



**Transcript of “Dr. Ben Lynch: MTHFR Gene,  
Overcoming Disease, & the Dangers of Folic Acid”**

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Dave: Hey everyone, it's Dave Asprey with Bulletproof Radio. Today's cool fact of the day is 98% of kids with autism have a mutation in their MTHFR gene. Those with mutations have autism at a rate 1.7 times greater than the normal population. That is not to say this is something that causes autism but maybe it is part of the incredibly complex puzzle. The interesting thing is that a lot of people that don't have autism including yours truly have this mutation as well. In fact somewhere around 1/3 of people depending on which mutations we are talking about can have this. So today's guest is going to talk about this specific mutation, how to tell if you might have it, how to test for it and what the implications are for human health, not just for in autism but in everything.

This new kind of science around what do your genes do and what do they do in response from environmental inputs including nutritional supplements, including nutrients that are just actually in food that naturally occur or medication or things like sleep and exercise levels. The environmental inputs are as important as the genes you have. But understanding the genes maybe lets you hack your environment so that you can live in a world that is more suited to your specific strengths and one that doesn't make you weak. Certainly learning some of these tricks for my own use has been a major part of bio-hacking. It has been tough to find people like Dr. Ben Lynch, today's guest who are really well equipped to talk about this. As a sign of how well equip Ben is to talk about this when his camera zooms out you are going to see that he has methylation pathways on a poster on the wall behind him and I actually have poster envy right now. Ben welcome to the show.

Dr. Ben Lynch: Thanks Dave. Well, I have old bio-hacking envy and 5-year-old brain envy from your previous story.

Dave: If you are watching on video on iTunes instead of just listening in your car behind me there is a blinking light and what that is is part of an old bar game that tests your memory. Probably from around the early 1980s so it is a very old video game but it is one that just tests your ability to remember a string of colors and my 5-year-old Alan has just about doubled my top score. In fact it is kind of amazing what he can do. He just sits there and remembers these long, long strings of blinking lights that are incredibly so it is one of the few video games he actually gets to play but man he begs for it everyday.

Dr. Ben Lynch: Nice.

Dave: So Ben, you are one of the top MTHFR guys, you're a doctor of naturopathic medicine and you run; or you are at least Chief medical officer of Seekinghealth.com, which really are looking at or things that help you look at things like toxins and how they affect your brain and how they affect your body and even like what we have done with the environment. This is just an incredible opportunity for people listening to learn about stuff that just doesn't get talked about. I want to know. How did you get into this stuff? This is about as kind of esoteric and unusual for a naturopath or a western physician either type of medicine to get into. How did this happen?

Dr. Ben Lynch: It happened I think it has always been a passion of mine to identify the root causes of illness. Just like you trying to find and pinpoint the most effective things you can to promote health and prevent disease. When somebody asked me about bipolar disease and I was just rattling off our usual things that we do in holistic medicine to improve this condition I said "you know I am kind of a stale on my research so I will just check it out." So I typed in bipolar and I knew it had to do something with folate so I typed in "bipolar folic acid" because back then I didn't know that folate was the appropriate term so I typed in folic acid and one of the first papers that popped up was something about MTHFR and I didn't know what the heck that was, so I typed that back in the pub and out came this laundry list of main headings in pubmed

talking about cardiovascular risk, cancers, autism, infertility, pre-eclampsias, depression, bipolar, anxiety and that is in the title of every pubmed paper talking about MTFHR on the first page. I said "okay, why haven't I heard about this?" I started digging more and more and more about it and I discovered that it is so essential to our biochemistry and if I turn this off now I don't see... I don't know can you see my nerdy little calendar here?

Dave: That was a fast transition for people not watching the video.

Dr. Ben Lynch: That is alright.

Dave: We are talking about that poster on his wall and his camera finally zoomed out for us to show us this giant, incredibly complex interlocking set of circles that shows what we know today about how our body detoxes and processes certain things so it is remarkable science there, kind of hard to follow if you are not seeing the camera and so you were saying you were really like "okay, bipolar what is the deal?" And you found an unusual study and you dug deeper and what did you find when you read some of the papers on MTFHR?

Dr. Ben Lynch: Well, the first thing that hit me was MTFHR big time effects our ability to metabolize that conventional nutrient that we find in our processed foods and which is folic acid so folic acid for the general person isn't that great by any means but it is still useful. It has reduced neural II defects, it has reduced certain conditions and so on and but the same times those with MTFHR or other interruptions in the folate pathway cannot metabolize that folic acid very well and so we are left with this nutrient of folic acid that should be helping the general public but it is actually not as well as it could be because the actual type of folate that our body uses has to be converted into methyl-folate so so folic acid is way, way up here. It is basically if you were building your house and you just have a foundation laid and that is all you've got but you need to have the roof and the windows and everything else and you have to get all those steps done and the very bottom step you have your furniture in your house and that is MTFHR producing

this end product of methyl-folate. If that is not working very well then the bodies number one form of folate is not in the amount it needs to be in your blood and it is actually quite low and the downstream affect of that is very, very significant. We are talking neurotransmission, cancer prevention, energy and so on. It is really significant.

Dave:

If you are listening to this right now and you go to your vitamin cabinet and it is amazing how many houses you go to that have a vitamin cabinet, in fact more than do than don't these days in my experience. This is where you keep the 1,2, in my case way more than one bottles of supplements that you use sometimes or everyday and turn anything that has a Barbara complex label on it or anything that is a multi-vitamin and look and see if it says folic acid and the odds are that is says folic acid or even worse it says folate in parenthesis folic acid, which is a slight mis-labeling and what this means is that the manufacturer, I say this as a guy who helps formulate supplements, the manufacturer made an economic decision to use a much less expensive form of this Barbara vitamin that unfortunately has negative affects on some of us and we don't know who unless you have done unusual testing, or if it actually says 5 MTFHR or if it says folinic acid or it says folate and you they don't tell you you are actually getting a vitamin from a supplement manufacturer who is paying attention to the core sciences besides the economics and this is something that actually kind of pisses me off because there are laws about putting folic acid in bread but why folic acid when for some people it is harmful and others it is beneficial, shouldn't we put nothing in that is harmful to some people?

Those things just sound kind of small but you are saying neurotransmission, cancer. What are the other effects that we are talking about there?

Dr. Ben Lynch:

Well, energy. You've got your coffee and your oil for energy and I utilize methyl-folate and B-12s as my energy and I am caffeine free. I do munch on your coffee beans at times. I am guilty of that but I think in weight loss diabetes there is a lot of research in

terms of methylation and diabetes and how that gets inhibited and there's a metabolic shift that happens and that shift goes from aerobic to kind of more anaerobic so the glucose is just kind of budding against the cell membrane, it's not getting in so it is causing diabetes.

I don't want to get too scientific on your guys but the bottom line is it is how you think, it is how you reproduce, what you produce at the end of that. Is it a healthy child that can kick my ass in that memory game behind Dave or is it your inability to reproduce because you are infertile or living a long healthy life because you are cancer free and your joints are mobile and you've got energy and you feel good and you can think well. Just the core basics of life revolve around this gene and this gene defect and the majority of us have it.

Dave: Oh, the majority of people have the gene defect?

Dr. Ben Lynch: The majority of us have it, yes.

Dave: Oh, I thought you were talking about hetra, not homeo...

Dr. Ben Lynch: Hetero, correct.

Dave: Explain what the hetero and homo is for people who are listening and aren't geneticist.

Dr. Ben Lynch: When you talk about genetic issues and this is not a mutation where I don't have my right arm, the genes still work. They just work at a less efficient ability, so imagine a wheel barrel with one handle on it versus 2. Kind of hard to drive. If you have the MTFHR genetic defect, which limits your ability to convert to simplify things folic acid into the bodies number one form of folate, which is methyl-folate you have a reduced capacity if you have one bad copy, which is heterozygous and you get 2 copies, you get one copy from your mom, one copy from your dad and they reproduce and you get one of each and then say your mom gives you the good MTFHR gene and then your dad gives you the

bad one, then you are heterozygous. IF they both have it and you get the bad one of each now you are homozygous. So hetero meaning one, homo meaning two in this situation.

But if you have one of these genetic defects, polymorphism is the scientific term but I will say defect because it is easier then you have a 30% reduced capacity to produce methyl-folate. That doesn't mean you have a 30% capacity to utilize methyl-folate it means you have a 30% ability to produce it. That means if you are taking folic acid and you are not eating your leafy greens you might be in trouble, especially if you have MTFHR. If you have 2 copies and you are homozygous now you are talking about a 70 or 80% reduced capacity to produce methyl-folate. That means you have got some serious issues if you are not eating your leafy greens. Now, it doesn't mean we are all in trouble if we are eating our leafy greens but our foods, now they are sprayed with crap on them right and they are genetically modified. They are transferred thousands of miles on planes or boxes and picked early. The soils are depleted so the fertilizers have a high nitrate level and that is causing issues too. There is a whole bunch of things that is not just about leafy greens, you have to look more into that now but fortunately, but my point is a lot of us have some MTFHR defect it is very essential to our biochemistry and if you have blood clots in your family or any type of mental disorders. I was really, really saddened to hear about Robin Williams and his suicide and that really pained me because the guy was a real talent and he was an addict. He was an alcoholic and he blatantly said it multiple times and he was trying to seek help and he probably was off and on the wagon multiple times right?

If you have somebody who is an addict the first thing I thought was his dopamine levels are too low. I wonder if this guy have MTFHR or any type of genetic polymorphism that is affecting his biochemistry and if he went to a good physician they may have turned him around, removed his alcoholism completely. Therapy isn't very useful if there is a biochemical block.



- Dave: If you look at some of the media reports it looks like he might have been on a vegan diet or an extremely low fat kind of diet. There are various reports on that but he had made changes about 3 years ago that for people with depression would make it worse and not better and if he had the genetic defect you are talking about; this is totally speculation, neither you or I know what would have happened. So he is eating more leafy greens that are high in folic acid but not methyl-folate. What would that do to someone with depression or bipolar, I have no idea what Robin Williams had, we don't know lots of stuff about this, so this is not to say this caused it but as a current even example, you got a guy increases folic acid intake from leafy greens, who lets say has a mutation and is prone to depression or other psychiatric things. What is the likely set of steps that could happen there?
- Dr. Ben Lynch: Before I get into that I want to define something that is really important because I don't want people to get scared of leafy greens.
- Dave: No, no. Me either.
- Dr. Ben Lynch: Folic acid is not found in natural foods, so if they are processed or man-made or people-made to be politically correct then these natural foods contain multiple foods of reduced folates. Reduced folates meaning the body can readily use them.
- Dave: But not the methyl-folate right?
- Dr. Ben Lynch: Methyl-folate is in less amounts than these things. There are more dihydrofolates and tetrahydrfolates, which is absolutely correct. I don't know how much methyl-folate is in foods, if any...
- Dave: But it is not chemical folic acid that is in the synthetic supplement that they are using?
- Dr. Ben Lynch: That is right.
- Dave: Okay.

Dr. Ben Lynch: Looking at a vegan diet or vegetarian diet and saying that Robin Williams was trying to improve his health by going this route. The body is amazing and has multiple back-up systems. If you have an MTHFR defect then the body says "look if you are not getting your reduced folates I am just going to utilize your protein and use something that comes from meat and I am going to take this colliene and I am going to recycle this homocysteine back into methylamine back into you San-An which is your main methyl donor. My point is here is a vegan or a vegetarian many times are carbatarians.

Dave: Yeah.

Dr. Ben Lynch: Point one. They don't eat their veggies and if they do they might be processed or what we already talked about and the other things is these foods don't have adequate B-12 and even if you eat all the leafy greens that you want; I know a lot of people talk about B-12 it is made by bacteria in your gut and so on but that B-12 and bacteria in our gut it is not utilized by our bodies it is utilized by the bacteria so it doesn't affect our metabolism, okay? B-12 and bacteria it is not releventfor our biochemistry.

Over time men don't have menstrual cycles so we don't get anemic and so on but I mean if you are an alcoholic or you are drinking alcohol you need high level of B-12, big time and you need high levels of methyl-folate. If Robin was drinking and he was a vegetarian and he was night eating meat to be redundant I guess his methylation was severely hampered. Now, his ability to produce neurotransmitters and also to eliminate neurotransmitters has gone down the tubes and also his ability to turn on and off genes has gone down.

I believe he started getting some form of Parkinson's too right?

Dave: I am certainly not an expert on all the things going on with him.

Dr. Ben Lynch: But that just kind of shows that not only do we have a neurological disorder but now we have a mitochondrial disorder

and a neurological disorder so it becomes multiple steps. I can go on and on with this and I don't want to but I just wanted to say that vegan and vegetarians you know while I congratulate and I understand the desire to do that absolutely because I was a vegetarian for a couple of years myself but I didn't do well. Now that I am MTFHR compound heterozygous I have one copy of each my ability to produce methyl-folate is down by about 80% it kind of makes sense why I didn't do so well with that. I wasn't getting my B-12 and I was exposed to Round-Up on the ranch and a lot of hard work and processed foods and so on. I think that we just have to keep in mind that strict life-style diet; I know you are writing a diet book, these diets are essentially dangerous. Except Dave's.

Dave:

It is possible mine is potentially dangerous but I'll be damned if I can find out the mechanism for that and if so I will modify it with the next rev that comes out because that is what science does but I was a raw vegan for a while and I also started to... I had very definitive benefits, most people do for the first 3 months because they get an up regulation actually of mitochondrial function from the surge of Omega-6's but it short lived. They feel good, they think this diet makes you feel good, then you go down. I call it the vegan trap and it is not like a bad thing to be vegan for a short period of time but if you do it for a long period of time some of the bad chemical pathways that we are talking about become more and more important and you have got guys out there who are complete ass-kickers who are vegan and I think if we looked at their genes I would love to be like "Oh, Rick Roll you are a god among men and you eat this complete diet that would be worse than kryptonite for me, and what is the genetic difference between us?" We are working on solving some of that and I am talking with a bunch of different companies today who are looking at getting your genetic sequencing from 23andme from another service and then crunching it and running it against 1000 other data points that we have to come up with like "maybe you are more carb tolerant." "Maybe you can have 100 grams and you can only have 30 grams." "Maybe you are okay on folic acid." We just don't even have the basic science done for probably 99% of those

things and it will come over time and in the mean time what you are doing is very much pioneering by looking at this one thing because it affects you said the vast majority, what percentage of people have at least one of the 2 defects that they could have?

Dr. Ben Lynch: Well depends on your ancestry. I mean the Italians the Hispanics, my goodness Chinese are very high rate I am talking 50% of the population have 2 copies of MTFHR, so they are homozygous for that. Upwards 50% of those ancestral groups are very, very prone to having MTFHR homozygous.

Dave: So if that wasn't enough, so if gluten intolerance wasn't enough to get you to eat flour and grains. If you are from one of those genetic ancestries you said Hispanic, Chinese and Italian?

Dr. Ben Lynch: Yes.

Dave: Then the odds are at least in the US you are getting folic acid enriched flour when you eat wheat products and that are likely; genetically more likely to anyway to cause problems with you.

Dr. Ben Lynch: If you go... I have only been to Mexico a couple of times and I was not in the rural beautiful parts of Mexico. I was in Tijuana getting my teeth fixed, but they eat a lot of meat right? It is interesting that they have this MTFHR defect and they eat a lot of meat and you think that is bad but it bypasses that MTFHR defect but it only bypasses it in the liver and the kidney and the testicles and some other parts whereas the MTFHR supports the cellular biochemistry in all cells. It is interesting to... the backup mechanism of eating protein and meat. I should say meat. Is supportive but it is mainly supportive in the liver and the kidney it is not supported really in the brain or elsewhere in the body. These backup mechanism but they are not as supportive as taking methyl-folate or methylcobalamin.

Dave: Is this one of the reasons potentially, not the only reason but a contributing reason that a basic paleo diet might work for some people because it is reducing their folic acid intake from grains? I

mean grains have all sorts of other problems they do but I never thought as that as being a contributor but could it be? In your opinion?

Dr. Ben Lynch: It could be. I don't know what their carb load is on paleo.

Dave: It depends on who you are. It has been spread kind of thin. The 8 carbs crowd and then there is the if you are no in ketosis you are a bad person crowd and everything in between.

Dr. Ben Lynch: Original paleo they talked about just kind of the parameter of the store right?

Dave: 0% and essentially veggies and a few nuts and not too many because you might get carbs from that. It was very much a ketosis kind of diet.

Dr. Ben Lynch: Yeah, I think that the amount of carbs is really important. I am not a carb counter, but I personally do very well with more protein. I am 6'5" and about 210 pounds but I do a lot better with protein than I do carbs. I haven't necessarily figured out why yet but I think I am... steer me back Dave, what was your original question?

Dave: I was wondering about when it comes to a paleo diet when you eliminate grains, you eliminate a bunch of stuff that also come in grains, you have all of the immune systems sensitizers, the problem with gluten itself, you eliminate the microtoxin problem in grain, which is very well established and which levels are causing problems for which people is also genetic so a bunch of people who are having grain mold symptoms don't know it, they eliminate grains and magically they are better but I am also thinking there is a contributing factor for people who have folic acid problems. We dump folic acid in the chemical form in our grain then you eat it and it builds up and basically gums up your mitochondrial and your methylation pathways. I don't know how big of a contributing factor that is based on all these other things that come along with grain, oh and Round-Up, which is also sprayed around the grain to make it ripen on time.

Dr. Ben Lynch: And glyphosphate.

Dave: Yeah, glyphosphate, Round-up right?

Dr. Ben Lynch: It's a great point and I think people also need to understand; I hate folic acid. I don't use that 4 letter word very often because it is very strong and very negative and just not a nice word but folic acid qualifies and it qualifies because not only is it man-made and has to go through multiple steps in order to be useful for your body but when you order a blood test from your doctor and it looks at serum folate or it looks at serum cobalamin or B-12, it is garbage, it doesn't mean anything. It is outside your cell. All the action is happening inside you cell.

If you are looking at your serum folate and it is high you are thinking "oh, that is good." But it is actually not because you don't know what type of folate it is. Especially what can happen is if you are consuming grains like Dave was saying or these processed grains or your vitamin drinks with rich folic acid or your supplements with enriched folic acid or your granol energy bars because you are a runner and you want to have your energy bar after practice or so on and you get folic acid there too so now you are upwards of a couple grams of folic acid a day. Folic acids binds to these receptors on the cell, which are intended for the good folates, the useful folates that get in there and actually do some work. Now, folic acid will bind to the receptor and sit there and it will prevent the good folates from getting in and doing their thing. That is bad, that is strike one.

Strike two is folate has to be carried. It has to be transported around so you swallow your leafy greens, now it has to be carried and delivered to that receptor. Now we are backing up to the receptor, now the folate has to be carried to it. Now, folic acid will bind to these little carrying proteins and block the good folates from binding to that, so not only can you not get the good folates blocking the receptor from getting the good folates in but you can't even get the good folates to that destination. It is really bad

and it is especially bad in breast feeding women because what happens, nursing women, breast-feeding babies excuse me...

Dave: Haha..

Dr. Ben Lynch: That sounded really weird, but anyways so women who are breast-feeding there is a high, high concentration of folate binding proteins in breast milk, which make sense because these babies are growing at a high rate. Their methylation, which we haven't defined yet, but they are growing super fast and as you are growing your methylation status is heightened. As we age methylation goes down, unless you are exposed to chemicals and stressed out and so on. But any how breast milk is high in these and if they are taking folic acid based supplementation they are blocking the ability to deliver the folate to the nursing child, who then can't think or produce neurotransmitters or can't grow or methylate or whatever it needs to do. WE are stunting our future generation with folic acid too. There are papers, after papers on this.

Dave: Thank you for bringing that to light. My wife and I co-authored the "[Better Baby Book](#)" and it was a really comprehensive program, I looked it up about 1300 papers putting it together and it is what we did to restore her fertility and have 2 healthy kids at age 39 and 41. She is a trained physician. There is I believe a whole chapter in that book about the importance of getting the right form of folic acid and this came out probably 3 year ago, we started the research for this around 2004. It was amazing to see all of these papers but so few people talking about it and even more is pregnant women getting folic acid tablets from their trained physicians who have never had a class on methylation or folic acid, don't have any knowledge that they are doing something that is more likely than not harmful.

Dr. Ben Lynch: Right.



Dave: The cost of supplements is so low but also do you know the effects on folic acid versus folate on sperm in men? Have you looked into that?

Dr. Ben Lynch: You know I haven't. That is a great question. But I don't know. I know carotene is a super important one and in sperm but I don't know.

Dave: If memory serves and I am not citing a paper here because it has been a little while since I did all that research. If memory serves there is an effect in some people and like wow, I think it has to actually do with production in sperm not their motility. It is just one of those things where it doesn't really have a business being in supplements and when... I am the last guy to say we need more government regulation on supplements, which our drug company has been trying to take over that business for 20 years now but this is one of those times when we are like this is well known to be bad for a huge number of people and there is no reason to be using it yet we still do it and that kind of research on what the next generation gets but from what mom took even before conception as well as during pregnancy and while nursing. It is a simple upgrade to go from folic acid to a better form of folic acid and you don't need to get a blood test or anything weird to do it.

Dr. Ben Lynch: No, no, you don't. A lot of people ask me "should I test for MTHFR? Should I test for this polymorphism?" Well, it depends on who you are and what type of doctor you are associating yourself with. If you are not happy with your doctor you fire them. You fire them. It is your right to choose here and...

Dave: You are a licensed physician just so we are clear on this.

Dr. Ben Lynch: Yeah, I am. Right there is my wallet and I don't have my license in the state of Washington, I think it is in my wallet but yes, I am a licensed physician and when I was working with patients and I am a hard ass. I demand people be compliant and I demand a full disclosure of your history, you don't hide things from me and you have to build trust and rapport and you don't give me the door



knob diagnosis of your chief complaint. The door knob thing is like "oh, by the way I have HIV" "I was born with 2 heads initially." You've got to be absolutely clear with your physician. It is a team environment and if you are not feeling that collaboration or your doctor isn't give you the time of day they are just shuttling you in and out, you've got to fire them. You have to move on. If you are doing the research and you are doing all the homework for your doctor you have to move on.

My point here is your health is super important, you live once. Maybe, maybe more than once who knows but I think you got to take charge in your health and when I was working with people I put them through this and I do consults with some people, rarely but I do, anyway a tangetized. That is a word I made up "tangetized" again. So anyway, sorry.

Dave:

It is funny I spent most of my career working in Silicon Valley working for companies founded by Indians and it is very common when someone learns English in India they will basically verb their nouns, so anytime you want to verb a noun I am totally comfortable with that although all the grammar police listening right now are probably like... it is actually kind of cool. I do ti with my kids a lot. It really makes you think "language can do that." There I tangetized, but what we are talking about, you actually said fire you physician, it is funny because at the very start of really a lot of my past something was going wrong and I went to the doctors about 15 or so years ago. Pow-wow to medical association and I said "something is wrong" and it kind of gave me some rigamorol and started pricking my fingers "no, no it is not my blood sugar. I have holes in all my fingers but I have the data. Really." When I told him vitamin C would help me and I actually felt better from it, and I understand now that that was from a glutathione increase most likely but he basically said "stop, it will kill you." I said "what about Linus Pauling?" And he said "Linus who?" Now, I you are listening and you don't know who Linus Pauling is that is okay because you are not a doctor, but Linus Pauling had 2 Noble Prizes and he took 90 grams of vitamin C a day and was one of the leading researchers on what it does. So

this doctor told me 3 grams would kill me and when he didn't know who Linus Pauling was, I said those words "you're fired" and I walked out of his office and I didn't pay him. They spent 3 years trying to collect it. I said "no, services weren't rendered. Services weren't rendered."

Dr. Ben Lynch: Good point.

Dave: That said I have run the Silicon Valley Health Institute and anti-aging public education non-profit group for a decade. The last thing you want to do is go to your doctor and be hostile but you want to be listening and if you bring data and you bring your own test your own genes and you say "I want to look at this" and you are not being heard that is the time basically to insist on being heard and if you are not getting heard then it is time to find somebody who is going to listen because you are paying them to listen and you are paying them to diagnose and to be your partner in getting well and it is amazing if you come in hostile like a good physician, all the guys I respect, if you come in hostile they are going to give a little while to show they are trustworthy. After that they are going to give you this, the middle finger. They are going to fire you as a patient and I respect doctors who do that greatly. Sorry I can't help you. You got to come in looking for a partnership and if you don't get one, then you've got a problem.

Dr. Ben Lynch: Uh-huh. Yeah, being a physician is not easy. Doctor, it comes from the root docere and docere means to teach and our job is to teach patients, people how to live and we don't do that anymore. We inspect and poke and prod and scan and snip and cut and we send them out the door. We don't educate anymore. That old style of medicine it is basically it is coming back because of the flood of the Internet. Dr. Google is number 1 doc. Dr. Google is at the top of all the best doctor books now but it is... you have to be careful with that Dr. Google too. I think that; I tangetized again... but it's the repore is super important and when we are talking about a genetic mutation here MTFHR but the point of firing your doctor is important because a lot of doctors are going to the old saying of "poo-pooing this" it is insignificant. I can't tell you how many

people have recurrent miscarriages or their pulmonary thrombosis or they are throwing clots, recurring clots all the time or they are looking at the whole line of their family dying early of heart attacks and they are thinking "what the hell?" And they find they have MTFHR and they've got a significant snip. They are the homozygous 6774 the doctor dismisses it. You can't dismiss that. It is important. Research is loaded with facts. My point is if you go in and this all started about who should test for MTFHR and who shouldn't and basically if that doctor dismisses the fact that you want to test for MTFHR or you have brought in the test result for MTFHR and they are dismissing it as important it is bye-bye. But if they are willing to learn and become educated in it, then they are a gold mine and you stay there with them. No doctor knows everything and they never will. If they say they do, then get out of there. Who should order the MTFHR are those people who want to know for sure and who are undergoing significant treatments in the hospital, so if you using things like methotrexate for example you are undergoing cancer treatments or you have an auto immune disorder and you are taking methotrexate or any of these folate antagonist drugs then you need to test for MTFHR and show them because you are going to respond more poorly to these meds because they are too strong for you. Then you need to have that documented.

Now, if you are in kind of general pretty good health and you are not working with a doctor then you can just switch out and get rid of your folic acid and start taking good supplementation with methyfolate and your methylcobalamin and adenosylcobalamin and so on and clean up your diet and life-style and listen to Dave's podcast and take his oil and drink his coffee sometimes.

I have a really good research to support your coffee about adenosine levels but that is another...

Dave: Good.

Dr. Ben Lynch: But anyhow that is when you order the test but treating yourself empirically, coming from a doctor and I could get sued probably

for this but just taking good care of yourself and doing the absolute basics, sleeping, exercising, breathing, good social interaction with your friends and loved ones and avoiding stresses and so on and taking the good supplementation and being aware that even if you don't have MTFHR folic acid is bad, because it binds your receptors and it blocks your bodies ability to carry folate, so folic acid is bad for everyone whether you have MTFHR or not. It really is. I have tons and tons of research on that and I bad it up and there are a lot of MDs and standard docs who come to my conferences and they learn and they are applying it in their clinic as we speak worldwide now. It is great. There are doctors out there who are willing to learn.

Dave, what do you call a medical student who graduates at the bottom of their class?

Dave: This is my favorite joke of all time so I am going to answer it. Alright, you call them "doctor."

Dr. Ben Lynch: That is right.

Dave: This is maybe a more negative use of that joke, but it is kind of like if you goal is to get to a certain level you don't have to overachieve to get to that level as long as you are getting other things you want. I applied that actually in business school. I wasn't anywhere near equipped to be at the top of my class compared to some of my brilliant classmates but I was like "there are a couple of classes where you are totally allowed to basically, completely fail them and still graduate!" This is great. I will pick which classes I am going to fail right now and spend all that time getting to know these amazing people better. I will just get more of what I want." The idea there is look you graduated or you didn't and your point there about doctors, there are all sort of different levels of patient interaction, patient education and also different levels of just staying current on research. I know there are more than a few doctors who listen to this podcast and I intentionally bring on guys like you who are doing cutting -edge stuff, not so that every doctor can learn your level of knowledge but at least if we are all

aware of these things that they may matter it is easy enough for physicians to talk to their break time buddy who is also Dr. Google; "you know I had these 3 patients who aren't getting better and I have seen them 4 times..." and they put two and two together and they are able to help more people or maybe those people come in already asking because they heard this and that is kind of the vision for bringing up something like this that is not common knowledge but is affecting a ton of people maybe a lot, maybe a little, we don't know.

I did this test about, I want to say about 5-6 years ago I did the Amy Yasko full profile. Amy Yasko is one of the first researchers who looked at Autism and methylation pathways and that test was quite expensive, it was extensive is came with DVDs full of data, not all of which I looked at for sure but I did read her book and more recently and this is when a coaching client who is having performance issues; if they are interested in this stuff I will say "you can go to 23 and Me, you can get a \$99 genetic profile and you can go to basically a website like geneticgene" and geneticgene takes a donation and then they crunch your genome and then show you your methylation pathway and it is free but it is nice to give the guys \$20 for the work they did putting the site together. Then it takes you about 2 days of annoying clicking on snips to try and understand all the data, that is the hard part, but you can learn amazing things.

I have had my kids genetic sequences done. My kids don't get folic acid because they don't have the right genes for that and that is just kind of how it is, but I know and most people don't but the idea is that if you can afford to have an iPhone to listen to this, you can be in the car and listen to this you are talking about \$100 to know if you really want to know. Or you can just say "I am going to switch to a better form of mutli-vitamins and I am going tos top eating enriched grain products, which I shouldn't' eat anyway." Does that work for you? Do you use a different test? What is the way a listener might go about finding a test?

Dr. Ben Lynch: Well, I think your point of 23andme is... that is what I recommend if people are not isolating MTFHR. Isolating MTFHR is a starting point. It is where I got started. That is how I got into all this nutrigenomic stuff basically how nutrition affects your genes then that is how I started but then I was supporting people and some people got worse and some people got better and it was like "yeah, there is more than one gene in the human body here" so I discovered that there was all these different interactions and Amy Ascough definitely pioneered a lot of this and I have branched way out in terms of looking at their genes and how MTFHR interacts with this and that and I look at a lot more mitochondria affects and what else... mitochondria is a big one for me.

Dave: Yeah, me too. It is the core of how I perform better. I have upgraded my mitochondria via everything. If there is a study that says you can grow new mitochondria, yeah I'll do that! Holy crap the difference in my brain, it is unbelievable.

Dr. Ben Lynch: Right, mitochondria are so critical and they use folate. People don't know this but we have 2 types of DNA. We have nuclear DNA that is inside our cells, but then we have inside of our cells we have mitochondrial DNA and these mitochondrial DNA are the little power houses that make you run. It is your engine to your car and if your mitochondria are tired it doesn't really matter about your nuclear DNA anymore because if your mitochondrial DNA are hammer your nuclear DNA are in trouble. Actually it is vise versa as well, but the mitochondria is so, so, so important. That is going to be my next conference. Talking about mitochondria and the affect of methylation on it and cancer is a whole metabolic shift.

I presented to Cancer Treatment Centers of America and I totally what is the world... overwhelm them about how cancer comes into fruition in people and how I think we should treat it.

Dave: As a mitochondrial dysfunction primarily?

Dr. Ben Lynch: That is right.



Dave: There is a great case for that.

Dr. Ben Lynch: That was my most exciting discovery of how methylation is connected to mitochondrial function and metabolic shifts. I was so excited when I found that. It just kind of trails on and that is why I make these diagrams and pathways that I do. They are laminated so doctors can highlight. If you have an MTFHR defect it is here and then they can look at that and see if you have a hiccup here it is going to affect if you drink alcohol this is what is going to happen. If you have a yeast overgrowth this is what is going to happen. Now, you we know your B-12 levels are low and your B-6 levels are low this is going to shut down your glutathione production over here. You are stressed out over here because your dopamine levels and your norepinephrine levels are sky high and we need to lower those and calm those down. You aren't sleeping because you're serotonin is not converting to melatonin because you are low on B-5 and San-E.

Patients get this if they see it. Doctors get it when they see it. These pathways and writing them all out I think are really, really important. They will never, never end they will always evolve and this is super basic at the moment but it is going to get more and more complicated but at the same time traceable and trackable.

I think Dave when you ask about genetic testing and what testing they should do. 23andme I think is the best the problem is people can get stuck in the manercia and I also think people can get stuck in the genetics. You have to keep in mind that your reception to the environment, which Dr. Bruce Lipton discusses so beautifully. If you haven't looked up Bruce Lipton's work "Biology of Belief" you've got to do that. I think he biology.

Dave: He is actually one we quote a lot in the Better Baby Book because the idea that "oh, my god you can control your genes by changing your environment?" That is kind of ground breaking, what changes should you make? That was the point of the book.

- Dr. Ben Lynch: I am all about nutrigenomics and genetic testing but I am a natropath. I am a naturopathic physician. I do some woo-woo stuff. I am all about Dr. Stephen Senatra's Earthing Book.
- Dave: Me too. I used to sell Earthling stuff on the side.
- Dr. Ben Lynch: I think that it is so human, it is so... every living being is barefoot except us.
- Dave: I am barefoot right now.
- Dr. Ben Lynch: You got me beat. I am wearing socks, but you are not on grass are ya? You don't have grass on your feet.
- Dave: No, I do have an earthing mat under my desk and a sleeping induction mat, one of mine the spiky ones for acupressure but I am kind of a bit of a dork that way.
- Dr. Ben Lynch: You are the true bio-hacker, that is amazing, well done. We have to keep in mind if you do the 23andme MTFHR testing and you have the MTFHR defect and you have COMT you have all these other ones that is important to know. It is really important to know but don't get stuck on that and don't think that you need to take methyl-folate and 7.5 mg of Deplin because some doctors if you get diagnosed with MTFHR the first thing they do is they reach for the script and they give you 7.5 or 15 mg of Delpin and you don't-
- Dave: What is Deplin? I don't even know that stuff.
- Dr. Ben Lynch: Deplin is a pharmaceutical drug made by Merck, or Pan Lab in association with Merck I believe but it is 7.5 mg or 15 mg of methyl-folate. Now the RDA of folic acid is 400 micrograms. We are talking 15 mg and I have had clients in the past that they gave a couple of mg of a mg to their child broke car windows, broke house windows, beat up other kids. It can cause serious aggression it can cause palpation, heart attacks. It is very, very strong so ease into this stuff. It is very potent it is very, very powerful.



If you go to a doctor, they diagnose you with MTFHR, they write you a script for Deplin you say "whoa, whoa, whoa, whoa, let's try and lower dose first." IF they aren't receptive to that then I encourage you to just not fill that prescription and work up. You might need to 7.5 mg because you have folate receptor antibodies or there are other issues, your cell membranes are screwed up because your oils, you are not taking good oils.

Dave: There you go, bad oils will ruin good membranes fast.

Dr. Ben Lynch: Yeah.

Dave: I was wrong, do you know the half life of oils in cell membranes?

Dr. Ben Lynch: That is a great question, I don't.

Dave: I didn't either. This is part of the research for the Bulletproof diet book. By the way [BulletProofdietbook.com](http://BulletProofdietbook.com). Please pre-order if you like this podcast. Help is succeed. Anyway, I found this weird piece of research that was well-done. 600 days is the half-life of fatty acids in your cell membrane. Which means if you start eating healthy fats now, about 2 years from now half of your cell membranes will be built out of healthy fats instead of oxidized Omega-6 fats. It takes time to make that change.

Dr. Ben Lynch: And you have to be avoiding things, which damage the cell membranes at the same time.

Dave: It is something that is just not talked about but it is fundamental to life and it is an old analogy but the idea of a car. How do you make your car engine run a little bit faster? Well the air intake filter you change that. Add a turbo, add a super charger, increase the octane of your gas. All these little tweaks you can do. Your mitochondria have different pathways and you can do things like increasing ketones, brain octane oil can help you with that. The Bullet Proof diet can help you with that then you can do things like what we just discussed. Get the right form of folate instead of folic acid and look at how the performance of your actual energy

generation changes. When you get all these little tweaks down or some of them down you should feel better and like you were saying for cancer. If your mitochondria work your chances of getting cancer are lower. It is profound what is out there. It seems like we are just uncovering the surface and there is so much more we can do for anti-aging and just for feeling good.

Dr. Ben Lynch: I think too Dave, I think it is really important for people to know that fatty liver is on epidemic proportions right now. There is a formula if you Google "fatty liver calculations or Fatty liver mathematical model" there is a model now that is developed so physicians can diagnose fatty liver so if you have GGT. GTT should be order, so GGT, ALT, AST, these are markers of liver inflammation. If your liver is inflamed you basically are getting fatty liver and fatty liver- what is that?

Dave: I'm sorry I thought I heard a pause there. Should we just be calling that fruity liver instead of fatty liver due to the fact that fructose causes fatty liver or is that just me being alarmist?

Dr. Ben Lynch: No, no, fructose is definitely bad news. Fructose... I was thinking Fruity Pebbles or...

Dave: There you go.

Dr. Ben Lynch: I watched a lot of Flintstones when I was a kid.

Dave: I have had many a bowl of Fruity Pebbles and they are better than those Cocoa Pebbles they just are because of the colors I gotta give ya that.

Dr. Ben Lynch: But do they have those real blueberries?

Dave: Not like Batman Crunch.

Dr. Ben Lynch: What was that; like Adam saw that where he said "real blueberries" and they are just corn syrup and FDNC.

Dave: Oh, that is evil.

Dr. Ben Lynch: Anyway, but that comes in and the adenosine levels. No lab is really checking adenosine except for one or two. Adenosine is super, super important because if adenosine is elevated then that triggers hypoxic inducible factor gene, which then shifts your metabolism to lactate. You are shifting from an aerobic metabolism to lactate metabolism, which is what your cancer wants to run on.

Dave: I am actually training myself to have better cellular oxygenation. I spend an hour a day right now breathing through a Darth Vader tube that filters oxygen out of the air. I am going to be writing that up soon but it's remarkable.

Dr. Ben Lynch: Wow.

Dave: You got to monitor all these things if you really want to kick ass. These little tricks can somehow do things to small parts of your body that let your brain; at least in my case it lets me do things I couldn't do before.

Dr. Ben Lynch: What is that tube made out of though?

Dave: It is actually a high BPA Round-up infused plastic.

Dr. Ben Lynch: Perfect, that is good.

Dave: There is a question we are running up on the end of the podcast. There is a question that I have asked every guest on the show and it is given what you know, not just about your school of medicine but just your entire life's journey, the 3 most important pieces of learning that they have come across. Things that people should know, who people want to perform better. IF you want to kick more ass at life do these 3 things. What are they?

Dr. Ben Lynch: Laugh, breath...

Dave: I like that one and it made me laugh, so you got 2 out of 3 right there.

Dr. Ben Lynch: And uh... boy the 3rd one, you are limiting me man. Laugh, breath and I would say eat well. I think would be really important, of course there are a lot of other ones but you are limiting me 3 so. Eat well and we can talk about chewing but laughing is super important because if you are stressed out you are burning through your methylation faster because cortisol stimulates your methylation pathways faster so you are burning through it quicker.

If you are stressed out your up-regulating a pathway called kyuragin and then that can trigger immune escape so if you are stressed out you can not fight infections in your body. If you are stressed out you can't secret enzymes to absorb your food and digest your food and get the nutrients that you need.

If you are stressed out you can't sleep, if you are stressed out you can't have good relationships. If you are stressed out you can't love yourself or enjoy yourself and you turn to other things, which make you enjoy yourself and bear with yourself such as smoking and drinking and eating a lot of carbs. I think laughter and eating and breathing is super important because oxygen is so, so vital to us. Oxygen is what runs us. Oxygen and water and water is super important too, but we can combine that to eating right?

Dave: There you go. Good old carbon, hydrogen and oxygen.

Dr. Ben Lynch: Yeah.

Dave: Electrons, that is probably a whole other podcast on what electrons do. I know I write up on the end of this show but ozone therapy, which is all about electron donation has made a huge difference in my health and performance and I talk about that. Getting off topic again because we could talk about all kinds of cool stuff for probably 2 days. Would you tell listeners where they

can find more about you? Your seeking health site, how you like them to find you.

Dr. Ben Lynch: Okay, [Seekinghealth.org](http://Seekinghealth.org) is Seeking Health Educational Institute and that is an area of the general public and health professionals and I have a lot of information there. [Seekinghealth.org/gift](http://Seekinghealth.org/gift) will get you a video on folate metabolism, now it is nerdy and dorky but at the same time it will really educate and open your mind about what folate is. [Seekinghealth.com](http://Seekinghealth.com) is where my research goes into formulating specific nutrients and products for say prenatal care or supporting the mitochondria or what have you. Then so [seekinghealth.com](http://seekinghealth.com) is supplements. [Seekinghealth.org](http://Seekinghealth.org) is education and I keep them two completely separate entities. I don't mix. When I teach I teach, when I formulate I formulate and I give those products there.

Then MTFHR.net is a website that is all dedicated to MTFHR. There is a whole bunch of questions there, there are forums and so on that is totally free, but I think the best way for you to get your feet wet in this is to go to [seekinghealth.org/gift](http://seekinghealth.org/gift) and get that free video and give it to your doctor too. Your doctor will appreciate it and it is scientific it is grounded. All the slides will have research citations as well. I am not making stuff up in those videos.

Dave: You are doing a lot to help people and as someone who also does the research and formulates things its a sign that you are putting your money where your mouth is when you are willing to go out and invest the time and money and very substantial a lot of money it takes to create a supplement that meets the standards that you have identified so when people criticize it "well how can you talk about the science but also make a supplement?" How can you know the science and not make the supplement if there isn't something on the market that does that? I don't know how to live in a world like that.

Dr. Ben Lynch: You have to. You have to. You are doing a big disservice to the public if you find this great information and the market doesn't

have. You are doing a major dis-service to the population if you have that information and you are not making something out of it. Information is to empower you to do something with is.

Dave: Other than complain.

Dr. Ben Lynch: Other than complain, that is right.

Dave: Oh that note I will make sure after this to introduce you to my wife Dr. Lana because she is doing fertility consulting around the planet for women, specifically for women who are having problems like you mentioned earlier. They are having a hard time getting pregnant, repeated miscarriages. Using a lot of these tools sets but I didn't realize that you had some very specific connection after this so people can check that out and actually so you can check that out and she can check out your work and there may be some very interesting connections there.

Also, your next conference whenever it is, please let me know about it so I can put it on Facebook and people who hear this and are interested in it can have the opportunity to go and I really appreciate that opportunity to check that out. I want to dig more in on this.

Dr. Ben Lynch: Perfect. I will get you a backstage pass for free.

Dave: Awesome. Likewise, if you are going to come to the Bullet Proof conference in LA, September 26-28th let me know we will hook you up.

Dr. Ben Lynch: Awesome. Thanks Dave.

Dave: Thanks Ben. One of the things you can do to make your brain work really, really well is to remove toxins from your body. One of the most important antioxidants and toxin binding substances in the body is called glutathione. That is why I created [Upgraded Glutathione Force](#). Check it out. Upgraded Glutathione Force on [upgradedself.com](http://upgradedself.com).



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