

## Paleo Solution - 222

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Robb Wolf:

Hi folks. This is Robb Wolf back with the Paleo Solution podcast. Today it is a huge honor to have Dr. John Ratey. He is an assistant – doc your bona fides just dropped off of my screen here, here we go-- assistant clinical professor of psychiatry at Harvard Medical School. Of particular note for folks in paleo land Dr. Ratey wrote the bestselling novel Spark that was out in 2008. We also have Richard Manning who is also very well known in the paleo and ancestral health scene. He wrote the book against the grain. Gentleman, how are you all doing?

Dr. John Ratey:

Doing great.

Richard Manning:

I'm good.

Robb Wolf:

Fantastic. I was jabbering with these guys a bit before we rolled just mentioning that each of them individually I could probably do about three or four hours of podcasting and the fact that I have both of you on somehow I need to compress that into 45 minutes to an hour so I'm not entirely sure how we do that, but we'll do our best effort on it.

Dr. John Ratey:

Great. Let's do it. Let's roll.

Robb Wolf:

Doc, could you give folks a little bit of your background? I find it fascinating that you come from you know, possibly one of the most august schools of medicine in the world and you know, clinical psychiatry oftentimes is a very – as much as possible a very cut and dried kind of clinical experience but yet you've become intimately involved in the –you know, evolutionary biology and exercise as it applies to bring health. I find that kind of fascinating like how did that process occur?

Dr. John Ratey:

Well it's been a lifelong process. So I started off playing as much sport as I could growing up because that was the ticket out of my neighborhood, the ticket to ride to go to college was to get an athletic scholarship and I did. But I played everything and I was always moving, always recognizing that I needed to be moving or there would be trouble. When I came to Boston for the rest of my life 40 years ago or so, I came in the midst of the marathon revolution if you will with Bill Rogers and everybody was running. So that became part of my DNA as well. But I was really aware of what happened when you stopped running and that people get depressed. They came to me with complaints of attention deficit disorder

as adults and I began to really focus it on exercise as a medical treatment or psychiatric treatment, psychological treatment and all of those. Then I got addicted to the brain many years ago now and he wrote a book called The User's Guide to the Brain. But in that and other books, we've always talked about exercises being a treatment and then learned about this school in 2003 in Naperville Illinois and sat down and wrote Spark from a thousand clinical papers, scientific papers to try to distill it and put it in plain language which is what I do.

Then it carried forward into meeting people like Richard (Dick) and we hit it off great and talking and then learning more about his life and as we like to say it, it was the meeting of the mountain man and the shrink you know.

Robb Wolf:

[Laughs] Well Richard give some folks your background and you know I have to say and this isn't internet glad handing because they have you on the show. Both of your books are literally some of my favorite and most referenced and recommended books. Richard your book Against the Grain: How Agriculture has Hijacked Civilization, you really encapsulated so much of the story that I have tried to tell the people when they look around at our society and they try to figure out why are people so sick and broken and different kind of dysfunctions that we have going on. You know, where we quarterly created for this environment and it kind of seems like you know, the environment that we were manifest for is quite a bit different than we live. Give folks your background and how you came to write that book?

**[0:05:08]**

Richard Manning:

Oh yeah absolutely and I'm glad the book is just doing useful and that's a great thing for a journalist to hear. I mean I try to make my writing useful in some way. but I am a lifelong journalist and I've just been chasing stories for 30/40 years now with a skinny notebook trying to figure out ultimately where those stories lead. The path for me has really lead through agriculture and some interesting ways. I mean I started out writing about standard environmental issues like I think about the environment a lot just because I happen to live in Montana. Because of that, that ultimately led me to agriculture and how agriculture has really compromised the ecosystems around the world. But as I looked into that and I saw parallels with humans and that and it started me thinking of humans, an individual human as an ecosystem. That an extension of the destruction of ecosystems by agriculture has been a destruction of that human ecosystem at the same time or at least a severe compromise of it.

At the same time, my work has been really informed from the very beginning by wilderness. I love in wilderness so I spend time in wilderness a lot and I think about that not only as a place to get away that people think about wild places for doing that but also in terms of productivity. That especially native prairie was far more productive before we started farming it and the extension of that is our body if we're better before we started feeding those domesticated food. So and that really got me thinking along that line of wild versus domestic and that's what we finally came to and that was part of the conversation. This really has been a wonderful conversation between John and I leading up with that book, bouncing off those things that he talked about earlier and what I'm talking about bringing those together and seeing what kind of sparks we can generate with those two ideas.

Robb Wolf: That's fantastic. So the forthcoming book is called Go Wild: Free Your Body and Mind from the Afflictions of Civilization. You folks coauthored it. Dr. David Perlmutter did the foreword so I have a feeling that this book is going to do rather well. Great bona fides on the front end of that. You know, what was maybe the spark or the seed crystal for collaboration on this?

Dr. John Ratey: Well I think just meeting each other and talking and getting to know each other at the conference is now it seems like a long time ago. But we kept in touch and both of us were trying to think about how we can bring another message out there to the people about the demise of so much of what we have seen around us, the people, the obesity crisis around the world, sleep deprivation around the world, all the stuff that we've talked about and that we know. His Against the Grain was a great turn on for me and I think he was turned on with Spark. So that was the beginning of and led to our collaboration.

Richard Manning: Yeah very much so and it was a conversation and those things came together in ways that we almost didn't expect. Like it turned out to be quite illuminating. And at the same time, both John and I during the process of doing this book experimented with ourselves. I mean we made changes in our own lives based on what we were learning and I made changes based on what I learned in Spark for instance. As those things started to pay off and we started to learn things, it gave us more confidence that our conversation was headed someplace pretty good, pretty interesting.

Robb Wolf: Could you guy share some of the self-experimentation that went on and kind of the results?

Dr. John Ratey: Well most of my colleagues you know, who stay up with things or on a low carb diet more or less but when I got with Richard and we started doing the research and reading for this book. Then I met a woman up in Richard's hometown up in Alpena, Michigan and I met her husband that was telling me about her transformation with the paleo diet. She had been really, really sick and so forth and so on and by starting on this diet, she really had a big change. Well that led me away from not just the low carb but to try to get really, really as low carb as I could and in this unwild society that we're in, and especially traveling through airports, boy is that hard.

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But it really made a big difference. Now it's been almost two years and most of the time I'm pretty much paleo in terms of the diet. I have been exercising most every day but as we learn things I've added more time outside exercising than inside and so forth so.

Robb Wolf: You know, for both of you guys, one of the kind of hot button topics that we find in paleo land is higher carb versus lower carb, just how low carb like you know, ketogenic versus 100, 150 grams of carbs a day. Like where have you guys kind of played on that? I've been all over the place like I came into this much lower carb actually leaning more towards a ketogenic approach or maybe a cyclic ketogenic approach, which I felt maybe emulated, kind of an ancestral eating pattern pretty closely. Some folks like Stephan Guyenet and other people have made a pretty convincing argument that maybe you know, some unrefined but consistent carbohydrate sources maybe played more of a consistent role in our diet in the past you know, like some duplicity of amylase genes showing some adaptation for quite a number of people, even hunter/gatherers having quite a bit more amylase activity than say like chimpanzees interestingly. Like what do you guys think about like the kind of relative carbohydrate load?

I'm definitely of the opinion and Dr. Perlmutter and I talked about this quite a bit. If we start seeing clinical or lab manifestation of disease states like some sort of inflammation or I like to call it brainflammation if we see particular issues in the brain. Then clearly dropping carbohydrate level is a great therapeutic invention. But you know, if somebody is eating unrefined "paleo" carbohydrates or exercising regularly, they go to bed when the sun goes down, they get up when the sun gets up but what do you guys think about that story?

Richard Manning: Now I think there's a lot of variation and so we deal with this in the book as well we can't give advice for every person in every case and where you ought to find that line. But you do have to find it and you'll find it and it's

just going to vary with individual. Now personally though my experiment and my personal experience was I went ketogenic. I went ketogenic because I was running long distances and it's like okay I'm picking my mileage to ultra-marathon distances. I was taking the traditional advice about I'm going to eat the sugar gel three hours out and so forth. I was having terrible problems. So when I eventually went ketogenic and was able to run four or five hours without eating food at all, then I knew I was on the right track. That's kind of an example of the way that I advice people to go is that you're going to have to find your own track but I found mine and it was kind of a fun process. It's probably going to vary over time.

Robb Wolf: Sure.

Dr. John Ratey: For me it's the first – after the first six weeks on the paleo diet and I lost ten pounds that I didn't think I needed to lose but that was probably the mental fat, the internal fat in our bodies. I felt great and well my wife is a little concerned at times because I would get my weight so far down but she would say come on, you've got to eat some carbs. [Laughs] I want something to hang on to.

Robb Wolf: Right.

Dr. John Ratey: You know?

Robb Wolf: Great.

Dr. John Ratey: So every now and then I've splurged but I found that I just didn't miss it after six months or so and you know, I like my wine and occasional sweets but they're very occasional. But still and then traveling you really can't be all paleo. I mean there's no way going through airports for hours that you can avoid having a carbohydrate rush you know so --

Robb Wolf: It gets very, very difficult. I've spent a lot of time on the road as well and it definitely gets very challenging. You know, my challenge with figuring out a good air fuel mixture is that the sport that I do, Brazilian jujitsu is very kind of glycogen demanding. So it's a five to ten minute rounds. You know, most of the folks that I've seen that really see a good performance booster they're definitely more – Richard it seems like doing more stuff along the lines that you're doing. Marathoning, ultra marathoning very, very long distances. It seems like the further the time indexing goes out the greater the kind of benefit of a fat adapted ketogenic athlete goes.

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And then as we start getting something that looks like an 800- meter runner or maybe a wrestler then you know, clearly an anti-inflammatory paleo type diet seems to be great but those folks still seem to need to get in some carbs because of the nature of their activity. Have you guys played with that at all or have you worked with other folks or you know, is that an overly leading question to figure out what your thoughts are on it?

Richard Manning: Not really. As I mean it's not an overly leading question. We thought about it quite a bit and one of the factors we haven't talked about in this but I think it does bear on it quite heavily as the level of insulin resistance occurs, these build up over time.

Robb Wolf: Uh-hum.

Richard Manning: And I think that's going to be a big deal and a lot of people who have a lot of insulin resistance is going to have to be complete Nazis about it just to overcome that insulin resistance. Or if you're lucky enough you don't have that then you could probably play around carbs a lot more than anyone else. Also exactly what you suggested. I mean by the way you must be a pretty tough guy to do Brazilian jujitsu. That's a demanding sport.

Robb Wolf: It's old dude division and I consistently get the crap beat out of me so I'm –[Laughs] I end up on the bottom of the tussle but for some darned reason I gravitated towards that versus other stuff. So every day I finish with that. I kind of ask myself why didn't I get into golf or something you know, different than this right? Yeah, yeah.

Dr. John Ratey: Well I've been ketogenic a few times for a period of time and it is really quite – it's an eye opener for sure. I was very surprised about how much energy I felt and so but it's really hard to keep it there and living in the world we live in it's hard for me to get grass-fed meat really wild fish, really wild caught fish. I mean it's just more difficult than ever before because everything is so processed and corn-fed. So but I think that you will go up and down on it. I think that it's really hard to be the Nazi. But it's worth trying. It's worth --

Robb Wolf: Absolutely yeah. I joke in my book that you know, usually in college people do at least three to six months of hookers and cocaine and pizza and it doesn't kill them so it doesn't seem totally crazy that you know, a 30-day intervention of a paleo diet is going to kill you all. It might actually save your life so it seems like a pretty reasonable thing to suggest to people.

Richard Manning: And that's one of the points we get to in the book is that the humans are really evolved for a lot of variability. I mean we face a lot of different demands through evolution and we've dealt with those demands better than almost any other species could. I think that's part of our success. So what we're talking about here especially in terms of getting your diet right is kind of doing the solid base that makes you able to deal with that variability that you were just talking about and may have set that's the yin-yang of this whole argument. That you build that solid base on some core issues like getting carbs right, like getting your sleep right and even like getting your relationships right.

Robb Wolf: Uh-hum.

Richard Manning: And then you can deal with that adversity and in fact you're better off to face that adversity after.

Robb Wolf: I guess you know, straight out Naseem Taleb's work with Anti-fragility and the resilience and whatnot.

Richard Manning: Absolutely so yes, yes. Yeah and he believes in fasting as a matter of fact and in fact that's something we haven't talked about but it's certainly it must have come to bear on human in evolutionary time.

Robb Wolf: Yeah, yeah. I wrote an article on intermittent fasting back in I think 2004-2005 and the interesting thing that I found with that was that the folks who were willing to give intermittent fasting a shot were the same folks that would do three crossfit workouts a day, eat absolutely no carbs, you know, it was only the kind of type A overachiever folks. And what I kind of found was that our more type B people, you know, maybe a computer programmer who's pretty sedentary you know, making their last meal happen at say 5:00 p.m. not eating again until noon or something the following day. You know, a good 18-hour plus block would be great for that person. But I found that the main people doing it were like overachieving, police, military and fire fighters who were already just burning the candle at both ends.

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So I actually kind of pulled back the messaging on that a little bit just because the only people that I seem to get to try it, it was sometimes the straw that broke the camel's back. but I absolutely agree clearly that was something that was kind of woven into our DNA is these periods of cellular autophagy and unpacking these broken proteins in our cells and mitochondria and cleaning all that up. It's been interesting for me to figure out how to get some messaging out there so that the right people

kind of play with that technology and then the people who are already pushing themselves to the absolute breaking point that they don't add something extra. Have you guys played with any of that stuff or seen any of that?

Dr. John Ratey: Yes. I have a group once a month with a bunch of neuroscience geeks. We get together and we had a person in talking about intermittent fasting and its effect on the brain and the body. He was doing all this experiment with rats and mice and but also with humans. We learned about it and then one of the psychiatrists, psychoanalysts in the group had began to start intermittent fasting daily, I mean a weekly fast every Monday night to Tuesday night and she reported that things were much different for her. She was much more energetic, much more –her mood was better overall. Her resilience was raised all the things that you know, you do and Martin Mattenson at the what is it – the head of the institute of aging --

Robb Wolf: Uh-hum.

Dr. John Ratey: --at NIH was a real big proponent of intermittent fasting for the immune properties of it. You know, exercise makes for a lot of stress molecules and free radicals and all that but then builds our machinery inside ourselves to resist that, to deal with that both at the moment but also in the future. But fasting doesn't have the same kind of burn but yet has the same kind of response of what I call the janitorial service of the cell. So that you're getting a bigger bang for the inner cell immunity and helping avoid the cognitive decline in Alzheimer's disease which is you know, he's written 600 papers on that the whole thing so.

But it really does have I think an important part to play and one of the recommendations was to fast specifically before one went into surgery. This is very different than what you know we used to do, not carbo load, but protein loading. And at times you have to do that. But by fasting, you will spend less time in recovery from the anesthesia. You improve the immune response and overall a much better healing process.

Robb Wolf: Interesting. Interesting.

Dr. John Ratey: So. Well there's a lot going on in that area, you know. You might have done in 2004 but people are really beginning to look right at it and say okay what can we do and not just the –your CrossFit types and all that.

Robb Wolf: Right. You know, it's just interesting within that crossfit scene and Doc this was a question that I kind of wanted to ask you about. You know,



clearly there are huge benefits with exercise. I wanted to talk a little bit about kind of like the dose response curve and then what types of exercise do I – I really like crossfit because it's a wide variety of activity, there's a fairly broad frequency band and you know, neurological inputs. You're doing some Olympic lifting, some sprinting, some basic gymnastic skills and whatnot. In the early days of crossfit, what the kind of ideal was a minimalist approach. Like a minimum effective dose as it's turned into this thing called the sport fitness.

Now it's do as much exercise as you can do without dying and that's where I started seeing some problems for folks when the volume and the intensity just continually kept ratcheting up and when that scene really has no periodized schedule then I started seeing some pretty serious problems for folks. You know a really kind of adrenal fatigue, cognitive dysfunction, thyroid dysregulation and that's where I started getting a little nervous about the intermittent fasting because the folks who were willing to subject themselves to that much of you who's doing the crossfit then they were also willing to tinker with the intermittent fasting also. But what are your thoughts on kind of best dose for exercise and types of things we should be doing? Should we be looking towards complexity of motor patterns, just do anything that we can? What are your thoughts on all that?

**[0:25:31]**

Dr. John Ratey:

Oh no definitely. The more complex the –you know, for instance your Brazilian fighting is sort of right up there with ballet and gymnastics and other forms of aerobic dance as probably the best type of exercise that you can do for your brain. Because not only are you challenging your brain by being in a high aerobic state for an extended period of time but you're also demanding that you position, that your attention is focused, that you're taking in information and that you're working against or with a partner which adds more complexity to the whole thing. So the dose responses I mean there's no number. I mean everybody wants a number and the answer is like you have come to for so many of your questions that people have asked you, it depends.

Robb Wolf:

Uh-hum.

Dr. John Ratey:

You know, it depends. You know, I mean do I mean blanket recommendations for everybody? Yeah sure. You know, they help me when services is close to it. They want to – they were saying do an hour a day five to six days a week and three of those days being in moderate to intense intensities. You know, and throw in some weight training and throwing down some coordination chips running and I think all those are

good starting points. If you do something like that or you splurge on a day and you go like Richard and I did walking in the mountains for three hours at a time every day that will be great too. But, you get your fill, but... So there's a lot of real variation.

When I've done CrossFit, I mean I get myself injured you know, I'm older so I –you know, you get into that whole feeling or that feeling of excitement and then and the goofiness of it and you want to do more. It's part of what we write about in the book too that this connects you to the – there's more to it with that connection.

Robb Wolf: Absolutely and I think that's part of why crossfit and dance and martial arts are so sticky because you get some exercise, you get some community, you are learning new things. So there's some really sticky elements there but it's just hard to remind people that it can be some very potent medicine and there's definitely a steep dose response curve with that. You need to keep that stuff in mind.

Richard Manning: And that's a really important point and to add to a couple of things that you've said here and because that's what we did in the book. We added to this and in your exercise program, you need to start looking for a twofers and threefers and fourfers. You're getting all these extra benefits going on. Of course you fly for instance I had to take mountain running because of the variability but also because of the challenges and the exposure to nature. I'm constantly being dealt these wild cards I have to deal with every day, snow, ice, wind those kinds of things that are cool.

Robb Wolf: Uh-hum.

Richard Manning: It gives you something. But the other aspect of that and it's intriguing to the degree that it's emerged in our research was the importance of group dynamics that you do these things with other people in some ways. I don't do them with other people. I do them with a dog but that kind of counts. But also I mean ultimately there was this intriguing kind of cul-de-sac in this that talked about – we thought about rhythmic movement, things like communal dance, that's been going on throughout human history. For 50,000 years we've been dancing together in circles moving rhythmically together. And what we found in that was that there's an extra component of regulation. It goes on with that rhythmic movement that actually speaks to our central nervous system and gives us some rewards and brings out that sense of empathy that our brains are so good at. And that those dance rituals actually had a function in bringing us together as humans.

Robb Wolf: Fascinating. You know, the whole development of music and when you look at the mathematics of music and then kind of the neural processing of music, it's always been a really –you know, I like to joke that I'm a militant agnostic which is somewhat funny if you think about it. You're militant about not knowing but if I have any moment of thinking that there might be some sort of greater connectivity to the universe it's actually in that whole musical experience.

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I did another Brazilian martial art called capoeira, which is set to music. It was actually developed in the slave quarters of Brazil and they kind of hid the art through music and dance and whatnot. It's been literally one of the most enjoyable things I've ever done. It's fun – so many different dials in my head that I was willing to pretty much drop off the face of the planet and live in the back of the car to do that the rest of my life. But I got into it too late to completely you know, throw myself off that cliff. But that's a fascinating piece and you know, it is interesting now that I think about it, virtually all cultures have some sort of a musical tradition like that that is kind of woven in the fabric of their societies.

Richard Manning: Yeah, it's a cultural universal or a human universal. Not only that, it's the one we share with other species. So there's precedent in evolutionary time for other animals making music and there's a rich body of research on that very thing. But what's fascinating about it is that clearly it emerged about 50,000 years ago when a bunch of other things emerged that made us human. They all came together and that's really the best evidence we have that not only our brains flowered at that particular point, they came together and reached those critical mass but that's what defines us as humans. So anything we find mixed up in that sudden explosion of humanity 50,000 years ago we ought to respect a lot and music clearly is part of that.

Robb Wolf: Interesting. You know, a question for both of you, for me the evolutionary biology picture or template is just so profound and ends up bypassing so much of the kind of reductionist mess that we have in medicine. Clearly reductionism and you know, the scientific method has been incredibly powerful. But it's been my opinion and I'm really only parroting stuff I've learned from Boyd Eaton and Loren Cordaine my mentors in this. But you know, the lack of an evolutionary biology framework particularly in nutrition but throughout medicine at large I would kind of argue has really led us down some very dead ends. That you know it doesn't oftentimes give us discreet answers about the way that we should do things but it's certainly the amazing place to start asking questions. But I've received a lot of criticism particularly from the academic scene about using kind of just so stories to articulate these

things to people. You know, it's interesting in academia the evolutionary biology story carries very relatively little sway at least the way that I think that you guys are articulating it in your book, the way that I articulated it in my book. But then when we actually get out and interact with real people who live and have jobs and you know, love and do all this stuff, this evolutionary biology story seems to be very compelling.

Like where do you guys see a balance in that in maintaining scientific credibility but also telling a story that actually is compelling and changes lives?

Dr. John Ratey:

Well I think that you're right on about medicine getting so reductionistic and empirical, evidence based and all this kind of stuff. You know, it has led us, led the public to expect that that's the way the world is. I think that's the frame that we have to shift and try to change to say look it's not just  $A+B=C$  that it's complexity, it's chaos theory, it's you know, all the different things and factors that you need to address. You know, the beauty about getting involved in any one of these health pathways is that it often triggers you in the other health pathways. In other words, you know, if you start dieting and pay attention to your glucose levels and all, you'll feel more like exercising. You'll sleep better and hopefully then you'll move into nature. You'll certainly be more mindful, all the things that we talk about in the book or the one case that we had a woman who decided she was going to sleep eight hours a night and that was going to be the thing that she was focusing on. That then led to all the others that, all the other things of exercise and a steady diet and all that.

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I think we need to and those stories absolutely but we need to begin to prove things and I think Dr. Perlmutter's book with Brain Grain or Grain Brain really begins to marshal a lot of evidence about –from the diet perspective about how we're losing our minds by living the kinds of lives that we're living these days.

Robert Manning:

Yeah and I think the area where this is going to pop up in intriguing ways. The thing we're going to be talking about ten years from now is a micro biome.

Robb Wolf:

Absolutely. Yeah.

Richard Manning:

And that really can be approached in anything other than understanding the complexity of that system and then with a little bit of the hints we're getting in that direction are just fascinating. But to go back to my point that we are an ecosystem, we are literally an ecosystem and restoration

ecology is really complex. We can't really have full health until we account for that ecosystem and its contribution to our health.

Robb Wolf:

That's been a final piece that I've been tinkering with maybe the last year playing with resistant starch, playing with some homeostatic soil organisms and you know, switching to paleo ended up just having dramatic benefit for me reversing colitis, irritable bowel syndrome, dyslipidemia and whatnot. But there were still some pieces in my digestion that had never really come back online properly from getting very sick from a vegan type diet. Then it was finally this inclusion of some resistant starch and product prescripto cyst which is there's a number of them out there but prescripto cyst is the one that I use, which is these homeostatic soil organisms. So it's different than lactobacilic organisms, which are their niche, is in lactate fermentation in foods whereas these homeostatic soil organisms live both in the soil and in the gut. I just can't describe how much better my overall health is.

Then interestingly Richard earlier on you mentioned that you know, with regards to carb tolerance it was very, very dependent on insulin sensitivity and I kind of have this sneaky suspicion that that was a final piece of the inflammatory story for me such that some low grade inflammation in insulin resistance that I had just been carrying around for years finally resolved itself.

Richard Manning:

That's fascinating because I think you just outlined a kind of discovery path that we're advocating that everybody is going to be on a path like this. You seem to have had a pretty good time figuring it out.

Robb Wolf:

Which I figured it out ten years earlier but it's better than ten years later that's for sure. [Laughs]

Dr. John Ratey:

We think that the genetic code is so confusing. When we start talking about micro biome it is really amazing how people who don't know about it. In medicine I think and certainly in my area we're just beginning to look at it let alone and acknowledge that it's really there, you know, and that we need to pay attention to it. Because otherwise we're barking up the wrong tree and it varies as much as the color of our hair varies. You know, it varies a lot from individual to individual so we need to be able to take that into account. People are beginning to study it which is really you know, it's like unpacking the brain, to unpack that micro biome, all those worms and bugs inside of us is really quite a story and it's going to be fun and interesting to be a part of.

Robb Wolf: You know, I don't know if you guys are aware but back around say 2002-2003 if you were on PubMed and you put in the term intestinal permeability, you may be got 200, 300 search returns as of maybe a couple of days ago. There's almost 11,000 search returns for putting in intestinal permeability. Interestingly the very – the second prompt that the search engine on PubMed will supply you when you put in intestines, it will say intestinal permeability as the second suggestion on there. So you know, a little bit over a decade ago, even talking about intestinal permeability was almost career suicide for a research or you know you'd be labeled a quack if you were an MD. Now this is some of the hottest area of research and immunology that you can find and that micro biome is really front and center in the whole story talking about zonulin and all kinds of inflammatory signaling cytokines and whatnot. Like you said it is so incredibly complex.

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To some degree this is the spot where I somewhat get off the bus and I'm just waiting for somebody much smarter than myself to tell me what the heck is going on with all that. I'm just waiting for the review article to summarize at this point. I've tried to keep up on it but it's too much.

Richard Manning: Well you know, I said that the word is micro biome now but it used to be 20 years ago it was the mitochondria then ten years ago it was endothelium and now it's micro biome. Which is good because then we'll really bang it and study it and people will be taught and understand that this is – it's so variable on the basis of what we eat, where we are, where we live, how we sleep, who we're with. That all that adapts and changes but it has such a powerful effect on our health and certainly on our brain and our mood and our minds.

Robb Wolf: Absolutely. Now guys when is Go Wild to be released? When is the release date?

Dr. John Ratey: June 3<sup>rd</sup>, it's coming up.

Robb Wolf: Coming up, coming up soon. Where will you guys be available for folks to come and see you for book signings?

Dr. John Ratey: Out and about.

Robb Wolf: Okay, okay. We can get updates on that and then I can post them to the website as those become available.

Richard Manning: Yeah we'll have them on our website as well. That's being set up now so we don't know the answer to that but they promised they'll tell us soon.

Robb Wolf: Perfect. Just in time to get the maximum airfare cost for the whole thing. Perfect. Perfect.

Richard Manning: Right.

Robb Wolf: Guys could you leave folks with maybe a list of three to five things that you know, that you guys would –you know, that somebody is going to get from reading the book and or maybe just that folks can take action on today that's going to really change their lives? Like what are some self-experimentation things that folks should be doing to get a little better results with their life?

Richard Manning: Let me start with one. I don't have to do three to five. I think that during the process of thinking about it, I ended up distilling it down to a really important one in my own mind and it had to do with happiness. You know, you're talking about doing the PubMed search earlier and I think Barbara Aaron Wright pointed out that if you do the PubMed search on depression you're going to get all sorts of hits. But if you do unhappiness you're not going to get any or very few because we don't think about it. But that complex organism that we are is really geared to taking care of our happiness ensuring it. It tells us we're on the right track with all of these things, with dying and everything else we feel better and we're happy and our lives are fulfilling. So that's your indicator and what we're really advocating here is that you reset the defaults in your body so it begins telling you that. It gives you reliable information on your happiness as opposed to say a drug addict or somebody like that or a food addict a carb addict. That it tells you you're on the right track and it ultimately becomes quite rewarding and you're going around with a smile on your face a lot more. You're probably on the right track.

Robb Wolf: I like it. I like that.

Dr. John Ratey: So it gives a big overarching meta look at what to think about but break it down a little bit, unpack it, how to get there. I think the biggest problem that I see I travel all over the world talking and the biggest problem I see aside from the horrible diets that we're infecting the world with is the sleep deprivation which because of our gadgets, because of our little you know, the cell phones, the computers, the digital world. People are not sleeping. They're just not sleeping near enough and kids especially but same with the adults. We're too wired and we don't get that sleep and when we begin to sleep, things really begin to change and get better.

Then of course so I think that exercise with a group is so important. The stickiness that you talked about and paying attention to being out in nature as much as you can be. Because I think these are magical – there's magic to it and you know, we can't tell why we can observe and say yeah if you have a hospital room with a view or a window in it, you're going to spend two days less in the hospital as somebody who doesn't. You know, those are empirical studies and you know, there's power in the past, in where we were, where we came from and we have to sort of get back to that so that we can achieve a positive psychology again.

**[0:45:06]**

Robb Wolf: Beautifully said. Richard Manning, Dr. John Ratey, huge honor to have you guys on the show. Again I'm a huge fan of both your works. You're really kind of heroes of mine with the work that you've done so it's really been a treat having you on the show.

Dr. John Ratey: Great. It's good to be with you and we'll come again.

Robb Wolf: Fantastic. After the book tour if you guys are not too sleep deprived nor too sick for a meeting out of airports, we'll get you back on and see what else you've learned by that point.

Richard Manning: Thanks very much.

Robb Wolf: All right guys, take care. Will talk to you soon.

Dr. John Ratey: Bye-bye.

Robb Wolf: Bye.

Richard Manning: Bye.

**[0:45:44]                      End of Audio**