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Epigenetics in the Environment: An Exploration of Genetics & Chronic Health Conditions

Dr. Chapa:

While most practicing physicians are aware of Mendelian genetics, the area of epigenetics is a much more complicated field of study. Epigenetics, as a scientific and medical discipline has greatly developed in the last several years and is helping to explain a variety of long-term, chronic health conditions. But what does the incorporation of epigenetics in the healthcare practice actually look like? Welcome to *Clinician's Roundtable* on ReachMD. I'm your host, Dr. Hector Chapa and joining me in this discussion is Dr. Julio Jimenez. Dr. Jimenez is a licensed chiropractic doctor who has evolved his practice into an evidence-based wellness center with a special focus on epigenetics testing and health promotion. Dr. Jimenez, welcome to the program.

Dr. Jimenez:

Thank you, Dr. Chapa. Thank you very much for the opportunity and it's a privilege and a pleasure being here with you guys.

Dr. Chapa:

You know, I find this topic very, very interesting because it is night and day from when I trained. And as we start this discussion, Dr. Jimenez, I am sure that most practicing clinicians are aware of Mendelian genetics, the addition or the loss or the modification of the physical DNA strand, itself. We all get that. But epigenetics is different. So, can you please explain to us non-geneticists what epigenetics actually is?

Dr. Jimenez:

Yes. One of the things back in the Mendelian era, the guy was way above, beyond his time. But since the genome has been, laid out, has really changed so many perspectives of genetics. And the way I see genetics is that the epigenetics is basically the i.d. of who you are from your parents, and it's laid out completely, and what's within it, alright, we're talking about the 3 billion, codes of genes that you have within it, and it's not a DNA per se changing, right? It's not gonna alter your DNA, it's what you already got within your DNA. So, in the way I look at this is that when you have a mutation or your, called snips or variants in your genes, we need to know in epigenetics is this substance or this gene expressed or not expressed?

Dr. Chapa:

You know, when I was first learning this, Dr. Jimenez, I mean years ago, and see if you agree with this because I found this very interesting, as a visual. Somebody explained this to me years ago as a paint-by-numbers. So, the numbers that are in front of you in this diagram or in this picture is your DNA code. Now, some numbers can be missing, or some extra numbers can be added, but you have now in your possession the colors that you get to put over those numbers and you can modify the colors despite what the numbers show. So, the epigenetics, I thought that was very interesting, see if you agree with that, is how you can modify or affect the overall picture of your genetics by turning off or on certain sections, meaning you can change the different colors on the picture and not necessarily follow the numbers as given. What do you think about that? Is that fair?

Dr. Jimenez:

Yeah, it's completely fair. So, let me explain a bit of the essence of the anatomy or function of the DNA. So, the histone is a protein, it's a cylinder protein in which all your DNA is wrapped around to it, right? That's how we create all this information into tiny little space is through this histone proteins. And what they do is that you wrap around all of this information on this histone, OK? And that, the everything that's wrapped around your histone is not expressed. What's expressed in your phenotype of who you are is the connection between that histone and the next histone, right? That's the expression part within our system, right? What's in between each histone or these proteins. Now, what you're talking about, what I want to explain in epigenetics is that when I'm looking at a client or my patients,

right, you might have a lot of mutated genes that come from your mother or your father right, and the bad expressions or the mutated genes are gonna be wrapped around in that histone, right, that is not expressed. You can take that to your grave without ever becoming expressed.

What I'm trying to help my clients is what happens is that how can I make, if I have, let's say a bad gene of, I don't know, let's go with BRCA, alright. So that's within the histone, but let's say it's right by the unwinding of this histone, what unwinds my histone, or what unwinds my information from that histone are going to be two things. One is going to be environmental factors of chemical impacts, right? What you eat, what you drink, what you breathe, what you smoke, right? So, you get all these chemicals, alright, that are gonna stuck to a thing called histone tails. So, in this protein, you have a bunch of little tails that that actually all these chemicals they come in from the bad environment, they get attached to this histone, and by getting full of this histone tail, it's get full of these chemicals, it creates an unwinding which now that, that bad gene is becoming what? Expressed. It came from what? The environmental factors. So, that's kind of the turning the color on.

So now, another thing is in which I know that you guys probably heard of is going to be methylation, right? So, the process of methyl groups is also a big unwinding of my information to become expressed. And that would be methyl groups, right? So, if my body is not methylating, then it doesn't have enough methyl groups to tighten up my information on the histone, so it never becomes expressed then that no methylation or low methylation is gonna unwind that information and now I got that active gene within my system that's causing problems in my health.

Dr. Chapa:

This is for all of those listeners, very good news, because if we have a patient or you, yourself, I mean this could be a healthcare provider has a mutation that we are let's call it what it is, very afraid of, let's say we have a BRCA, we are BRCA carriers, that does not mean that you are doomed to disease. Correct, Dr. Jimenez. Because it has to do with how that BRCA is turned on or off and that's exactly what you're talking about here. And that is beyond BRCA mutation itself, that is epigenetics, correct?

Dr. Jimenez:

Correct. Exactly, so if you have the BRCA gene, do you have the power to, to express this gene? Yes, you do. And that's kind of how I feel because if you have the power to control your environmental factors then if that BRCA gene can be sustained within that histone, then it will never become expressed. You will take that to your grave, right? Without ever becoming expressed. So, that's the reason why, within the biochemistry of it, I always look at the methylation cycle, right? Why? Because if my body is not methylating correctly, then that means that my expression of my genes could be turned on, not only turned on, or turned off.

Dr. Chapa:

I'll be devil's advocate here, for our listeners, because someone is right now in their desk, driving or, jogging on their treadmill and listening to this, and saying, 'Well, where's that, where's that data?'. Well, I can very quickly summarize that. There are monozygotic twin data, right, so identical, identical DNA who actually do carry something like well let's say BRCA's, since most are familial. But they are raised in different geographical areas. And guess what the data shows? And Dr. Jimenez, please tell me this is correct, because this is what I've understood. Based on their same genetic code and carry both the same mutations, they can actually alter their risk or elevate their risk or actually have true disease outcome based on their environmental input. So, it's not just the DNA itself, because those identical twins that were separated and raised in different parts of the world actually have different breast disease or ovarian disease outcome. So, that does prove there's something else to that, isn't that correct?

Dr. Jimenez:

Completely. Completely right. So, and this is a reason why I love epigenetics because I still see that most of us, you know, for me in wellness, I talk all about, you know, nutritional and about chemical imbalances, especially in the hormone imbalance, right? So, I focus on those areas because I know that it is essential for you to have a healthy life and a healthy body, a longer life in and without disease, you have to start taking care of yourself because it does turn on in the genetic, right? Because at the end of the day, you know, to me, it's like the new paradigm is the principles of just chemistry, right? And all these variants that you might got from mom and dad, not necessarily that they're gonna be bad for you is that if you turn them on, right? So again, this is, kind of, what I do in the process of my patients, and, and how I deal with them. So again, that is a very good example of epigenetics, for sure.

Dr. Chapa:

For those just tuning in, you're listening to *Clinician's Roundtable* on ReachMD. I'm Dr. Hector Chapa and I'm speaking with Dr. Julio Jimenez about epigenetics and the whole principal about methylation of the DNA.

And Dr. Jimenez, I know that you've done a lot of studies and applied some concepts regarding the GI microbiome as it applies to overall health. Of course, a lot of data on the GI microbiome, but what's the link between the microbiome and epigenetics, or the methylation process that can lead to disease expression?

Dr. Jimenez:

Definitely. So, one of the things that, you know, in this study that has been done on what are the genome or in the genome, what are the variants, right? What are the snips, right, the single nucleotide polymorphisms is telling me which variant is affected and within studies says which of those is affecting my digestive system? So, there's a few of them that I look at in my practice when I'm having problems that I've done all the cleaning, repairing, and restoring within my patients in the digestive, and especially within the microbiome, one of the biggest things that I want to look into genetics to see if they have certain mutations that could be activated that could be affecting this. One of the big ones that I look at is called the FUT2 gene, right? So, the FUT2 gene really is telling me if one of your parents or both of your parents have given you a negative, or a variant right, a mutation in that gene. If that's the case, then that means that my body is no longer producing the good bacteria, right? So, my flora is affected by that gene. And if I don't look at that gene and I see my patients not getting better, right, or they're having a lot of dysfunctions and still having a lot of bloating, gas, you know, diarrhea, any of those things, can that be affecting my digestive system? Most definitely. So, the solution to that, to me, would be, I'm gonna provide my patient 500 billion probiotics at whatever strength we have or even going more into the testing of the bacteria within the flora. So, again, when I'm looking at that, I'm looking at those areas in the microbiome. If we get results within that, then we know that that genetic mutation was what? That's, kind of what was the problem. So now, we cannot change the gene, but we can provide that substance, right? That's gonna make the function of the body better because we're providing for it.

Same thing with like we talk about methylation right? Same thing with methylation. If your body cannot, if your body cannot methylate, then we, you know, we're gonna give it what? That's the reason why we give methyl B12, right? In the methyl form, because if your body cannot convert it, at least we're giving it to you because we can't change the gene, but we can provide the substance that's gonna what? Take that chemical reaction to the next step, right? So again, when we're looking at biochemistry, it is so complex, right? But at the end of the day, once you start figuring it out, it becomes very simple.

So, there's other genes, also in the digestive in which I look at, especially with celiac disease, right? There's a gene called the HLA gene that really tells me a little bit more, you know, if you have, you know, increased chance of creating celiac disease, right? Or a little bit more into that lactic-based big world of gluten, right? So again, that's another gene that I always like to look at which tells me, and there's other little genes, that makes me look into like the MCM6 gene that tells me a little bit more, you know, if your parents have given you a mutation there, it could be affecting how you break down your dairy, right? So now you don't have lactose intolerance and how that goes.

Also, there's another gene that I look at that really is huge and that's gonna be your histamine, right? There's the gene called the ABP1 that tells me in the mutative, if it's mutated, it's telling me how your body connects with histamine, right? And the reason why we look at this in the digestive, right, there's two genes that look at. How is your body excreting histamine and how is your body breaking down histamine, right? So again, the ABP1 tells me how your body's excreting the gene and the HNMT tells me how is your body breaking it down.

Dr. Chapa:

It's not just the genetics itself, what's in the cell in the DNA, but in other words, it's part of the environmental, it starts with our normal healthy GI flora that can otherwise impact long-term chronic disease, correct?

Dr. Jimenez:

Correct. And the reason why I was talking about histamine is because histamine plays a big role in inflammatory dysfunctions in your digestive system because it produces the substance called zonulin and as, you know, zonulin is one of the biggest, highest inflammatory what? Dysfunctions in your body, but especially in your digestive system. So, if you're having zonulin, now you have a chance of what? Dysfunction to your gut. And now you have autoimmune leaky gut, now you're creating Crohn's, now you're creating all these different dysfunctions and it began by a lot of that histamine, right? So now, if histamine is a dysfunction, especially the symptomology, right, if my patients are having tons and tons of allergy reactions, one maybe their body cannot excrete the histamine and the histamine is running around over and over in your blood and now you create all this anaphylactic dysfunction, right? And all these different, kind of, and you cannot find antihistamines strong enough to help 'em, right? Why is that happening? Well, that's because that mutation within their genes cannot excrete that, right? Or cannot break it down.

Dr. Chapa:

The really take-home message about epigenetics is while we are definitely products of our genetic code, we don't actually have to be, and we can modify that. And that's the whole purpose of epigenetics. And as you mentioned, it's tied even to what we put into our body and that relates to the GI microbiome. So having said that, those two influences, what we cannot control, which is what we're passed down by true Mendelian genetics, and what we can control, which is environmental stimuli and even things like our diet and to large effect, our GI microbiome, comes this last, more philosophical question. And as we wrap this up, I wanna see what your thoughts are.

Now that we've known this issue of epigenetics and the influences that it has on our genetic code, are we products, Dr. Jimenez just of nature, or of nurture, or of both?

Dr. Jimenez:

Awesome question. Really makes you wanna think of how it is. I believe that we have the raw data from our genome, right? And we have a choice of making that better or worse. And this is the advice to my clients or to who your patients are is that it's not just about symptomology and giving you the next medication, or the next supplementation to decrease your symptoms, it's about restoration and healing. And it is your choice, after all. We just do is what we have the tools to tell you what to do and how to do it, it's up to that person to have that concept to say, 'You know what, it is my nature to do something good for myself and it's gonna help me all the way down to my genetics.' And that is huge, right? We never knew this information before and now that we have this in our hands, let's use it. Let's use it.

Dr. Chapa:

And I do believe that the answer to that question is actually 'Both.' Yes, there's things that we cannot modify, which is our direct physical DNA code, however, a lot of that expression has to do with our behavior: smoking, proper diet, the environment we live in, and how healthy we choose to be. So, I absolutely am convinced with epigenetics that it actually is both, we are both products of our genetic code and what we do with that code.

This has been an eye-opening look at epigenetics and new insights that we have on it. And I want to thank my guest, Dr. Julio Jimenez, for joining me in this discussion. Dr. Jimenez, it was great having you on the program.

Dr. Jimenez:

Thank you very much Dr. Chapa.

Dr. Chapa:

I'm Dr. Hector Chapa. To access this and other episodes in our series, visit ReachMD.com/CliniciansRoundtable, where you can Be Part of the Knowledge. Thank you for listening.