# Ben Pakulski Interview with Daniel Reardon

*Welcome to the Muscle Expert podcast with Ben Pakulski, one of the world’s top professional bodybuilders – an expert on human performance and mindset mastery. Ben dives deep to deliver the strategy of top experts to upgrade your body, mind, muscle, strength, performance, biochemistry, and how to become the upgraded, modern man.*

*Join us on* [*www.benpakulski.com*](http://www.benpakulski.com) *to learn the cutting edge techniques to take control of your body, your brain, and create your greatest life!*

**BEN:** What’s up ladies and gents, welcome back! Muscle Expert podcast, I’m your host Ben Pakulski. We’re always digging deep into how to optimize your performance and how you can really hack your life, hack your body and become the best version of yourself. Today we’re going to dig deep on genetics. Everybody’s talking about epigenetics, everybody's talking about how you could influence them. So I’ve gone straight to the horse’s mouth, I’ve gone straight to the owner and creator of fitness genes – the guy who’s diving deep into 41 of your alleles and giving you exact specs on what they mean and how your body expresses them. We are also going to talk about how perhaps we can influence the expression of these genes and interactions these genes. Mr. Daniel Reardon, good friend of mine, how are you doing?

**DANIEL:** Good Ben. Thank you so much, and thanks for your intro.

**BEN:** I know you are doing awesome stuff and I had the awesome opportunity, probably almost 3 years ago now, to sit down with yourself and chat with some of your chief scientists, who are all the head researchers at, is it Oxford?

**DANIEL:** Yes, that’s correct.

**BEN:** So very blessed to be able to interact with yourself and your team, you guys are doing cool stuff. You’re actually the first ones to really bring the relevance of DNA to the equation. I think the fitness offices a lot of people are doing it now, but you guys have been doing it for a long time. And you are really trying to give people a tool to not just blindly go about achieving the fitness, but now kind of objectively look at how does my body work on the inside and how can I make the most of that? I've been digging around your site for the last couple of days, you got a lot of new stuff. It’s really insightful and really useful for helping us to use the catchphrase “hack our body.” We all want to know, should I be eating more fat? Should I be eating more card? Should I be trying more volume less volume? Which vitamins do I need? Which ones do I not need? How does my body work? And I know every one of my listeners is very curious. So can you tell us a little bit about how this came about for you? How this business became your brainchild?

**DANIEL:** I have always been interested in fitness and nutrition and as well as a medical school in fact. So I trained as a personal trainer and opened my personal trainer essentials. So as you worked as a personal trainer for about 5 years. So that business in 2004, which is when I graduated and then worked as a clinical doctor for nine years. Worked at various specialties (musculature medicine, orthopedics plastics etc.), but I stayed involved in fitness. I wrote a couple of books for we to publish in, and I was also at Muscle and Fitness magazine. I’ve always had an interest in extremes especially when it comes to kind of human suspense, human performance. I have always had an interest in the extreme, so bodybuilders have always fascinated me. People that can go to the extreme of building muscle, the extreme of losing body fat. And it just always make sense to me that, if you’re not really good at starting body building, then probably you could transition some of the information you might learn in that world into the rest of the world where these real issues at the moment with obesity and weight loss etc.

**BEN:** And now both good and bad unfortunately as we spoke about for a minute ago.

**DANIEL:** Absolutely good and bad. I remember you would always hear that someone's good at this or someone's stage or someone’s in a late sprint because of bad genetics. But there was never any context of that discussion. People might add limb lines and things like that. And I always used to say, “One day we’ll understand this, we’ll understands genes, we’ll understand how that relates to fitness and nutrition etc. I will tell you about 2011 at my best friend’s wedding. I and my best friend Stuart were talking about some genes that he and his partner had found to be quite prevalent in athletes.

And I remember saying this to him, “That’s really interesting. I’m pretty sure if I knew that information I could probably personalize plans even more.” And so we got to get some research and development and very focused on muscle lose fats. Then ultimately July 2013, in fact it was July 27, 2013, we launched. It was originally called muscle genes, which was the genetic test into the fitness industry. We never really looked back. The whole idea is that we’re focused on as a business and as a products is really understanding what information we can take from, looking at gene variations and how we can apply that to people's exercise or people’s nutritional or peoples use of nutrition supplements. In fact, general life. They can have a benefit through them to achieving their goals.

**BEN:** It seems you have two basic cohorts from my external perspective. Two basic cohorts that are going to be really interested in what's going on in their body. People that are sick and the people that are really trying to push levels of performance. So you're doing a really good job of isolating people who are trying to push levels of performance and giving us quantifiable data that allows us really look at and go, is this working for me or not. So one of the awesome things that I found when I first went through this DNA testing with your website fitness genes was, it was absolutely accurate and you speak about this a lot. It’s like, over 20 years of being a bodyguard at the point I was probably 15 years when I first took the test, I was pretty in tune with what worked well and what didn't work and there is this kind of innate ability to match what my body wanted to do. What you find a lot with people is, you know what you guys find in genes to be highly correlated with what they are already doing.

**DANIEL:** Absolutely. I would say that, when we look at our customers, our customers are almost on a normal distribution. The majority of our customers are people that perhaps aren’t in tune with their bodies. But then you get the extremes and when we look at athletes, I have worked with some of the biggest sports athletes in the US. However, when we looking at professional fitness competitors, the only reason they are professionals is because they have learned to be in tune with their bodies. They have learned to respond to things that work and things that don’t work or they have coaches that have been able to prescribe them something. Trying to Find a Specific diet principle that doesn't work. They aren’t agile enough to say, “Let’s not do this” The very nature a Professional is the fact that they have been able to learn by trial and error. Thus What You Have to Understand Is that the majority of people, the second they fail in their pursuit of a goal with regards to weight muscle building, the Second they fail, they stop. So ordinarily doesn’t work for these people. So you are absolutely right. For the professionals, they still lack correlation, which Is Amazing. But then here, we have to learn from that correlation to make sure that we drive them to the people that don’t see these correlations.

**BEN:** So you guys have been doing this for a long time. How do you immediately make correlations with a snip or a segment of DNA, which is known as a snip, to a particular aspect of somebody’s performance? Where does that correlations start to begin? Who’s making that correlation? Let’s start there.

**DANIEL:** The first thing is that, there’s basically 3 types of research. If you like to go into how we can develop products. As well as peer-reviewed research that already exists. In a sense the human genome was encoded. There has been a lot of research that is going on, where some studies have just anecdotally showed some pieces of Information that you kind of draw honest data. Their products are full. There’s other of the pieces of research that specifically look at certain elements of training on nutrition, related to snip variations.

There’s a lot peer-reviewed research that already exist. We have academic operations, so Fitness Genes currently works with quite a few fairly prestigious academic groups- Oxford University, Birmingham University, University College London. There’s a whole light we work, where we looking at a discovering new things. Then obviously within the data sets there’s a process of discovery that drives the new questions that we can ask. That we can entail to academic groups. So I would say that we’re never trying to answer massive questions like; we’re not looking to answer the question of what is the ideal plan for you because when it comes to exercise, there are so many elements and so many variables that become impossible to really assess. But When It Comes to questions like, is there a Specific behavior or is there a specific pattern of thinking that something has an effect on how they make the decisions of the foods they’re eating. Things like that. Well any questions that we cannot just start to get to the bottom to. So, we are now more focused on asking the smaller questions that we can actually get answers for. But actually these have the most profound effects on people's ability to stick to work out plans on nutrition plans. So the peer-reviewed discovery and our academic collaborations.

**BEN:** Interesting. So one such thing like, how broad of a Spectrum of snips are you guys looking at with respect to Performance? So, I'm not even going to start naming things off. I want you to kind of look at it.

**DANIEL:** So you know that this has been a company where we looking at, let’s say 41, gene variations of 41 snips. But we’re actually about to move on to a new system that is called the global screening, which is a new product that’s going to have a little more. We’re actually going to be looking at 750,000 snips. These 750,000 snips are actually the ones that most closely match the BayBank data on the Market. This will be the best and right products on the Market for relevance to say how fitness and nutrition and Lifestyle etc. these will be the best products on the market for probably the next 10 years. Of These 750,000 snips, 50,000 of them, we were actually able to contribute to Specific regions of DNA being looked at. Stuart spent countless hours really figuring out the snips that we really need to focus on for the types of things that we looked at as a company. So we contributed thousands and thousands of snips into these personalized 50,000 snips of the 750,000. When it comes to performance, we can break down performance because we can look at adaptations of training, the mentality being able to form effectively, we can look at performance based nutrition. There’s a certain number of kind of bucket that elements of performance fall into. What we’re looking for is all of the genomic information that can potentially feed into these buckets. So it might be that when you considering some of the ability to kind of cross the paint brush in their training work outs, it’s going to be combinations of focus, resilience to pain, resilience to fatigue, desire to win, there’s so many things we can look at.

**BEN:** So is there actually things, something that can be looked at genetically? I didn’t even realize that there would be something to be looked at. It’s like someone's ability to go beyond the pain barrier, can be traced back to be genetic pre-positions?

**DANIEL:** Absolutely. There’s so many things. If you start thinking about that sort of stuff, it ranges from everything to someone's ability to have a positive emotional response to exercise. And that might be to do with reward mechanisms why they believe cast cola means and how that can sort of take them past a certain point. Why is there actual ability to clear lack state and therefore, get a quick enough response that they can kind of go further beyond the lacteal threshold. These millions and millions of fit bars, there are millions. They are certainly a lot, a lot can be looked at there.

**BEN:** This is obviously leading directly into the conversation about epigenetics. I don't quite want to go there yet, but I love to go into the idea of how much can we influence the expression of these things. What I want to discuss is, is there a small cohort of snips that you find to have the greatest actual correlation with reality. Because I know a lot of them, there’s multiple interactions. So the application may be limited. Is it these specific 41 snips that you can say definitively like these are really valuable or is it even smaller than that? Because all of my listeners are listening saying, “this is awesome 41 is a very manageable number that's good, but is even that many that I should be looking at as being massive influences on my health fitness perception to fatigue and ability to become a better athlete.

**DANIEL:** It’s interesting because you could argue that and certainly how we’re building our models at the moment. It won’t necessarily that people are paying any attention to any single gene, because ultimately we looking at ultimately how lots of genes work together. Let’s say for example let’s just look at female cancer. So breasts when they are bearing cancer. When you look at some of the economics companies that do a really good job at the moment to understand the genome cancers. They are not looking at one gene that increases your susceptibility they are looking at 20 or 30 genes collectively how amass a particular effect. I think that's really where we are going and why we are transitioning now into the GSA because we’re looking at multiple genes and multiple gene variations that overall are exerting a particular effect. That being said, there is certainly some individual genes that we can look at and we can say these always tend to hold true. Then classic ones like the C118 gene which is the gene to do with caffeine metabolism. By and large almost always reflects what people agree to realize about themselves. I use myself as an example, I have always been somebody that I can go to Starbucks and I could grab a coffee drink it and within 15-20 minutes I’m pretty much so tired, I feel I must go to sleep. That’s somewhat certainly a result of having a pretty explosive response to the caffeine. So metabolizing it quickly, there’s as displacements of dopamine on the nervous system and hypothalamus. How certain things have its effect quickly and in that stimulating the whole release of ACTH and the pituitary and the adrenals cats’ calamine has been released, energy is up and then energy crushes. Whereas people that have slow metabolisms, you might talk to them and say, “How does coffee affect you?” and they say, “Doesn’t affect me.” If I have a coffee late in the afternoon, I can’t sleep at night. But I don’t ever get these energy specs. So it’s an example of a gene. The C118 gene is a really interesting gene because it’s not just caffeine metabolism, it’s yeast metabolism, even metabolism of things that got melatonin. How many people do you know that will say things like, “If I take melatonin I fall to sleep and I’m asleep all night.” Whereas other people would say, “But I’ve tried melatonin, I fall to sleep but two hours later I’m awake again.” It’s probably because it gets metabolized so quickly and just broken down. It’s another effect of this gene. There are certain genes where there is a direct sort of effect of the protein. Why it’s ultimately kind of doing it if you like. Therefore there is a series of recommendations that you can make as a results of that, obviously go dependence. There’s a bunch of genes that they’re whole true like that.

**BEN:** Fascinating stuff. So, when I first had my, at the time Muscle Genes now Fitness Genes, I had pretty much every gene possible for being a long-distance endurance athlete. Obviously I don't look like a long-distance endurance athlete. At what level is this stuff controlled by nature versus nurture, so we’re all looking at like, I have guys who come to me and they are 150 pounds and they want to be as big as you. Can they do it or is it the type of thing that if they may start young enough they doing training properly and maybe take some exogenous hormone manipulation or is it really the type of thing that, you tell me, because looking at myself, looking at my genes, if you would have shown me these genes when I was 15, I would be like, I chose the wrong sport. I better become a marathoner quick. Speak to that.

**DANIEL:** One of the things that we do is, we try not as much as possible to tell somebody that they can potentially be a long-distance runner or anything like that. What we really focused on is response to training. Let’s think about what do we know about muscle hypertrophy? There’s a whole load of things that we know about muscle hypertrophy. We know that time and detention is important, we know that oxygen is important, we know that lactate clearance is important, we know that tension is important. There’s a whole series of things that we know. If you are somebody that potentially could respond well to training, that would lead to an improvement of VO2max and oxygen utilization, one of the specific adaptations that would be valuable to someone who wants to get really big;

1. You store energy fat quite effectively. Storing energy as a bodybuilder is probably a good thing.
2. Having a good response to training to improve your B82max. Having a good B82max is probably a good thing for a bodybuilder. Having a good aerobic capacity again is probably a good thing for a bodybuilder.

In fact, diverting slightly, you and I before we went on that were saying how one of the changes that we see happening in bodybuilding is, has much importance placed on training and it's much will focused on other things. Actually when you look at the physic,

**BEN:** Don’t be on the road to say other things. You can say what we said. It’s becoming base culture.

**DANIEL:** If you go back historically I’m not saying that drugs weren’t used those years ago, but it was much more of training by sculpture. If you actually look at bodybuilders back then, they were doing cardio every day. They were working on their aerobic fitness that was giving them enough kind of lung capacity if you like, for lack of a better word, to be able to go to the gym, to train for 1 to 3 hours. You may talk about going to the woods and squatting for a day and stuff like that. If you are not fit, then you are not going to be able to achieve that. there’s so many first principles that your ability to be able to tend to be a good endurance athlete, on the basis that your nutrition is right and on the basis that your training is right, it stands to reason that could contribute to you being a good bodybuilder and being able to train effectively enough to build muscle. We’re goal specific and we’ll try and do it. We’ll try and hack your biology to help you meet your goal and simply understanding all of these outcomes of certain types of exercise activities.

**BEN:** Fascinating. I'm really wanting to go down this road of understanding. I have 41 snips in front of me and I really want to go down this road of discussing it. Because I think one, the listeners would be kind of interested to hear my snips and we wouldn’t go through all of them. But I would like to go through, the first one I am looking at here is, there’s a gene for endurance, of which I have two copies of the endurance allele. The ACE gene. Give me an idea. Give our listeners how they've come to the conclusion that that’s an endurance gene and how it works.

**DANIEL:** First of all, ACE stands for angiotensin-converting enzyme. The ACE gene is a gene that codes for protein that has an effect in the lungs entailing angiotensinogen and angiotensin 2 and an angiotensin 2 then has an effect on the kidneys and ultimately causes the kidneys to either reabsorb or not reabsorb water and salts through the endocrine system. So that’s actually what the specific protein does. However, and this is how it works with genes and snips, one of things that they discovered was when they’ve done big so called observational studies of endurance athletes, there’s an overrepresentation of this particular allele in this particular groups. So the second you start seeing that is the second where you have to start asking some questions. What else could this be?

Long story short, it turns out that the one of the effects of this gene is that for whatever reason it enables people to utilize oxygen a lot better. In the extremes of processes that that could be as a result of. If you can utilize oxygen better, what we are basically saying there is, that you have the capacity or the ability to get significant improvements in the B82max. Therefore, if you are someone you can push your B82max as far as possible, then you are somebody who is going to do much better in endurance activities. Be able to probably work out longer, doing things where the utilization of oxygen becomes more significant. For example, climbing. If you don't carry this particular gene variation, generally speaking, most people are not able to climb above a certain distance. Because they just can't utilize low concentrations of oxygen in the atmosphere. This is where it all starts, but then what happens then is you have all the research groups around the world start digging into more and more.

**BEN:** Gene for muscle strength. I have two copies in allele for the ACV R1B. How does that come about? What does it code for to begin with?

**DANIEL:** When you start thinking about muscle growth the popular sort of stuff in the last couple of years has been myostatin and philostatin and all that stuff, because they are negative regulators of skeletal muscle growth. But when you start looking at them, it is not just a little something that might start in or is activated. There’s all these things on the pathway and all these different genes or gene variations that are coded for proteins to activate pathways. You’ve got 881, this is one of the other genes that seems to have an effect, activates one of the other proteins on this pathway that will ultimately lead an expression or not. In humans, mysdata is not necessarily been found to be something that affects let’s say physique like in animals. So you know in animals, for example where animals is deficient in mysdata, you have ball heads which completed deficient etc. But hasn’t necessarily been found in humans, but that hasn't stopped people from actually having a focus on looking at the pathways because theoretically it should have an influence. This particular gene is gene that has been shown none massive studies, but has been shown that if you have some variations of it, you’re likely to show great improvements when you embark on formal strength training protocols as compared to people that don’t have some variations in It. What we are saying is that, some of these genes they are minor genes in terms of overall effects because this is an example of what WAP Is essentially cascading Pathway where it plays a part on the pathway, but there’s lots of others on that pathway that will ultimately steer for effects.

**BEN:** Since we are going down the path of multiple genes influencing hypertrophy, can you list a couple off and which ones have the greatest influence potentially on looking at hypertrophy and then I can look at what I have.

**DANIEL:** Yes, for example one of the interesting ones is the AC 10 3G Axon three. Axon three codes for a protein called Afractinin. Afractinin has a similar effect on fast switch muscle. So ultimately, long term, the main effects of that would be to do with recovery. So obviously if you get great recovery and fast switch muscle, the chances are, and I’m not saying that you can necessarily develop more fast-switch muscle but certainly that might be the potential that in a training session, you can lift heavier, you can lift longer potentially.

**BEN:** This is one thing that I saw across the board with professional bodybuilders and help people make the argument that it's chemically induced. But I see across the board 90% of the time they get such small amounts of muscle damage, even compared to me, I’ve got a heterozygous expression events, so I’ve got one allele and one not. I don't know these other people's DNA. I’ll say what, I’ve smashed some bodybuilders and then two days later they are fine whereas I be soar for five or six days. So I’m curious if that may be the reason.

**DANIEL:** It certainly could be. Muscle recovery is an interesting yet complicated topic. Ultimately, recovery is not an innate thing, it’s the overall balance of muscle protein synthesis process mostly protein breakdown and the likelihood is that a bodybuilder has either figured out the ways that they can maximize their recovery. Because the thing is, a bodybuilder relative to normal person, that’s still happening. It’s just for normal person that level of workout is going to drive their protein breakdown much higher than their ability to assimilate enough amino acids to fix the problems.

Then you risk all of the sort of rhabdomyolysis issues. I think that with bodybuilders they either learn to manage that process better by understanding what they need to do before, during and after. Or they are just genetically programed to just have a quicker recovery process and that might be through genes like the AC 10 3G. It might be through their ability to manage lactase. If you think of it like this, the harder you train, the more inflammatory signs can you potentially release and therefore, that’s going to drive to recovery process even greater as well. I think there’s a myriad of things that potentially would go into that particular discussion, but I do think you’re right.

**BEN:** Interesting. I know the biggest areas of interest for my listeners would be, as we spoke of it briefly the call, wanting to know how they should be eating. There are so many different schools and tribes around you should eat this way or that way, this is the best for you, this is the best for this person. But you’ve probably got the most scientifically validated way to say, this is actually the way you should eat based on what your body actually does with nutrients. Can you talk a little bit about that then we can dive into some of the snips?

**DANIEL:** Again, you and I said this before, that people’s eating habits are driven by the perception of whatever it is doing, without really understand everything they’re during it if you like. I think one of the things that we've definitely, definitely found is that dietary trends; most people never follow a dietary trend how it's meant to be followed. For example the number of people that come to me and say, “Daniel, I’ve been doing a keto diet and I’ve put weight on.” And actually when you look at what they’ve been doing, they’ve been having like 200g of fat a day, 200g of protein a day. But you do understand that the protein will preferentially be turned into carbohydrates and used before fats will be used.

So there’s so much misunderstanding, that generally speaking these complicated diets simply don’t get followed as they’re supposed to be. And in fact, most people would not have the ability to follow them anyway. So overall we find there’s this absolute mismatch of macronutrients and the vilification of carbohydrates and things like that. It just means that people are preprogrammed, to just never be able to develop a good, healthy relationship with food. You know, protein to most people is meat and protein shakes, so the diet is focused on meat and protein shakes. There’s just a whole lack of understanding about quality nutrition and the importance of the things that we’re supposed to put in our body.

From the onset, what we really tend to do, first of all we don't ever tell people they shouldn't do something. What we try to do is retarget and refocus people into thinking about other things that they should be incorporating. We’re big believers in plant-based proteins, but I would never tell someone that they shouldn't eat meat or fish. I will always tell people that they need to eat more plant-based products. And actually, I’ve directly stolen that from a good friend of mine, Darren Olien. Darren is a really well-known guy, a super-food hunter, but he is a vegan. One of the things Darren always says is just eat more plant-based proteins. That’s exactly what I do as well, is tell me to eat more plant-based protein. And almost always, that have massive beneficial effects on people.

**BEN:** That was going to be my next question: is that 100% of the time, or is there perhaps some DNA predisposition out there that says you should be a hunter-gatherer, you should be someone who is eating a lot of saturated fat and a lot of mean. I know if there is, it's a very small percentage of the population, but does not exist, or is it across the board 100% of the time more people should eat more vegetables?

**DANIEL:** When it comes to fats, obviously just consider saturated; the polyunsaturated fats you’ve got Omega 3’s and 6’s. Now, there are genes that we look at; the APO genes, the FTO genes, all of which gives an indication about fats that people should not avoid, and fats that people should think about reducing relative to other types of fats. So absolutely we look at that.

There are certain people we would say, you need to be consuming low of saturated fats and more of monounsaturated or Omega 3’s. There are other people where it probably doesn't matter all that much. the challenge when it comes to talking about fats is that the conversation can go in the wrong direction, because if you’ve got people who all of a sudden believe that they can consume saturated fats, what they don’t account for is the calories that that then adds into their diets. So it’s like, I can eat lots of saturated fats, yeah but you need to understand that for every gram that’s 9 calories, and that you’ve just consumed 100g for breakfast, saturated fats.

So again, this comes back to how we transition the message. I will say that overall, too many animal products are consumed. Too much saturated fat is consumed for most people. There is the argument that it has positive effects on my hormones like testosterone, that’s true but it’s one of many drivers of testosterone. So to think that you can just have a ton of saturated fat and enable that to happen, is not the case. But yes, there are certainly gene markers that we look out for.

**BEN:** Is there a gene that says I should or should not be eating high amounts of animal protein or just protein in general?

**DANIEL:** Yeah, and we can go down a really deep, dark hole there.

**BEN:** I’ll give you an example, I don’t digest certain proteins very well and I know a lot of people don't as well. I’m wondering if it’s something that they could just look at their DNA, their fitness genes, and say that’s either I do it, or just say I don’t have an abundance of hydrochloric acid or whatever.

**DANIEL:** I mean, there are people for example that have certain gene mutations, that means they can't metabolize branched amino acids. They can end up with accumulations of branched amino acids in the blood, which can cause a lot of problems. But when it comes to animal products, the LCT gene variation which enables humans to consume milk or lactose later in life, that was a gene mutation that came around and actually enabled humans to consume animal products. But I can't think of any specific gene variations that ever happens that would've enabled or made humans effective at the utilization of macronutrient in animal-based products.

That said, I’m sure as we discover more and more about genetics, we’ll start figuring out all these things. I think that specifically with digestion, it’s transitioning to less genome-focused and more microbiome-focused and biome-focused.

**BEN:** You briefly brought the APO A2 and A5 genes. Can you talk a little about how that works pathway-wise and obviously influencing your ability to digest saturated fat or similarly triglycerides?

**DANIEL:** Yeah. These two genes, their mechanisms are not fully understood. And again, these are stemming from observational studies, so the mechanisms are not completely understood how in particular this works. If you take the APO 5 gene for example, from observational studies, people that have consumed high amounts of polyunsaturated fats, for whatever reason have elevated levels of blood triglycerides. So when you reduce that polyunsaturated fat intake, or when you increase the ratio of omega 3 to omega 6, that always leads to a reduction in blood triglycerides.

What effect that has in terms of health and long-term effects, again is still a topic of investigation. But it is an observation where you can have a direct influence on reducing blood triglycerides just by knowing that simple fact.

With APO 2 genes, from observational studies again, people that have certain variations in the APO 2 gene who consume a lot saturated fats, are almost always fairly significantly heavier than people with the APO 2 gene who don’t consume saturated fats. And again what this leads to then, is it leads to the academic groups are able to start to go down very different paths to understand the reason for this.

Now, it might be that this is related to other gene variations and that it just happens that you find that people who have one also have the other, their selection mechanisms. In terms of understanding this pathways, they’re complex and again it's not just necessarily one thing that is happening on the pathway, it’s hundreds of things that happening on the pathway. It’s just picking up the bits that are important that you can actually give recommendations against.

**BEN:** How do I know that I'm a good carbohydrate or a bad carbohydrate or poor carbohydrate metabolizer?

**DANIEL:** Again, there’s a number of genes that we look at. There is one interesting gene that we look at, we look at a number of PPO genes. So, one of the genes (PPO alpha), is a gene that has been shown to have an association to have effectively or efficiently you switch from being able to burn carbohydrates to being able to burn fats. Obviously if you're someone that can effectively switch, then carbohydrate consumption as long as it’s not making calories too high is probably not going to be that detrimental in your ability to lose body fats.

But whereas if you don’t switch effectively and you always have an abundance of energy from carbohydrates and can’t efficiently deep into your fat stores, if you don’t manipulate things like the carbohydrates or macronutrients, you’re going to find it difficult to actually drive any fat oxidation and physique change. So that’s one example of a gene, but that’s more of a utilization thing.

Other genes that are more interesting with regards to insulin sensitivity; these weren’t the prime reasons for our interest but we do happen to know that genes like the PGC Y-alpha genes and some of the beta adulating receptor-related genes, all have some sort of influence on how sensitive cells might be to insulin, which obviously then has an effect on not so much carbohydrate metabolism but more actually what the endpoints of this circulating glucose might be.

**BEN:** So for the PPO Alpha snip, I have double G, so I have two fat-burning alleles. So give people a practical example of how that would influence my nutrition.

**DANIEL:** Again, it depends on your goal, but let’s say for argument’s sake that your goal was to put some muscle and lose body fat. I would be making sure that your diet is as a ration not less than 40% carbohydrates, and maybe even slightly more depending on what happens on the course of time, because you can effectively use carbohydrates. It is not going to affect your body’s ability to burn body fat, and more importantly we know that people who do consume carbohydrates generally have an easier time building muscle. I know there’s going to be people out there that will disagree with that.

**BEN:** They can disagree with whatever they want, but that is reality.

**DANIEL:** Yeah, the reality is the way you can affect these carbohydrates, the consumption of carbohydrates in your diet, a good amount in each meal, it just really beneficial effects in building muscle. So for you, even in the dieting process I would be making sure you aren’t just crash lowering carbohydrates. I’d either want to see a gradual overall calorie reduction, so that ratios are principally staying the same. Or if you do start to hit any periods where body fat wasn’t dropping fast enough, then maybe you might do some minor manipulation of the macronutrient ratios, but just nothing too crazy.

**BEN:** Man, I wish I had this information 10 years ago to be honest, because there are those times that I are crashed my carbohydrate levels and I absolutely saw a decrease in performance and I absolutely did not see an increase in my body composition. So when I look at these things and I know what they mean, I smile. I saw that definitively, I saw the exact things that you speak of. It’s very, very fascinating. So for the listeners out there, this is useful stuff. PRG 2C is a risk of health when obese, explain that.

**DANIEL:** With a lot of these genes, there’s multiple versions of the genes. And the significance relevance of them, some of these genes are merely a calculation points, and the phenotypic effects might not be that significant. Really this is not to do with, when people are overweight (because obviously we have to consider when people are overweight what the genes mean), this is one of the genes that some variations there seems to be a correlation between people being overweight and not necessarily experiences in the lifestyle-related illnesses if you like; of diabetes, high blood pressure and others specific disease-related factors that other people with this generation also quite seem to experienced.

What the significance of that is, I don’t know. What I will say is that the medical world is learning more and more about insulin-related issues; that insulin-related issues is not just diabetes. We’re seeing it in PCRS, in Alzheimer's and loads and loads of other diseases where an understanding of insulin sensitivity and resistance and those sorts of things is going to be crucial to how we manage these conditions long-term. What we are doing is that we are kind of making sure that we pick up things along the way, and this is an example of where we’ve picked us something along the way.

**BEN:** So the next genes that pop up in my test, and not that everyone cares about my tests but I think it’s a really interesting way to look at it and learn: SSPG-1 excessive, like I’ve got to split AG. SSPG-2 I’ve got CC and testosterone, I’ve got very high. So as we spoke about before the call, I'm pretty transparent about the fact that I was obviously a professional bodybuilder using enhancement at the time, and I would go off every year for four months. And I would never usually use any PCT, and people are like, “What’s the matter with you?” I just never felt any worse. Did my body composition get worse? Absolutely. But I also went from training 10 times a week pre-contest to training four times a week post-contest. But I always say I never felt any worse. It kind of explains it right here, right?

**DANIEL:** Absolutely. We think we understand testosterone, and the reality is we don’t. Personally, I think testosterone is just a miracle hormone. I’ve been fascinated with testosterone for I would say a good portion of my adult life, because I’ve seen so much in medicine where they’ve tried to use testosterone therapeutically, in sports, and in bodybuilding and things like that. One of the things that we decided to look at a few years back was actually the genetics of testosterone, and really try to understand it.

So we created a scoring system based on multiple gene variations, where we looking at several metabolic globulins, we were looking at what we known about free testosterone, the estrogen receptors, and all that stuff, to ultimately lead to a score. It’s one of those things that’s so much predictable, where you can kind of get to know certain people and you just automatically know they’re probably going to be so high on this. You also get a feeling for the men who have this super-high testosterone and the men that don’t. And the high and very high, you kind of look at it and it’s great. But it’s actually significant when you start getting to the mediums and the lows, because it’s quite rare, we don’t see it very often.

I always talk about this story: it was three or four years ago, and there was a young guy of early twenties. And this is just after we released his testosterone score. He got in touch with me, and he said, “Dan, I do want to be tested, that’s actually fascinating, but I was really interested to read about my testosterone score being medium.” To be honest, he was the first young guy, early twenties, who I had met so far of our customers, who had come back with a large score, because even accounting for age and environment factors, it just wasn’t common. So I was like, let’s go on a call to talk about this.

So we got on a call and we’re talking about it, and I went through the typical questions you might ask someone when you start to think about testosterone: the ability to lose body fat, strength, ability to gain muscle, libido, how you feel, the things you think about, emotions, and all these sorts of things. And he was classically someone who you would describe as probably having issues with testosterone, probably low. So I said, “Why don’t you go to doctor and just get your testosterone levels checked, because my understanding of this is that it may be something you do need to actually think about.”

So he went to his doctor, had his testosterone levels checked, and they were like right at the moment! I don’t remember the numbers, it was like 100 or 200. And he came back and said he’d been checked and the doctors don’t want to do anything. I said, “That’s right, it’s probably a good idea not to do anything by the moment.” Long story short, I helped him lose his body fat and start to get his diet right and incorporate much more intense training. Anyway, his testosterone levels peaked to about 250-280, but that was enough for him to start to see some changes. You know, it’s never going to be so high, but at least he wasn’t experiencing some of the things he was experiencing before.

Again, as a tool for people to start really getting interested in their own biology, and ultimately he could've ended up with all sorts of issues long-term, because his body fat would never have come down and there were potential fertility issues and all those sorts of things. But because at that age he just picked that little finger and he was able to start thinking about it, maybe in his late twenties he’ll have to do some HCG or whatever, but it was really cool to pick it up.

**BEN:** So can you talk some of the intervention strategies that you use? Obviously training heavy, getting some body fat off, some diel manipulations.

**DANIEL:** So for him, it was actually looking at everything from the second he wakes up in the morning to the second he goes to bed. So the first thing he does in the morning is simple little things like making sure his gut health is alright, have some glutamine in the mornings and things like that. Some zinc in the morning, vitamin D3, doing high-intensity workouts. And this is not really considering fat here, it is just considering the things that we know are right. Breakfast if always a high-protein, medium fats and slightly low in carbohydrates. What we know about protein is that it has an effect on hunger, so if you eat more protein early in the day you’re less hungry throughout the day. So it’s just flipping his mentality from snacking on the wrong types of foods, and also trying to stimulate a bit of an aggression in his mind. Then also half a pineapple early in the day, because of the effects that has on increasing protein digestion.

Nothing mid-morning. Moderate protein lunch, moderate carbs, slightly high fats. With him, we were doing slightly more saturated fats. He didn’t have any of the APO gene variation, so we were doing more saturated fats. But it was in a lower calorie meal, generally a lower calorie mean with more saturated fats.

Then training, doing a heavy weight training session, much more strength and power focus midafternoon. And then also regime at night to make sure he turns off his phone and adds fruit and goes to bed. Making sure that he’s taken magnesium before he goes to sleep and all that. So there’s a whole regime before going to bed. And then making sure he was getting at least seven hours of sleep. Then same again and just repeating.

Now, calorie-wise, I think he was on less than 2,000 calories a day. He’s a reasonably heavy guy, so he wasn’t on a lot of calories. and this was really just trying to drive three things: one, fat loss as quick as possible; two, that he was getting into the mentality of lifting heavy and understanding what high-intensity training was; and three, that he was starting to build in his own mind that is he wanted to fix this problem he was going to have to be fairly driven in his approach – so he was going to have to follow a strict diet and training principle. Ordinarily we’re not strict on people, but it's like this is going to take a bit of change.

He lost a reasonable amount of body fat, but he wasn’t too crazy. He was actually able to workout and follow the diet. And then over the course of 6 months, 8 months, 12 months, we managed to get this slight shift – but it took ages.

**BEN:** The exclusive reason I wanted you to go down that all loophole and talk about that, it was just the understanding that you made an influence on somebody’s testosterone levels with training, environmental changes and sleep. All my listeners need to know that, and I think most of them do. A lot of people are trying to buy testosterone replacement and asking how they can hack their testosterone, you gave the answer. There is no magic pill. Get leaner step one, lift heavy weights, have more sex and eat some meat.

**DANIEL:** Yeah. One of the things I also said to him was, he was doing four significant lifting sessions a week, and I said, either have sex or masturbate before going to the gym, because that has been shown it’s the way you get peaks and luteinizing hormones midway through the session that potentially drives it. The other thing I said to him, I’m not saying you should drink alcohol, but when you drink, after you’ve drunk you get a spike in testosterone. So if you’re going to go out drinking that’s fine, but make sure when you get up in the morning you don’t do a heavy lifting session. Little things like that. The thing is, no single thing is going to can have an effect, but when you tell people lots of little things…

**BEN:** You just rationalized my bottle of wine tonight!

**DANIEL:** Exactly! Just make sure you lift in the morning!

**BEN:** Yeah, 6AM I will be out here reeking of alcohol coming out of my sweat. So I’m very curious about the future of fitness use, I know you’re working really hard, I know you’re eagerly trying to build something massive. I have a few questions I want to ask about the future, but why don’t you tell me what the future holds. My biggest question is, is there going to be an epigenetic component to what you’re doing; like teach people how to influence these genes. Like, the MTHRF gene, if you have this you need to take this – is that even legally possible for you to make those recommendations? And if so, how far away are we from that?

**DANIEL:** I mean we do it now. The question about MTRHF gene is, what do you want to achieve from it? There’s something called the heterozygous advantage. If you look at the MTRHF gene as an example, the long-term action of expression of this gene is that it switches off DNA. So either promote skeletal muscle repair or escalate skeletal muscle repair, and obviously you want a balance of this because you don’t want unregulated growth because that also leads to issues.

But one thing they found is that there was potentially an advantage to having one copy of each of the alleles, which drives this process. Because it’s likely that there is more on the skeletal muscle repair site, that could have potentially competitive advantages for athletes. However, you don't necessarily want that, because there's the risk of a lot of driving homocysteine in the blood, and that long-term might have some cardiovascular risk factors. The thing is, in all of this, it’s a balance of understanding what is the long-term outcomes and the short-term goals and stuff like that.

But there are things you can tell people now, I mean, the MTRHF you can talk about methylated folic, methylated B12, in fact nay methylated product. So even the use of creatine and B10, these are all things that potentially methylate and can drive things into the methylene pathway. So there’s a lot of stuff that you can do there.

Are we ever going to get focused on gene expression and epigenetics? Well, it's not that important for us because all of us are focused on snip variation. So any research we do, anything we know, is all focused on that. And what we have to look at is the long-term outcomes and the changes made as a result of understanding snip variations. And to be honest, if we started looking at RNAs and transcribed proteins and things like that, I mean, that’s analysis and then it gets more complex. But our focus is really in snip, and understanding long-term what the snip and the combinations of the snip, relative to the combination of other environmental factors and other pieces of biometric data.

**BEN:** Well, that’s the question. You guys are doing all these studies on these snips, and people go, Okay, this is just what I've got, But we know we can influence them, expression and otherwise. Where do they go to find out the greatest resource on how to influence? Let’s say I know that I've got some genetic disadvantage or potentially a disadvantage that we maybe definitively know can be influenced, is there a resource out there? If you guys aren’t going to be a resource, where do you recommend people start looking?

**DANIEL:** In terms of the actions as a result of variations, we’ve got a team actually that are working on that consistently. So I think we are ultimately the resource, to do this and look at this, etc. I think the other thing also that we’re balancing into this is also a real understanding of the people and actually what is reasonable to expect people to be able to do? From my perspective, what we don’t want to do is come up with all of these great ideas that no one actually implements.

**BEN:** You guys just need to hire me to be the guy that says, “Shut the fuck up, stop making excuses! Upgrade your standards!” Right?

**DANIEL:** Exactly. You’re absolutely right. In fact, I think a combination of you and Nick Mitchell would be quite effective!

**BEN:** Yeah, ultimately. The world is so conformed to mediocrity that it's disturbing. It just needs to be an approach of like, no we’re not going to change one thing, we’re not going to change small things, change fucking everything! Change it now and change your life! And stop being a pussy! In reality, everyone’s like, “Oh, I’m not happy with this.” Well, so change it! Right?

**DANIEL:** Yeah.

**BEN:** You’re taking the political approach, like we’re not sure that people are actually going to apply this, at least putting together the most ideal plan and if they follow 30% of it they are better off than they were before, right?

**DANIEL:** Exactly. Let me tell you another interesting story because it kind of relates to this. There was a lady, I worked with her on everything she needs to do, and she said, “Dan, I just don’t understand.” I gave her a nutrition plan, gave her all of the genetic information – everything laid out really clearly, and she said she didn’t understand. I said, “Fine, so send me a picture of what you’re eating now.”

And she sent me a picture of the plate of the food she was eating, and there were things on her plate, and overall it was pretty bad. So I said to her, “Okay, listen. Remove three things from your plate and replace it with some green vegetables: some broccoli, spinach – whatever you want, just replace it.” She said, “Is that it? It’s as simple as that?” And I was like, “It is, it is as simple as that.” A week later, she sent me pictures of the foods we recommend for her and the whole family to eat.

The reason I say that is understanding what people consume. If we can understand what people consume and how they can consume it, then we can make 100% of people get incredible results. But without understanding that, it is only 5-10%, and that is not good enough. We have to be better. You know, I am spending a lot of time at the moment really trying to understand and answer these questions.

**BEN:** I think you’re doing awesome stuff, I’m very grateful. If people want to pick up their DNA testing kit, is that something that you guys handle A to Z or do they have to go to an external testing facility? Can you explain the process?

**DANIEL:** Yeah, sure. They go to our website [www.fitnessgenes.com](http://www.fitnessgenes.com) and head over to the shop, then they can purchase our DNA testing kit there.

There is one more quick story. A couple of years back when we first met, there was a customer of one of your followers (following the MI40 program) called Kennan Stages. Kennan’s a veterinarian from Texas, and he did the muscle genes test and got results. Ultimately over the last few years, he’s followed the stuff that we set for him nutrition-wise and training-wise. He has continued to do his MI40 training and some of your other progression products. I actually met up with Kennan for the first time a couple weeks ago, and we did a workout together, going to the gym in Venice Beach. Ultimately we did an interview where we were talking about how we met through you, and he follows the MI40, and stuff like that.

Going back to this thing of understanding how we can help people achieve their goals, one of the greatest support to people achieving their goals is when they see great people like you actually talking to companies like us, where we can actually all start putting our heads together and figuring out the answers to these questions. And Kennan’s an example of someone who has really benefited from actually being able to understand that you and I know each other and respect each other’s philosophies when it comes to fitness and nutrition. And by him following that, he’s been able to get great results as well.

**BEN:** I think we may be one of the very few people that actually look into that. We have an elite coaching program called Project Milo that I partner with Cason Hanson, and we do that for all of our coaching clients at least to give us some type of data. It allows us to objectively look and say, “okay, let's start here.” It gives us a jumping off point. It isn't always the end-all and be-all, we don’t exclusively use it, but it’s definitely giving us a jumping off point to say they may need more of this and a little less of this.

You know, we’re trying to get as much data as we can, and create our own database of like with this person we saw this. We’re trying to create correlations. And we know very little, we’re always after you guys, we’re always learning and this is half the reason why our conversations are so valuable; it’s because it allows us to ties some of the loose ends.

**DANIEL:** Amazing!

**BEN:** Thank you very much sir, I appreciate it! All you guys get out there and get your fitness genes test done, honestly a massive, massive help. Daniel also gives you a bunch of training and nutrition plans, action blueprints, and a bunch of other amazing resources on the site [www.fitnessgenes.com](http://www.fitnessgenes.com). Thank you Mr. Daniel Reardon.

**DANIEL:** Thanks Ben!