Top Takeaways: #286 How The RCCX Gene Is The Missing Link to Many Complex Illnesses with Michael McEvoy with Michael McEvoy

1. RCCX is the most complex region of the human genome composed of 4 unique genes that do very unique things.
2. RCCX I can produce a phenotype that has an array of different kinds of diseases and symptoms the most common being autoimmune diseases.
3. This is especially true of lupus, type 1 diabetes, Ankylosing spondylitis, rheumatoid arthritis, multiple sclerosis, crohn's disease, celiac disease, and several others.
4. Sometimes patients with these autoimmune diseases will have other overlapping diseases or symptoms, which are directly related to their autoimmune disease. This is called comorbidities.
5. Some of these diseases include joint hyper mobility syndrome, and psychiatric illnesses like schizophrenia and bipolar disorder.
6. The gene that makes cortisol is not just localized to the adrenal gland, which suggests that cortisol has a really significant role in the glands of our nervous system.
7. The 4 genes that make up RCCX region behave like one gene, which causes the overlapping conditions.
8. The first gene TNXB, tenascin-X, is one of the most abundant sugar protein found in our extra cellular matrix, which holds together all of the cells in the body.
9. The extra cellular matrix does many important things for regulating how our body works such as interacting with the nervous system, the immune system, and the endocrine system.
10. When you have mutations in this gene you can have hyper mobility, and skin elasticity.
11. The second gene is called CYP21A2. This gene takes your hormone progesterone, and converts it into your adrenal hormones Cortisol, and aldosterone.
12. Cortisol irregularities can effect your adrenal thyroid hormone causing thyroid issues, while irregularities with aldosterone, which effects our ability to regulate sodium, can lead to chronic dehydration.
13. The third gene is called Compliment C4 plays an important role in innate immune system, as well as producing the protein that makes C4A and C4B, which when deficient can cause many autoimmune disorders.

14. Even more importantly, this gene regulates pruning of our brain synapses, so if there are irregularities, disorders like schizophrenia, bipolar disorder, autism, even Alzheimer's and Parkinson's disease can occur due to this aberrant synaptic pruning.
15. The C4 gene actually contains endogenous retroviruses known as HERV-K. There has been papers recently published that showed the association between the different genomic variations of the C4 gene and schizophrenia.
16. The first thing Michael does when evaluating someone who might have RCCX mutations is look for the toxins that may be effecting the individual as well as, looking at heavy metals, like aluminum and mercury which directly effect connective tissues.
17. In detoxification, our connective tissue needs to be a major focus because the tissue is negatively charged and will attract positively charged toxic metals.
18. Because those with RCCX mutations have more trouble regulating these functions they need to be proactive at detoxing this toxic metals being stored in their connective tissue.
19. You can learn more about Michael McEvoy and his work at metabolichealing.com

Wendy Myers: Hello everyone, thanks for tuning in. My name is Wendy Myers. Welcome to the Myers Detox Podcast, where we explore all the topics related to heavy metal and chemical detoxification, retoxing, and detox protocols and supplements.

Wendy Myers: Today, we're talking with my friend, Michael McEvoy about a genetic issue called RCCX that impairs people's ability to detox amongst causing all kinds of other different health issues. Immune system related disorders, autoimmune disease, hypermobility in the joint's connective tissue issues, and so many other symptoms that make people sick, that doctors may be failing to recognize and missing treatment opportunities.

Wendy Myers: Michael McEvoy, he is in the forefront of research and discovery when it comes to functional medicine and he's going to be talking to us about this RCCX gene and sequence of genes that interact with each other, and the people suffering from multiple health issues, especially autoimmune illness, need to pay attention.

Wendy Myers: Today, we're going to be talking about how joint hypermobility is a sign of underlying health issues with this RCCX mutation, how that connects to other different types of symptoms. People that can have cortisol issues, anxiety, sleep issues, mental health issues, like schizophrenia and bipolar, and how people also can be suffering from addiction and other health issues. We're also going to talk about how RCCX people are so sick due to their impaired ability to detox, and the kind of testing to find out if you have RCCX and what you can do about it.

Wendy Myers: For any of you guys interested in heavy metal detoxification and finding out what types of metals that you have, if you need to detox, I created a simple quiz that can give us clues as to the heavy metal levels in your body. Please go to heavymetalsquiz.com and take the two-minute quiz, and your results maybe surprising to you. You can also find some

solutions to heavy metal detox after you take the quiz. So go to heavymetalsquiz.com.

Wendy Myers: Our guest today, Michael McEvoy, he is the founder of Metabolic Healing and co-founder of True Report, which is a testing software, functional medical testing software. Michael is recognized as a thought leader, systems creator, educator, and integrator of diverse clinical modalities. Michael has created the Metabolic Healing Institute out of the need for deeper clinical applications and clarity of vision in the field of functional medicine and integrative healthcare.

Wendy Myers: Through unique educational and teaching endeavors, Michael's objective is to assemble a network of the world's top clinicians to meet the demands and challenges of 21st century functional medicine, and to implemented that analytical tools and frameworks required. You can learn more about Michael and work with him or one of his team members at metabolichealing.com. Michael, thanks so much for coming on the show.

Michael McEvoy: Thank you for having me Wendy. It's great to be here.

Wendy Myers: So you've been doing a lot of interesting research into RCCX. Let's talk about what that is exactly and why is it significant.

Michael McEvoy: RCCX has been described as the most complex region of the human genome. There are studies going back 25 years or so, talking about this is really, really, really a significant complex of four really unique genes that do really important things. I've got initially involved in this research couple years ago when somebody had sent me their genome and I started doing research on their joint hypermobility. That led me down a whole rabbit hole of uncovering research about the connective tissue and what's called the extracellular matrix, and then that eventually led me to find out about this RCCX gene cluster and its involvement with not only hypermobility, but also a very wide spectrum of health conditions that will really explain, it does explain many people suffering with complex disease.

Wendy Myers: What are some of the primary diseases associated with RCCX?

Michael McEvoy: As you start to look at the evidence and the scientific literature as well as the clinical picture, you start to realize that this pattern of this RCCX phenotype, it runs in families. I'll start out by just saying that one of the best ways of finding out who has this going on is by not only looking at the symptoms and diseases of an individual, but also just as importantly the family members.

Michael McEvoy: RCCX can produce a phenotype that has an array of different kinds of diseases and symptoms. The most common are autoimmune diseases and there is about 12 or so autoimmune diseases that can run with on the RCCX phenotype. That's especially true of lupus, of type 1 diabetes, of ankylosing spondylitis, of rheumatoid arthritis, of multiple sclerosis, and a

handful of others. Crohn's Disease, celiac disease can run on the RCCX spectrum. But what's also interesting about that is that as you start to look at this, sometimes the patients with these autoimmune diseases have other diseases or other symptoms, which are called ... Were often referred to as comorbidities, where you have two or more existing overlapping diseases. These diseases are directly related to the the autoimmune disease that they have. The other thing you'll see is that family members will often present with other types of diseases that are related as well.

Michael McEvoy: Some of these other diseases that you'll see that run in families or even in the patients themselves include joint hypermobility syndrome, such as Ehlers–Danlos syndrome. The hypermobile type for example can have joint hypermobility that can be anywhere. It can be in the hands, the elbow, the shoulders, the jaw, TMJ, the hips. And this can run in families or in the individual patient themselves with the autoimmune disease.

Michael McEvoy: The other diseases that run with RCCX are psychiatric presentation or psychiatric illnesses, and that's especially true of schizophrenia and bipolar disorder. There's often a lot of associations with other people in the family that are on the autism spectrum. And so as we start to see the the phenotype, those are the main kind of diseases, but then there's this whole sweeping cascade of different symptoms that can run with that, such as PCOS and ovarian cysts, endometriosis, congenital adrenal hyperplasia, and a whole wide range of other conditions and symptoms.

Wendy Myers: Let's talk about the congenital adrenal hyperplasia. Is that related to excess cortisol secretion and then accompanying anxiety and sleep issues, and maybe even addiction that's caused by increased secretion of cortisol?

Michael McEvoy: Congenital adrenal hyperplasia is considered to be a rare condition. However, I believe it's actually grossly under-diagnosed. I think that there is milder versions of congenital adrenal hyperplasia that are plaguing a vastly underreported percentage of the population. The predominant phenotype that has congenital adrenal hyperplasia tends to have low cortisol. It's because of a gene mutation within a gene that's located in the RCCX region known as CYP21A2. This is the gene that actually makes cortisol and it also makes aldosterone, which is another adrenal hormone, and it makes these hormones from your progesterone.

Michael McEvoy: So people that have congenital adrenal hyperplasia, the vast majority of these people, they tend to have very low cortisol and what winds up happening is because they can't make cortisol sufficiently, the progesterone bottlenecks and it goes and it makes your androgen hormones, like your testosterone and your androsterone and androstenedione. And so consequently, one of the consequences of congenital adrenal hyperplasia is PCOS and ovarian cysts. And that's because of the high androgen profile. Now, there's a smaller subset of

patients with congenital adrenal hyperplasia, who actually have high cortisol. So there can actually be different CAH phenotypes.

Wendy Myers: And so someone that's producing too much cortisol consistently, I mean what are some of the symptoms that they're going to have?

Michael McEvoy: Well, if cortisol is not being processed or made in a correct way, it could be high or low, anxiety is one of the most pressing and obvious symptoms of that. Mood disorders would be another obvious presentation.

Michael McEvoy: One of the things I want to point out is that is really, really interesting stuff, is that the gene that actually makes cortisol is not just localized to the adrenal glands. It's actually also found in the brain and in the nervous system. And so that suggests that there is a direct relationship between the brain, the limbic system, which is a part of the brain that processes emotions and memories, and other regions of brain like the hippocampus and hypothalamus and the the spinal cord itself contains CYP21A2 RNA. And so it suggest really strongly that cortisol has a very significant role in these glands and our nervous system.

Wendy Myers: Yeah, very, very interesting. So talk about some of the functions of the RCCX gene. What do they do exactly?

Michael McEvoy: What you need to know is that the four genes that make up the RCCX region, they are very unique because they tend to behave like one gene rather than four separate genes. Usually when you have a problem in one gene, it's affecting all of the other three genes. And that's why there's a lot of the overlapping conditions and diseases and symptoms that run in individual as well as in families.

Michael McEvoy: The other thing that's really, really unusual and anomalous about these four genes is that they can overlap with one another. Meaning that the genes which are normally separate actually share different regions of each other. So they can cross-react that way and this can affect their transcription and translation, which are DNA processes to make proteins and enzymes.

Michael McEvoy: But the actually genes that make the RCCX gene a really, really powerful and important for a lot of different physiological processes in the body. The first gene is known as TNXB, and this is called tenascin-X. And TNXB is one of the most abundant, what's called glycoproteins, so it's a sugar protein that's found in the extracellular matrix. And the extracellular matrix is basically the connective tissue and polysaccharides and collagen and proteoglycans that hold together all of the cells and all of the organs and all the tissues. And your extracellular matrix is found all over the body. It's ubiquitously found in every region of the body. It turns out that the extracellular matrix does many, many important things for regulating how our body works. And that includes, it interacts with the nervous system, with the immune system, with the endocrine system. And it regulates how we process stem cells, it regulates how we process

certain cytokines and different growth factors. So it's really important for the whole physiology.

Michael McEvoy: And when you have mutations in the tenascin-X TNXB gene, you have hypermobility. You can also have skin hyperelasticity, where it feels like the skin ... You can actually see a person's skin looks like it's actually kind of coming off of them, that's not being held together. So these are associated with a tenascin-X mutation and deficiencies and problems in that RCCX gene. That's why there's this really strong hypermobility link to all of these other conditions and comorbidity. We see that run with the RCCX phenotype.

Michael McEvoy: The second gene, Wendy, on the RCCX cluster is known as CYP21A2, and this is the gene that, as I've mentioned, it takes your hormone progesterone, 17-hydroxyprogesterone, and it converts it into your adrenal hormones. Cortisol and your other adrenal hormone, aldosterone. So cortisol, as many people know, is the most important stress hormone of the body, and it also has a lot of really important roles in modulating the immune system. Cortisol interacts with a lot of other really important hormones like our thyroid hormone, for example. So people that have thyroid issues often have adrenal hormone issues and vice versa.

Michael McEvoy: Aldosterone is another adrenal hormone that gets made by the CYP21A2 gene in the RCCX cluster. Aldosterone is one hormone that doesn't get a lot of attention in press, but it's one that's really, really, really important. One of the main functions of aldosterone is to regulate our body's sodium. And sodium plays a really important role in our electrolyte system, in keeping our cells hydrated and properly, electrically charged. And so if we don't make enough aldosterone, we don't retain our sodium. We're chronically dehydrated. And as you know Wendy, many of the clients and patients that have chronic illness are chronically dehydrated. Their tissues don't hold water and salt and as a result, their body doesn't work right. Their cells don't work right. That's the second gene on the RCCX region, it's the CYP21A2 gene.

Michael McEvoy: As I mentioned, the other really interesting thing about that is that, that gene is also found ... The RNA of that gene is found in the brain and in the central nervous system, which suggests a direct role of cortisol in the brain and nervous system.

Michael McEvoy: The third gene on the cluster is one of the most interesting genes, and it's known as complement C4. Complement C4 is a really, really important and as we're starting to learn from the scientific research, complement C4 does a lot of really important things. The first thing that complement C4 does is it is a part of what's called the innate immune system. The innate immune system is actually the oldest part of our immune system. The innate immune system is the first line of defense that will look for different pathogens and that are circulating throughout the body, and it will basically grab on to these pathogens and create these what are called

complement protein complexes. And so the complement C4 is one integral part of the complement immune system.

Michael McEvoy: So we know that the complement C4 gene plays a really important role in chronic disease. A lot of the really smart integrative medicine and functional medicine doctors today, they run testing on a protein known as complement C4A, and they do this a lot in the the mold, what's know as mold and CIRS, as well as in patients that they suspect that have Lyme disease because the C4A levels tend to be elevated in those patients. So complement C4 is actually the gene, the protein that makes the C4A and the C4B and then the pathway kind of splits off and then it work with the antibody system to neutralize different kinds of bacterial and viral pathogens.

Michael McEvoy: People that have variations of the C4 gene or deficiencies of the C4 protein caused by the mutations of the RCCX C4 gene, they tend to have these different autoimmune diseases. For example, lupus, systemic lupus erythematosus is probably the disease that's most associated with complement C4 deficiency. In the scientific literature, 75% of patients with lupus have shown to be C4 deficient. And there's a lot of other autoimmune diseases associated with complement C4, ankylosing spondylitis, rheumatoid arthritis, Crohn's disease, celiac disease. So there's a ton of different diseases that can be caused by the immune system's inability to work right because of not enough complement C4.

Michael McEvoy: But the other really interesting and important thing that has been discovered not too long ago is that the complement C4 protein is actually one of the most important proteins that regulates what's called the pruning of our brain synapses. A good analogy of what the pruning of brain synapses is, is you have like a fruit tree and or any kind of a tree that for that matter. In order for that fruit tree to bear fruit, it has to be pruned, it has to be trimmed on a regular basis, and if doesn't get pruned, you can have problems in how the fruit gets made. It might not even be made at all. The same thing is really true in our brain and our nervous system. A lot of the diseases that are associated with aberrant synaptic pruning include schizophrenia, bipolar disorder, autism, even Alzheimer's and Parkinson's disease involve aberrant synaptic pruning. And sure enough, as you start to do the research of the scientific literature on complement C4, you find that it's actually one of the most significant proteins that is involved in these different diseases.

Michael McEvoy: There were actually two different studies that looked at on variations of the complement C4-B gene and were studying autism spectrum, and they found in these two different studies almost the identical thing, was that about 40% of autistic patients had no alleles of the complement C4B gene. That's a huge whopping statistical association. And we know that from other autism research that autism features aberrant synaptic pruning in the brain. Too many brain synapses that aren't being appropriately, and the RCCX cluster is one of the central genes, central regions of the genome that influences this process of synaptic pruning. But Wendy, it

even gets more and more interesting because a couple of different things that are going on here that are really, really crazy is that one of the regions of that C4 gene actually controls how you make cortisol, how your adrenal glands make cortisol.

Michael McEvoy: In other words, there's a direct relationship between our adrenal hormone activity and our immune system's ability to regulate the complement pathways and how that's clearing pathogens and toxins intruding the synapses in the brain. All of these things are directly tied together. The other really fascinating thing, Wendy, that a lot of listeners might even know about is this whole relationship to what are called endogenous retrovirus.

Wendy Myers: Yes.

Michael McEvoy: You've probably heard a lot about the work of Dr. Judy Mikovits and Dr. Dietrich Klinghardt and others that are now really becoming very vocal about these retroviruses that are potentially associated with a huge spectrum of different diseases.

Wendy Myers: Yeah. We've had Dr. Judy Mikovits on the show, talking about how all vaccines contain retroviruses that then wreck havoc on our immune systems and our health, and why a lot of people are suffering from mystery illness. It maybe these retroviruses that are impacting them that are going undetected by conventional medical doctors.

Michael McEvoy: Yeah. That's a really, really interesting and important arm of research that's only beginning to really get attention. The work of Dr. Klinghardt and Dr. Mikovits is a really, really significant and really important for understanding some of the core mechanisms of complex disease.

Michael McEvoy: There's two different kinds of retroviruses. First of all, a retrovirus is not the same thing as a DNA virus. DNA viruses are very common and we all have them. We've all been exposed to things like Epstein–Barr virus and many of us may have been exposed to other herpes simplex viruses like, genital herpes HSV-2 or HSV-1 oral herpes or cytomegalovirus. Those are all what are called DNA viruses. But there's a second class of viruses know as retroviruses, and retroviruses are known as RNA viruses. They're slightly different because they reverse transcribe versus positively transcribe, which is a process I won't go into, but they're different. So there's actually two different kinds of retroviruses.

Michael McEvoy: The first kind of retrovirus is what we call exogenous. Meaning it comes from outside of our body. The most common exogenous retrovirus is HIV. And some of the other ones that Dr. Mikovits has pointed out in her lab research are the XMRV retrovirus and the HTLV-1 exogenous. These are exogenous retroviruses which may very well be contaminated in vaccines that are being injected into people.

Michael McEvoy: The second type of a retrovirus is known as endogenous retrovirus. Meaning that it's already inside of our DNA. So a really fascinating thing, as you start to research this, is that part of human evolution, a really important part of human evolution involves having been infected in early parts of our evolution by these different retroviruses, and they're in our genome. There's maybe 10% to 13% of our own genome, our own DNA contain these endogenous retroviruses, and most of them are silent, they don't express. However, there's been a lot of different scientific research that shows that the expression of these retroviruses in our genome can actually come out of hiding and actually show up in the blood. And this is happening in autism, in psychiatric illness. It's been shown to happen in in autoimmune disease and especially in cancer. And so there's kind of this pursuit of trying to understand what are these endogenous retroviruses doing.

Michael McEvoy: Well, what's really interesting is that the complement C4 gene located within the RCCX cluster, the C4 gene actually contains in it one of these endogenous retroviruses known as HERV-K. And there's been some papers recently published that showed the association between the different genomic variations of the C4 gene and schizophrenia.

Michael McEvoy: Dr. Klinghardt recently presented some information at a conference that I attended that suggested that in schizophrenic patients there maybe fluctuations between these retroviruses expressing during episodes of psychosis, versus when you're feeling more normal or less psychotic, these retroviruses don't express as much. We know that the C4 gene is directly linked to that HERV-K retrovirus, so it very well may be the case that both of these things are directly related to how the brain is functioning.

Wendy Myers: Yeah. And so can we talk about any kind of tests? You may have piqued people's interest on, "Is this me? Do I have RCCX?" What kind of tests are available to test the RCCX related genes or their loss of functions?

Michael McEvoy: So because the RCCX gene cluster is the most complex part of our DNA, this is not something that's actually really available to be clinically tested yet. There are are a couple labs in the world that can do probing of the RCCX gene cluster to identify what's called the copy number of the region, but these labs are really specialized and they don't really function for clinical purposes, it's more for research. Even in 23andMe, they don't have the SNP or the SNPs for the major RCCX genes because it's so complicated to sequence it.

Michael McEvoy: Unfortunately, we don't have that technology available for clinical use yet. However, I'm looking for research funding to try to develop and to move this area of research forward. There's some things that are happening, some wheels are starting to turn so that we can start really getting bigger population data on genomic research for RCCX.

Michael McEvoy: What we're using now from a clinical standpoint and being a clinician myself, what I'm looking to do is to try to find the people that have the most likely association. We already know based on the science who is likely the most obvious candidates for the RCCX genotyping and even clinical work. What we can do is we can look at the big overall trait of different symptoms, diseases that run in the family, as well as in the individual patient to get the overall picture of who has this.

Michael McEvoy: The other thing that we can start doing and what my team has already started to do is to actually look at some basic laboratory markers that could help us to understand this. For example, we can look at the complement protein C4 levels. We can actually look at that and see if it runs low. We can look at the 24-hour urinary cortisol and to see if that runs low. We can run some other specialty tests, like some immune T cell markers, the CD4, CD25, T regulatory cells flow cytometry, and we can run those in combination with the TGF-beta-1 and the complement C4. We can run an assortment of different really specialized tests to get a picture of what's going on with an individual. That's what we're doing in our clinical work right now at the moment.

Wendy Myers: What are some of the primary therapies that you're using with this client population that you identify as potentially having the RCCX mutations or cluster of mutations, and are any of them effective if someone things they have this genotype?

Michael McEvoy: Yeah. That's a great question. As a clinician, who works with a lot of clients that have complex illness, I'm always looking to figure out what can I do to help them to optimize their health. What's the best and important types of therapies.

Michael McEvoy: First of all, what you need to know, and you know this too Wendy, is that you have to work on an individual level in finding out ... Meeting a person exactly where they are in their own health journey. The first thing that we need to appreciate is that the people that have this going on are some of the sickest people in the population. I've had people come up to me and say, they start crying, they say, "You just figured out my entire family for the suffering that we've had for years and years and years." These people really exist, and they exist in a really significant way, and they're really sick.

Michael McEvoy: The RCCX phenotypes are very, very susceptible to environmental toxins. The first thing that I do when I'm looking at this phenotype is finding out which toxins are the biggest culprits that are affecting them because their immune system and the endocrine system and their cortisol doesn't work the same as it does for other people. Their connective tissue and their extracellular matrix doesn't work for other people. They don't have the ability to detoxify and to protect themselves from the onslaught of environmental factors and toxins. So I'm always looking to evaluate what infections, what toxins are present. We often find mold is a huge factor. These people are often very susceptible to chronic inflammatory

response from mold and mycotoxins, which is now really a common thing that's being uncovered in the functional medicine world. They are often also suffering from chronic viral infections as well as Lyme disease, and Lyme disease co-infections.

Michael McEvoy: One of the things that I found in my presentation to The Forum for Integrative Medicine that I gave recently was that there's a number of different kinds of Lyme disease infections and co-infections that can cause a person to have joint hypermobility. Bartonella and Borrelia, which is Lyme, these can cause hypermobility. And so if somebody already hypermobile because of this RCCX cluster, it can even cause more havoc on their connective tissue.

Michael McEvoy: The first thing that I do is always look for what are the toxins. So we can look at heavy metals, like aluminum and mercury because the connective tissue is going to be directly affected by these heavy metals. Once we identify that, we start to piece together what needs to happen first. We start to say, "Okay, well if there's ... If these viruses or infections are present, we need to include that as part of the therapy in some way."

Michael McEvoy: The second thing we start to look at is exactly what are the individual ... How is RCCX expressing in this person directly. Because not everybody with this has autoimmune disease, although that's probably the most common thing. Some people in the family might have it, but the individual client or patient might have a psychiatric illness, for example, but not necessarily lupus, but the sister might have lupus, for example. So it tends to run like that.

Michael McEvoy: So if somebody has an autoimmune component, the first thing that I start looking at is let's look at the complement C4 protein level, and we can do some other specialized tests. Like there's a test known as the CH50 and this helps to evaluate the other parts of the complement immune system that might be deficient. So we then start to work on the gastrointestinal tract because the C4 protein will affect immune tolerance. If you don't have enough complement C4, you don't have enough T regulatory cells, and the T regulatory cells prevents autoimmunity from happening. And so we can actually support the T regulatory system by using some really high-quality kinds of probiotics, like the bacillus subtilis, you can use serum bovine immunoglobulin, we can use short-chain fatty acids. We've got to modulate the gastrointestinal tract. And so we start there.

Michael McEvoy: We also you really pay a lot of attention to the electrolyte balance because electrolytes play a really important role in this whole picture. So to kind of take it back to the whole connective tissue component, remember that in order for our body work correctly, our cells, our tissues, our connected tissues. In order for that to work right, we've got to have electrical charge. Wendy, I can't emphasize enough how important this is and how overlooked this is. The dehydration of our cells and tissues is a primary cause of illness and pain and loss of integrity in our body. And so we can use some specific test to evaluate the electrolyte activity.

Michael McEvoy: We started running recently a test called a urinary aldosterone. We can actually measure aldosterone in urine to see if people are deficient. And what we find is that once we start modulating aldosterone, this can be transformative for people. Everything clears up. Their skin, their immune system starts to improve, their body is more hydrated because it can retain salt and electrolytes better. We have to really pay attention to that hydration component because it really can set up problems if it's not happening.

Wendy Myers: Yeah. In that same conversation, mercury toxicity can inhibit the production of antidiuretic hormone or cause it to produce more and then people have increase urinary output, which can be really aggravating and irritating. And they drink water and are trying to hydrate, but they're just urinating it all out. The mercury is causing that problem, and they also either don't consume enough minerals, or vegetable juices, or they drink the wrong water that's not structured properly. There are so many different things that could be working against hydration.

Michael McEvoy: Absolutely. Aluminum is another one of those heavy metals. Aluminum is a trivalent cationic metal that can cause the blood cells to become clump together. Just like a Wi-Fi radiation can do the same kind of thing to our tissue and cell hydration. So there's a lot of things going on that can negatively affect how our cells are hydrated, and so we really focus on that. When we really hit that, sometimes that can be the most important thing with some people. So we pay attention to modulating the immune system, that gut, the hydration, and we can also really modulate the stress response.

Michael McEvoy: We often find, especially with more of the psychiatric presentation of the RCCX phenotype, we find that these people tend to really be very emotionally sensitive and highly empathic. Very sensitive to other people's energy around them and they're very susceptible to PTSD and to anxiety disorders. A lot of it comes down to how the brain is programmed to work from a really, really young age. We know that the amygdala and the hippocampus, which are regions in the brain that process emotions and memories, these parts of the brain have cortisol receptors. So they're going to be really sensitive to the stress response. And so if there's been trauma in a person's life and if there's been emotional issues that are going on, these have to be addressed on some level. Just from a therapeutic level, we can use therapies like EMDR and DNRS and emotional processing therapies to help to kind of get some of this emotional trauma out of the system.

Michael McEvoy: We can also use things like CBD and cannabis and cannabidiol and inhibitory balancing GABA and glutamate to kind of calm the nervous system and to kind of bring the endocrine system in the brain back into a state of calm and parasympathetic balance.

Wendy Myers: Yeah. And so for anyone listening that is suffering mystery illness or chronic illness and no conventional or even many functional medical

doctors are not able to get at the root cause of it, are you working with people presently? Are you taking on new clients to work with, people trying to figure out what's going on with them?

Michael McEvoy: Yeah. Absolutely, we are. And we're looking to have people to think that they might have this RCCX phenotype to contact us directly to our site, because we'd like to work with you and possibly study you and to help you because we're still learning about this. This is an incredibly complex and really, really important part of our genome that does not behave like the rest of our genetics. We know that these people exist, we know what they look like, we know the kinds of diseases and illnesses they suffer with, and we also are starting to see the kinds of therapies that we need to start to implement in order to support their body.

Wendy Myers: Fantastic. Well, Micheal, I have been on the edge of my seat the whole podcast. And I'm sure the listeners have as well. It's always a joy talking to you because you are always doing so much research and constantly learning and educating yourself and reading research and going to conferences and interacting with the top people in the field to pick their brains as well. So thanks so much for contributing to the conversation here on the Myers Detox Podcast.

Michael McEvoy: Thank you so much for having me Wendy.

Wendy Myers: And on that note. So could you talk a little bit about RCCX and how maybe that can impact one's ability to detox? We don't want to forget that important piece of the puzzle.

Michael McEvoy: Absolutely. Because one of the things about detoxification that we need to really pay attention to is our connective tissue. Wendy, I know I've talked with you about this before. We had a really good conversation before about how toxic heavy metals like mercury and aluminum and cadmium, so these are positively charged toxic metals, they have a plus charge. And so basically anything with a positive charge will grab on to anything with a negative charge.

Michael McEvoy: What's really fascinating is that our connective tissue is made up of negatively charged sulfur, negatively charged sulfate. That includes chondroitin sulfate, that includes our heparan sulfate, that includes glucosamine sulfate. These are the components of our connective tissue that have a very strong negative charge and will be attracted to positively charged toxic metals. Now there's no shortage of aluminum in a person's body. I can guarantee anybody that right, that anyone that's listening to this is loaded with aluminum, and how do I know? Because we've been running tests for over 10 years and we find aluminum in every person's body.

Wendy Myers: That's the same with Dr. Bruce Jones, our medical director and myself. Every single person has aluminum. If you're doing hair or urine and stool testing, every single one.

Michael McEvoy: If you're not showing aluminum on a test, you're just not excreting it, that's even a bigger problem. Most people are also toxic with lead, with cadmium, with other toxic metals also. All of these toxic metals are going to interfere with your immune system as well as with your connective tissue, not to mention your brain and nervous system. Because the RCCX phenotype is not ... They're programmed genetically differently, these different physiological systems don't work the same way, they are highly susceptible to the onslaught of toxins and there is no way that the environment we're living in is going to get any less toxic.

Michael McEvoy: So the RCCX people that we work with, we have to really be proactive about addressing the toxicity component on a regular basis. That's one of the first things that we do. Mold toxicity is another one that is a huge toxin that people are exposed to. So all the different chemicals and heavy metals in the environment as well as mold and mycotoxins that we're being supposed, that we're breathing in or drinking or inhaling or adjusting on a moment basis are affecting our physiology in very powerful ways. That includes our connective tissue, that includes how our immune system works.

Michael McEvoy: Remember that it's our immune system that's involved in detox. It has to gobble up toxins in the blood and in the tissues. And the lymphatic system is a part of our extracellular matrix. Without our lymphatic system, forget it, you can't detoxify anything.

Wendy Myers: Fantastic. Well Michael, again thanks for coming on the show and giving us some few tips on detoxification and how some people are not detoxing. We know that our sickest clients are having trouble with detoxification or detox pathways aren't working correctly for so many different reasons, all of the above that we talked today on the podcast. So it just speaks to like the more ill you are, you tend to have more toxins as well.

Wendy Myers: Michael, again, tell us where the listener can find you and work with you.

Michael McEvoy: If anybody out there that's listening is interesting in this kind of work and may even think that this fits their family profile or their profile, you can go to our website. It's www.metabolichealing.com. That's metabolichealing.com. My website is devoted to cutting-edge scientific research and in providing very high-quality content for the readers. We also do clinical one-on-one consulting and we also work with clinicians. So if you're a doctor, if you're a health care practitioner, if you're a nutritionist, a dietician and you're looking to get more cutting-edge educational courses and training, we provide that to our clinicians as well.

Wendy Myers: Yeah. You have lots of practitioner courses.

Michael McEvoy: Yeah. We have five practitioner courses. The fifth one that was just made is on the RCCX gene cluster.

Wendy Myers: What are the other courses that you have?

Michael McEvoy: The other courses are functional nutritional blood chemistry analysis, mastering functional laboratory test analysis, blood sugar and insulin resistance, and then methylation and MTHFR.

Wendy Myers: Yeah. It's fantastic. And I've taken one of your courses before too. Amazing education that you have provided for practitioners and software also that you've developed as well.

Wendy Myers: So everyone listening, please go to Michael's website. I encourage you to read on his site. He has so much cutting-edge stuff, amazing courses. It's a fantastic resource that he created.

Michael McEvoy: Thanks Wendy. I appreciate it.

Wendy Myers: And everyone, thanks for tuning in to the Myers Detox Podcast, where we explore every topic related to heavy metal and the chemical detoxification and symptoms and illness as well and testing. So thanks for tuning in and we will see you next week.