely over the last couple of decades. Antipsychotics would be things like Risperdal, quetiapine. I know they probably go by different names and I'm trying to think of them in Europe but I'm not sure what they are. The benzodiazepines would be the common anxiolytics that have been used and those are the sort of calming agents. So they certainly made a big difference when they came out. Pharmacotherapy has been in use widely now for 50 years or so. I mean, in the area of ADHD, which is the area that I studied the most and Ritalin has been around for a long time or methylphenidate. So they're all typically single molecule, so that means that we are tackling the problem with just one molecule that seems to make a difference particularly with neurotransmission and so they affect dopaminergic system or the serotonergic system or GABA. So that's their target and that's sort of the method that we've used now for the treatment of psychiatric disorders for the last 50 years. It's targeting the neurotransmitter systems.

Now, the challenge has been to actually determine whether or not people had any deficiencies or differences in neurotransmission to begin with. The understanding and assumption over the last few decades has been that people have deficiencies in, say, serotonin, and therefore when you're given Prozac that corrects it. But there hasn't been any really good evidence that actually has supported this theory, and that's been unraveling over the last decade and been really challenged by many people from all fronts saying, "Well, hold on, these drugs are not actually correcting something that is wrong. They're definitely having an effect on the brain but they're not having the effect that we thought that they were having." And so that's been quite an eye-opener for a scientist to sort of appreciate, "Hold on, this is not working the way we thought it was working."

And one of the things that has also been coming out over the last, again, very few number of years, I might even say five years, maybe it's been going on for a bit longer than that but not much longer, is the data that's coming out suggesting that there are some serious long-term consequences for many people when they take these medications. Again, I don't want to let your listeners think that it's everyone. Many people of course have been

benefitted from medications and continue to do so. But when we look at a population level, that's when it…we need to be honest about the fact that many people are not recovering and also it may be detrimental for some people in the long-term.

So that's our conventional model. So that's where I come along with our research, which is not tackling the problem at all from that single-ingredient approach but taking the approach that if we provide the body with all the nutrients that it requires, so the vitamins and minerals and amino acids that it requires in order to function optimally, that we're going to give the body the building blocks such that it can make those neurotransmitters, it can ensure that our mitochondria are well-fed such that the mitochondria can do what they're supposed to do, which is producing ATP which is required by all cells in our entire body. So we're providing those nutrients such that the body can do what it needs to do.

Danny Lennon: And so you mentioned there maybe a couple of the potential mechanisms and what we're looking at underneath that. So the first thing that would come to mind is, are we seeing that someone who has a nutrient deficiency which maybe exacerbates an existing condition then having this positive response to micronutrient supplementation because we're eliminating the deficiency or is there just more going on besides that?

Julia Rucklidge: Yeah.

Danny Lennon: Is it possible that they see a benefit from higher levels of these nutrients than we typically deem “normal?”

Julia Rucklidge: Right. Really great question but a hard one to answer and we're not sure how it affects different people. So we do wonder whether or not—it's sort of a…it's a shotgun approach. I mean, that is what we're doing here. We're giving a whole host of nutrients. Each individual may not necessarily need all of those nutrients but fortunately our bodies have evolved to be able to deal with nutrients. It's what's in our food. And so we know that when we don’t need any more, say, specific vitamins, then we'll simply eliminate those and our bodies are well-adjusted to be able to do that, as opposed to medications which are foreign and our bodies do not necessarily know how to eliminate those adequately.

So different people may be benefitting for different reasons. So it might be that some people are responding to the fact that our food is no longer as nutritious as it used to be. There's very good research that indicates that our food is more nutrient-poor compared to how it has been in our past

and so some people may not adjust well to not receiving as many nutrients. Some people may do perfectly fine with a reduction in the nutrients in their food, but some people who may have vulnerabilities, they may be genetic vulnerabilities, not sure, but it means that they start to express illness when the quality of the food goes down.

Now, that's of course speaking about good food, even eating good food that may be more nutrient-poor, but of course we also appreciate now that people's food habits have changed massively in a very short period of time in terms of what they're eating, so we are now…people are eating far more processed foods, what we'd like to call the Western diet – high in sugary drinks, high in processed foods, low in fruits and vegetables, high in takeaways. That type of diet is probably quite detrimental to our health and indeed, when I say that, probably there's good research now that's shown, you know, epidemiological studies both cross-sectionally and longitudinally from all over the world are all showing the same thing, which is that the Western diet is simply not good for our mental and physical health.

So there's that change in our food intake. There's the potential that the soil is not remineralized properly such that we don't have as many nutrients in our food. There's also the use of herbicides like glyphosate that have been shown to reduce the, again, leach the plants of essential nutrients. There's certainly research that's shown that. So there's a lot of factors that are going on, and then of course what we bring to it, which is our genetics, our biochemical individuality that also means that people are going to respond differently to changes in our diet. So there's all of those factors that are going on that different people are maybe responding for different reasons and we're simply providing, as I said, all the nutrients so that people can use the nutrients that are given in order for their bodies to ultimately recover.

Danny Lennon: Yeah, and I'm really glad you bring up the concept of biochemical individuality because I think it actually leads onto something that I realize is going to be maybe a very open question, something we probably don't have answers to right now. But just in terms of what you think of that, do we have any indication on whether it's a case of low nutrient status simply making a disorder worse or could the root cause of development of the issue actually hinge on past nutrient status and diet and possibly going back to someone's, say, childhood or even if we take that a step further and then start looking into, say, epigenetics and tracing it back to the mother's diet while the child's in utero?

Julia Rucklidge: Yeah.

Danny Lennon: Is there any of these questions that you even have an inkling of where we might lie or could they potentially play a role?

Julia Rucklidge: Right, great avenues for research. As far as I'm aware in terms of the research that we're doing to try to uncover this, we don't know a lot about what might be going on in terms of that epigenetic phenomenon. We are currently looking at that in our own research. So, for example, we have a study going on right now with children with ADHD where we are providing an RCT, so double-blind randomized control trial. Half are getting micronutrients and half are getting placebo, and we're monitoring them over a 10-week period while they're blind to what they're taking. But we are collecting DNA off of these children, and so we'll be able to maybe answer that question and look at…and it's going to be one of the first studies that will have looked at this from my knowledge, which is if you give people these nutrients, does it have an epigenetic effect? Does it change the genes? Does it change the methylation in those individuals who are exposed to the nutrients? It's a big unknown but it's something that we're really keen to explore. I suspect we're going to go down a lot of dead ends before we ever see anything. I think we may think that that sounds a little bit too simple potentially that we could change the DNA in such a short period of time. Maybe we need to follow them over a much longer period, over six months, a year after exposure to the nutrients.

Of course, the other thing you're dealing with is that these people may be a bit different genetically because they have ADHD. Again, we're at such early stages of understanding the genetics of ADHD. Lots of genes have been put forward but overall the research hasn't been able to identify any candidate genes that can explain a huge amount of variance in the expression of ADHD symptoms.

So it's exciting to look at the biology and to understand why these nutrients might be working, but at the same time one of the focuses for me actually, and it goes back to some of the controversy that I alluded to earlier, is that we need to establish that this is actually a viable way forward, doing...we've done randomized control trials in our study and our lab and we've shown that the micronutrients are an effective, efficacious and safe way forward for the treatment of different mental disorders but we're still in early days on that. So I really do also just want to collect the type of data that shows that this is a viable way forward for us to start investing in it because there's a lot of people who think vitamins and

minerals, we just…we pee them out, that how can that possibly have an impact on mental illness? So we almost need to collect that…we first of all have to collect that very basic data, which is like, okay, does it work? Okay, if it works, then why does it work? So I totally appreciate where your question is and I said we are wanting to explore that but I also don't want to sort of neglect the really important thing, is, does it work in the first place, if that makes sense.

Danny Lennon: Hundred percent yeah, and I think like you hit on that important step of trying to get as much kind of concrete baseline evidence there so that…to push this thing more. And just when you mentioned some of the trials that you've been doing in your lab and you use this micronutrient supplementation, just from…it seems that it's obviously very different to what people might see as a standard run-of-the-mill generic multivitamin they buy in the local grocery store.

Julia Rucklidge: Mm-hmm. Correct.

Danny Lennon: So what actually is the supplement that you've mainly been using or what different types have you been using?

Julia Rucklidge: Right. So before I answer that question, it's so important that I first say that I have absolutely no commercial affiliations with any of the nutrient supplements that I've studied. So we've done all the work independently of the companies because I'm not here to advocate for one particular nutrient supplementation or one nutrient product. But as you allude to, there are great differences between different nutrient products, and so the ones that we've been studying—I mean, I'm certainly happy to say their names but again, it's just really important that you understand I'm not here to sell the products, we're studying them and they are a vehicle for us to study an idea, which is this idea that broad-spectrum micronutrients is a viable way to try to treat mental illness.

So I told you earlier that I'd heard about families who were treating themselves with nutrients. Now, they ended up…it's a very long story about how that happened but they ended up developing a product that's called EMPowerplus and since then, and that being over 20 years ago that that particular product was developed by these families—it's not developed by a sort of nutraceutical company; it's very unusual. Later on it's been…so the name has changed, and so there's daily essential nutrients is a variant of that or daily self-defense or EMPowerplus Advanced. So

there are various names that it now goes by and those products are all just a little bit different from each other but more the same than different.

How they compare to a product that you buy in the supermarket is there are three main differences. One of them is the breadth of the nutrients and that is you wouldn't typically see so many nutrients in a multivitamin mineral formula, so it's one of the differences. The second one is in the dose. The doses of the nutrients that are in these products are higher than recommended daily allowance but typically lower than the upper limit, and the upper limit is a very important number for people to understand, which is the number at which toxicity has been established. So you wouldn't want to take a nutrient over the upper limit because it's been identified that that might actually cause harm. So we don't want it causing harm to people.

Now, when I say they're not, some of the nutrients are above the upper limit but it's important to understand that upper limits are typically established with one nutrient. And so if you take folate by itself, you will create a B12 deficiency, and so you have to create an upper limit in order to prevent that type of deficiency from happening. But our bodies aren't designed to be taking nutrients as a single nutrient, but because of sort of the…I was talking about the drug model earlier, the drug model earlier suggests that we can solve mental illness with one molecule, and so often people think we can use that same logic and apply it to using natural substances as well. And that's where I think we've really gone wrong, and we actually spend decades looking at single ingredients like zinc or vitamin D or vitamin C, etc., and in most cases those studies are being pretty much a dead end or have produced very, very small effects, and that's probably because we need them all together.

Danny Lennon: Yeah, sure…

Julia Rucklidge: Yeah, we need to consume them together.

Danny Lennon: Mm-hmm.

Julia Rucklidge: So going back to the supermarket one, so there's the breadth; there's the dose, and so as I said a few of them are over the upper limit but that's because of if you consume them together you can actually take some of the nutrients at much higher doses; and then the third one is bioavailability, which is really important and something that a lot of the, again, the supermarket cheaper brands don't address, and that's how do you ensure that the nutrients are actually absorbed? And so in order for

minerals in particular to be well-absorbed through your gut, you need to have them well-chelated, which means that they get attached to another molecule that allows for the proper absorption of those nutrients. So oftentimes the nutrients that are in a sort of a cheap supermarket variety won't be well-chelated, so they won't be well-absorbed, and so therefore they won't have the same effect as the ones that are properly composed.

So those are the three main differences, and so I don't advocate for people to go and take what I've done and go and think that if they went and bought a multinutrient vitamin from the supermarket that it's going to have the same effect. At this point, the products that I've just named are the most studies products for the treatment of psychiatric disorders in the whole world.

Danny Lennon: And with that, the other thing I wanted to mentioned just while we're on this topic of nutrient density of the diet, also micronutrition including supplementation under that umbrella, there's obviously quite a lot at this point of observational studies showing that diets that are mainly unprocessed or full of whole foods, whatever you want to term it, are generally correlated with lower depression rates than…

Julia Rucklidge: Correct.

Danny Lennon: …what you mentioned, the Western diet or ones that are very high in highly refined foods. Outside of the observational data we have, what kind of breakdown do we have right now of quality trials or randomized trials showing the intervention with the micronutrient and then those effects, kind of just give a summary of what we've seen so far at this point.

Julia Rucklidge: Oh, okay. So there's not just the studies that I've done, there are studies in other places as well. In particular Australia, in Melbourne, there's been quite a few studies there that have looked at B-vitamin complexes alongside a few minerals where they've been able to show very clearly that, compared to placebo, B vitamins are really good at reduction of stress and anxiety, and that's been replicated all over the world. I think there's been studies there that have been done in the UK and have been done in South Africa that have all shown the same thing, which is that if you take these B-vitamin complexes alongside with a few minerals that that does have an impact on reduction of stress, and that's something that a lot of people are actually unfamiliar with that research but there are nine randomized control trials that have shown that. So that's a fairly robust finding.

There are some studies that don’t show anything. I just want to also sort of speak to that whole issue. And those studies, that’s negative trials that there's no benefit over placebo, but it's important for the listeners to understand is that though all those trials that have been negative trials, and often the ones that we hear about in the media are ones that have taken people who weren't particularly stressed to begin with or weren't anxious to begin with, or depressed because there's also studies that have been done on mood, and so they're taking sort of a normal population, giving them micronutrients and then determining whether or not their mood or anxiety got better. But if you're starting already at a really low point like in terms of not having a lot of the symptoms to begin with, there isn't much room for improvement. And so that's the challenge of this field, is that there have been those types of studies that are done. They declare that these nutrients don’t actually have any impact on these particular symptoms but they're studying the wrong population. If you really want to answer that question, you actually need to take people who are stressed or anxious or depressed to begin with. When you take stressed or anxious or depressed people to begin with, you then see the effects. That's when we see the really large changes.

So we've done studies on ADHD where we've shown compared to placebo that the nutrients are an effective way of reduction or improvement of attention, reduction of impulsivity and hyperactivity. We've done studies after the Canterbury earthquakes; we've looked at posttraumatic stress disorder symptoms. We've seen reductions in that, really quite remarkable reductions actually even following a very acute exposure to nutrients. We just think that the nutrients get completely used up in the fight/flight response that there's nothing left for the rest of the body to function, so we think we're just giving enough nutrients such that you can also dedicate some nutrition to handling stress and being able to cope with the ongoing stressors associated with those earthquakes. That was replicated following a flood in Alberta, Canada, so again, we showed reduction in stress in people who had been exposed to an acute natural disaster. There have been studies that have looked at the reduction of aggression in prison populations and there are now five randomized control trials that have concluded that these…giving a broad spectrum of micronutrients. Some of those studies were with or without omega-3 fatty acids, but ultimately just that sort of a very simple intervention reduced aggression, the number of violent acts in prisons and also in young offenders.

So there are some really promising studies that have been done in that area and I certainly think there's enough there that things should be changing. Those studies have been done in Europe, actually. Most of them have been done in the UK with…at Oxford with Bernard Gesch and they were published over 10 years ago, but I haven't seen that that's had a massive influence on how we treat prisoners.

There have been studies on autism. Those weren't done by me. Those were done in the US, again showing that there can be a reduction in sort of the difficult behaviors that are associated with autism by using broad-spectrum micronutrients supplementation.

So the evidence is quite varied across different disorders. It's sometimes for some people surprising that it would have such an impact on so many different things, but I think that's because again we're bred into believing that psychiatric disorders are categories and our research is challenging that, that are they really so different that they require these unique categories or is there an element of commonality across all of these different disorders such that when we correct what might be inborn areas of metabolism or whatever it is that is going on that we're providing the body with the nutrients that it needs to function optimally that people will, regardless of their symptoms that they're expressing, we will see a benefit or improvement across all those symptoms, and certainly we have seen that in our samples here in New Zealand, which is that when people get well and respond to the nutrients, they typically get well across the board. So they don’t just get well in the area that we were targeting like ADHD, we also see improved mood, improved anxiety. They seem a lot calmer. The parents will report they don’t have as many temper tantrums. They're not as irritable as they were when they first came into the study.

So there are these wonderful changes that occur across the board. I do want to emphasize though that we don’t treat everybody. Not everyone benefits from this approach. So just in case people think it was sort of this magic cure, it isn't. There's still a long way for us to go in understanding why is it that some people respond to these nutrients so dramatically whereas other people don’t respond at all.

Danny Lennon: Awesome, and I think you touched on something there that I think is really worth pulling back on because we have this now wealth of research from various different groups around the world that are all doing independent research that seems to be starting to accumulate, yet you mentioned then that it hasn’t really had that impact in terms of how we treat people kind of

on the frontline. So with this disconnect between the scientific literature base we have now and then actual…the way we're treating people, obviously there are some sort of obstacles in there that's maybe preventing that. And I think oftentimes when it comes to healthcare, unfortunately, when looking for changes in healthcare a lot of it maybe comes down to economics where these people have concerns about how economically viable certain changes may be.

Julia Rucklidge: Mm-hmm.

Danny Lennon: So if some of these treatments with micronutrients or bringing these different forms we've seen were to become more common practice, what does that do to healthcare spending or is there anything that's looked at what that would do to healthcare spending from an economic point of view?

Julia Rucklidge: Right. That's a great question and something that I'd like to certainly look at, is that issue of cost-effectiveness, and on the surface it depends on whether or not a drug is still on patent, about whether or not the micronutrients are cheaper or more expensive than a drug. Once a drug goes off patent, then if the drugs are dirt cheap—so I don't know what it costs in Europe but in New Zealand, for our drug agency pharmac to purchase a month's supply of Ritalin is $3. Now, you're not going to get any good-quality micronutrient supplementation for $3 a month, so if you think about it at that level of that cost difference, then you might say, "Wow, these micronutrients are really expensive," but you have to understand that you don't need a psychiatrist to prescribe it. These are things that can be safely taken with very…I mean, some supervision I think is important if you have a psychiatric disorder and you're coming in with ADHD, but you don't need the level of monitoring that is required with some of these psychiatric drugs. It's not got any street value whatsoever, which is certainly a serious problem in New Zealand with methylphenidate where it gets sold on the street. You don't have that issue of people wanting to sell undercover their micronutrients. So some of those other costs that are associated with the prescription don't exist.

And of course, another really wonderful difference is around the side effects. So again, many medications come alongside with some significant side effects that also need to be monitored. Like with Ritalin, for example, you need to monitor cardiac for some people, particularly adults. That's an important thing just because there are people whose blood pressure can be raised as a consequence of taking the medication. That doesn't need to

happen with the micronutrients. We're collecting safety data. We're looking at blood pressure. We're looking at whether or not there's any impact on liver functioning, kidney functioning. We're not coming up with anything. There's nothing there that's been of concern in all the studies that we've done to date. People are not reporting serious side effects. We are not having people drop out of our study because of side effects. Our retention in our studies is amazing, so our dropout rate is, in our current study, is 5%. That's two children having dropped out of I think we've got 56 kids enrolled at this point, which is really quite remarkable. If you look at drug studies, you'll see that there's a really high dropout rate and that's because people can't tolerate the tolerated the side effects that are associated with the drugs.

So if you want to look at it face value, then the drugs off patent will win in terms of what it looks like what it costs. If you look at them when they're on patent, then this is a much more viable way forward for our healthcare system to look at those. But that is one of the challenges, is there's no patent involved with a micronutrient supplementation. You can't patent a mineral or vitamin. So that is one of the big challenges.

Danny Lennon: Right.

Julia Rucklidge: There was a study that did look at cost-effectiveness though that came out of…it was just a case study but it really was quite telling, and it was a study of a 10-year-old boy who presented at the Alberta Children's Hospital with psychosis. And so he had hallucinations, delusions. He also had obsessive-compulsive disorder. Really ill, and he was apparently identified as one of the sickest children that they'd ever seen, like really disturbed, lots of psychiatric symptoms. He was treated with every drug under the sun for a six-month period and he was hospitalized for an entire time. The physicians were unable to do anything for this child and he was discharged at the same point as he was when he first came in. So that entire six months of treatment did nothing for him. The family that heard about the micronutrients, they chose to use them and over the next six-month period all of his symptoms completely vanished.

Danny Lennon: Wow.

Julia Rucklidge: The cost of the micronutrients in comparison to the cost of that inpatient stay and all of the testing that went alongside was less than 2%.

Danny Lennon: Wow.

Julia Rucklidge: So you can see there the huge cost savings. If the Alberta Children's Hospital had chosen to use micronutrients first, they would have saved a huge amount of money in all of that cost associated with an inpatient hospitalization. Of course, it's not going to help with everyone, but if we could kind of reverse it and say, "How about we try micronutrients first particularly with developing brains?" I can't emphasize that enough, just the importance of giving nutrients to children as opposed to a pharmaceutical where the long-term outcomes of the pharmaceuticals is really quite sobering and more should be aware before they put their children on these drugs of what the long-term outcomes are going to be. But you try nutrients first. If that doesn't work, the medications still have a role, they have a place, but how about we try them second?

Danny Lennon: This whole I think on an individual like per-patient basis, like I don't even think that the cost is much of an issue because I don't know pretty much anyone that has some sort of mental health issue or some sort of psychiatric disorder that wouldn't prefer to be taking like just some micronutrient supplementation as opposed to any type of drugs regardless of if there's a difference in price, right?

Julia Rucklidge: Correct. They would as long as it's well-supported. I mean, the challenges that we face is that we will make people well in our studies, they'll get well, all of their symptoms will be gone, and then what will happen is they'll go visit their family doctor and they might say…the family doctor will say, "What are you doing taking those micronutrients? That's not going to work. You have a serious medical condition. You need to be on a medication." And so we've heard that from families many, many times and that's one of the big obstacles, which is that until you have the buy-in of your society, of your community, of the physician, then we're always working uphill. And so in those types of situations that these families go back or these individuals go back on medications, they are not as well, they often continue to have symptoms and side effects, and then I'll say, "Well, what about the micronutrients?" "Oh. Oh, right. Oh yeah, I did do really well on that." "Well, how about you try those?" So they forget about it. It's been dismissed. So we do face a lot of those types of challenges in trying to keep people on these nutrients once we've made them well because people around them are not supporting this idea. They just think that there's no way you can use nutrients to treat serious mental illnesses, and I would like those people to read the literature before they express their opinion.

Danny Lennon: Yeah, and I think like, too, if you think on a…with any doctor, I'm sure they would love to be able to treat people with using micronutrients over drugs first, certainly the doctors that I know, but perhaps it's from if you will again go back to the kind of economics thing and I don't want to sound like a conspiracy theorist I think because I'm the farthest person from someone who says big pharma is out to kill anyone, like I hate all that stuff…

Julia Rucklidge: Yeah.

Danny Lennon: …but at the same time we do have to acknowledge that pharmaceutical companies do have a different agenda and they do have something, like you mentioned, that they're providing these drugs and they're not always going to be super-honest with everyone, and you even look at that in terms of the research that gets published on different drugs, right?

Julia Rucklidge: Right.

Danny Lennon: So there's all that to contend with, so again, it's just another obstacle like I think we mentioned.

Julia Rucklidge: Yeah.

Danny Lennon: But before we do finish, because I know we're coming up on time, I did want to get on to a kind of final thing that may be kind of practical for people listening because there's likely a significant number of people that are listening right now who are either living with some form of issue themselves or have a family member who has one of the disorders we've mentioned so far and they may be thinking is there any practical advice that they immediately take action on because, again, first, a big disclaimer that this show is not in the business of offering medical advice. I'm not expecting you to offer medical advice. We're certainly not saying that.

Julia Rucklidge: Yeah.

Danny Lennon: But for what people can start doing now to even inform or taking action, what can they maybe start thinking about in terms of diet, supplementation, blood testing, anything like that?

Julia Rucklidge: Sure. Right, okay. So I guess the first thing is that if people out there are medicated, don't stop your medication at this point based on hearing about this, and that's really important and there are a number of reasons why I'd say that. One of them is that some of these drugs we're not…is again not well-known, or in some circles, but they can cause a lot of withdrawal if

you were to just stop it very quickly, so that needs to be done under really careful supervision. The micronutrients that we're studying do…if you take them alongside medications, the medications do need to be tapered carefully and under proper supervision from your physician, and so it's not necessarily a thing of just adding in micronutrients. It's a very different approach as I explained earlier and, therefore, taking them in combination does need to be done really quite carefully and, again, with a physician who actually knows what they're doing in terms of the use of nutrients.

If you're not on medications, then it's certainly worth giving the nutrients a go. I'm always happy to receive emails from people to learn more about how they can purchase the nutrients etc, etc. So I'm used to that and I sort of have a blanket email that I'll send to anyone who emails me about it. I certainly want to make sure that this is done properly. And if somebody does give it a go, really the number one thing I can't emphasize enough is that you do it consistently. The people who do not respond as well are the ones who don't take them regularly the way they're supposed to be taking them.

In terms of blood tests, at this point I'm not convinced that—and I know certainly some people really advocate for blood tests to determine whether or not you have any deficiency in any single nutrient or single…so looking at vitamin D, etc. While they can be informative, it doesn't actually tell us who's going to respond to the nutrients and we have looked at this in our research. So it's not necessary to do a blood test before embarking on using the nutrients because what might be…an individual may come out with a "normal" level in all of their nutrients and that would actually in itself be very expensive to do, but that doesn't necessarily indicate what you as an individual need. And so we're all biochemically different, and so what I need is going to be different from what the next person is going to require in terms of those different nutrients.

And so getting your nutrients done is not necessarily going to tell you what your brain needs. Like, so for example, calcium levels are there to determine what your bones need not what your brain needs, and so they're not necessarily going to be that helpful. Again, that might change in the next 10 years or so where we can become more sophisticated in determining what is going to be the right levels for brain metabolism and for the brain operating effectively, but at this point I'm not convinced that that's necessary. It might be to determine whether or not you've got some serious condition that means you wouldn't take these nutrients, which will be something like Wilson's disease, which is where you have an inability

to metabolize copper. Copper is often in these complex micronutrient formulas, and so that'd be sort of a reason for you not to take those. Most people know if they've got Wilson's disease though.

So, in terms of diet, that's easy. I mean, I would just start with reduction of the amount of processed foods that you eat and increasing your fruit and vegetable intake and just heading towards eating fresher and fresher foods, more whole foods, rather than the takeaways and sort of the packaged foods. So just that sort of…a gentle sort of shift in that direction can do wonders. And at this point we don't know if that's all you would need to do, is start eating more healthily, eating sort of… The best data is for the Mediterranean-style diet, and so eating more of that type of healthy fats, nuts, fish, those types of shifts in your diet would be generally a good thing.

Again, I can't give sort of a blanket advice because we're all different and we all…there's an expression, something about one man's meat is another man's poison, so there are things that some people won't…can't tolerate and they can be things that you'd think we should all be able to eat, like tomatoes, but some people of course have reactions to tomatoes or other foods that we typically identify as being healthy. So there are those challenges around the unique attributes that we bring to it around allergies, etc., but at least those are sort of some general pieces of advice for your listeners.

Danny Lennon: Awesome. Yeah, excellent. Thanks so much for that. And like I said, just before I get to the very final question, maybe you could just let people know if they want to look into more of your work, where can they find you online or more information about the work you're doing if they want to look that up?

Julia Rucklidge: Sure, and you can find all of my research on ResearchGate. ResearchGate is free to join, and so just Julia Rucklidge. Or, you can Google my name and you'll end up hopefully at my University of Canterbury website. It's fortunate to have an unusual name because as far as I know I'm the only one out there with it, so it's quite easy to find me. I've got a TEDx talk, which is…so that's 17 minutes hopefully of useful time spent just listening to more about what we've been doing and the background to it. So those would be really good places to start, I think, if you wanted to know more about our work.

Danny Lennon: Awesome. And for everyone listening, I will link up to all of that stuff in the show notes, this episode, **so you can** click through and find all of that.

So Professor Rucklidge, it brings us to the very final question that we always end the show on, and again, it's quite a big, broad open question so apologies for springing on you, but it's simply, if you were to advise people to do one thing each day that would have a positive impact on some aspect of their life, what would that one thing be?

Julia Rucklidge: That's good. Yes, that is quite an open question. What would it be? I would say I think that we're creatures of habit and I think being consistent and regular in sort of our biological rhythms is really important that as soon as we start to sort of just delve off and not necessarily eat properly or not sleep properly, it's not long before that catches up to you in terms of no longer being able to cope or deal with stress. So I think that would be one of the things that I think is really essential that we…being kind to your circadian rhythm and it would go probably a long way in terms of just, you know, able to cope overall with what life throws at us.

Danny Lennon: Awesome. And yeah, for everyone that listens regularly, they'll know how much we've hammered on circadian rhythms before, so really glad you brought up that point. Professor Rucklidge, this has been an honor to be able to have you on to talk through some of your work and give people an insight into what you're doing.

Julia Rucklidge: My pleasure.

Danny Lennon: I think it's really important work and hopefully that can be the thing that's going to make some big breakthroughs. So, thank you for taking the time out to discuss it. I really appreciate it.

Julia Rucklidge: No problem. Always my pleasure.