



## **Transcript of “Beyond Paleo with Chris Kresser”**

Bulletproof Radio podcast #22



## Warning and Disclaimer

The statements in this report have not been evaluated by the FDA (U.S. Food & Drug Administration).

Information provided here and products sold on [bulletproofexec.com](http://bulletproofexec.com) and/or [upgradedself.com](http://upgradedself.com) and/or [betterbabybook.com](http://betterbabybook.com) are not intended to diagnose, treat, cure, or prevent any disease.

The information provided by these sites and/or by this report is not a substitute for a face-to-face consultation with your physician, and should not be construed as medical advice of any sort. It is a list of resources for further self-research and work with your physician.

We certify that at least one statement on the above-mentioned web sites and/or in this report is wrong. By using any of this information, or reading it, you are accepting responsibility for your own health and health decisions and expressly release The Bulletproof Executive and its employees, partners, and vendors from from any and all liability whatsoever, including that arising from negligence.

Do not run with scissors. Hot drinks may be hot and burn you.

**If you do not agree to the above conditions, please do not read further and delete this document.**

Dave: Today's cool fact of the day is that once you past puberty and stop growing [inaudible 00:00:11] it seems like you've settled in to the body that you're going to have forever, but the cells inside your body are constantly dying and being replaced in a process that's called cell turnover. This process is key to many of the bulletproof techniques we talked about because if you have better stuff to make cells you'll make better cells and increase your strength and resilience over time.

The average lifespan of all the cells in your body is about 7 years. It's kind of like you really are a new person every 7 years but there are some exceptions to that rule. Stem cells from bone marrow divide and produce about 2 1/2 million red blood cells every second, so your blood gets replaced almost completely every 4 months. For a long time we didn't believe you could even grow new brain cells but it turns out you actually can.

Co-host: You're listening to Episode 22 of Upgraded Self Radio with Dave from the Bulletproof Executive blog.

Today's interview is with Chris Kresser from [chriskresser.com](http://chriskresser.com). Chris is one of the smartest and most objective members of the alternative health community and he's got a great blog that I do read. His site produces some of the best content available on the web and we're thrilled to have him on the show.

We're going to talk about supplements, dairy, acne, biogenic amines, cooling, brain inflammation, heavy metals, fish oils, and a bunch of other stuff. This is one of our really, really, good episodes, maybe one of the best ones so far.

Dave: Chris Kresser is a licensed acupuncturist and practitioner of integrative medicine. He's one of the most well-known and respected health bloggers on the internet. He comes on Upgraded Self Radio today to talk about some of the most important things you need to know about health and wellness. I'm really personally excited to have Chris up here because I look at his blog before I look at many of the other blogs that I see. I think it's one that if you listen to the show should absolutely be on

your shortlist of blogs to follow for your own health and wellness and that of your family.

Chris, welcome to the show.

Chris: Thanks Dave. It's a pleasure to be here.

Dave: Let's just jump right in.

How did you get interested in diet and health in the first place?

Chris: Actually, I was probably one of those weird kids that's been interested ... that was interested and early on most of my friends were eating junk food and I grew up eating pretty healthy diet and I have my parents to thank for that. I think from a pretty early age I just enjoyed how I felt eating that way and I was a competitive athlete growing up and really interested in sports and performance and so I was eating what I thought was well then.

I wasn't aware of Paleo at that time of course, but I was doing my best to eat a healthy diet and all through high school I was pretty fascinated by nutrition, started studying ... studying it fairly early on and then I think I really got even more interested when I got sick. Some people who know me and my story, I did a lot of traveling in my 20's and I spent some time in Indonesia and I got sick with parasites and amoebic dysentery there which totally wrecked my gut. Even after I got rid of those pathogens I had a lot of rebuilding to do.

When I started to look around for help doing that in the conventional medical paradigm there really wasn't a lot of help available. I was pretty shock with the lack of understanding about nutrition and just basic physiology in relation to nutrition. I've decided that if I was to optimize my own health then I would have to seek out other sources of information and learn as much as I could about it, so that's pretty much how I decided to go back to school and study integrative medicine and then start a career helping other people do the same thing.

Dave: It's amazing what a little bit of enlightened self-interest will do for your motivation, isn't?

Chris: That's right. I couldn't agree more. I have no idea ... It's interesting to consider where would I be if I hadn't gone in Indonesia and gotten sick. I really have no idea but as difficult as that experience was for several years I'm completely grateful that it happened because I feel like what I'm doing now is my passion and I feel like I have a lot contribute in this area and I feel completely aligned with my purpose and what I'm doing here on this planet. I think there was ... whatever guiding force led me to that ... to this place, I'm grateful for it.

Dave: It seems like the universe will keep yelling until you listen.

Chris: The cosmic 2 x 4, I call it.

Dave: There you go.

Chris: I call it a 2 x 4 because in my case apparently I wasn't listening well enough because I got hit pretty hard with it, in such a way that I couldn't possibly ignore it. I don't really recommend that as a [inaudible 00:05:22], I think it's much easier if you listened more carefully early on, but of course that's easier said than done for most of us. Since sometimes it takes some kind of cataclysmic life event to get our attention.

Dave: It sure does. When I weighed 300 lbs. in my mid-20's and my brain stopped working that was pretty much my wake up call, but it's the same thing somebody's going to make you pay attention or you may be lucky and just be healthy enough that you never have to pay attention but then you're missing out on some of the really high performance stakes that you're capable of that you just wouldn't know about unless you started looking.

Chris: That's right. Sometimes I hear it from my patients who feel kind of jipped off that they got sick and what I often tell them is, "Look, a lot of people are just kind of getting by, and they don't really know that something's wrong because they look around they see a lot of other people feeling the same way and so who's more fortunate in that circumstance, somebody who gets a pretty serious chronic illness but as a result of that totally turns their life and their health around and maybe

discovers new things, like meditation or something that they wouldn't have otherwise gotten into, because of their health it completely improves other aspects of their life, or the person that's just kind of muddling through, is doing okay, doesn't have any serious problems but hasn't been motivated to optimize their health or their cognitive function or their psycho-spiritual emotional well-being?"

Dave: That's probably a great segue into one of the big questions that I wanted to ask you. One of the big topics for today is how gut health affects brain functions? Because you mentioned psychosomatic and the spiritual parts of things, and a lot of those seemed to just reside in the gut as much as they do in the head. What's your take on gut health and brain function and how they work together?

Chris: That's a great question. I think this actually one of the most fascinating and up and coming areas of medicine. If you look in the scientific literature over the last 10 years there's been a lot of studies published on the gut-brain access. It doesn't really percolated down into the mainstream consciousness yet but I think the connection between the gut and the brain is driving a lot of the modern diseases that are becoming epidemic now, like autism, Alzheimer's, dementia, depression, mood and behavioral disorders, in addition to all of the gut disorders that a lot of people are already familiar with.

There's pretty much no brain disorder that I'm aware of that doesn't have some connection in the literature to gut issues and there are no gut issues that don't cause some impact, negative impact on the brain. It goes both ways, but let's start by talking about the gut.

If you have an infection, like a parasite or an opportunistic ... overgrowth of an opportunistic bacteria or a pathogenic bacteria like H Pylori and then you have this dysbiosis which means an imbalance of good and bad bacteria in the gut, and then leaky gut or intestinal permeability where the gut barrier system breaks down and you get a penetration of molecules into the bloodstream that should never be there in the first place, all these produces inflammation, a chronic low-grade state of inflammation.

These inflammatory cytokines will then travel through the blood and cross the blood brain barrier. Now the blood brain barrier is another barrier system that in a normal healthy person is intact and would prevent that from happening, but these inflammatory cytokines, one of the impacts that they have is that they made that blood brain barrier permeable and you get a leaky brain in addition to having a leaky gut. You don't hear that phrase very often but it's actually a significant contributor to disease. These inflammatory cytokines cross the blood brain barrier and they activate the microglial cells in the brain.

We have two types of cells in the brain, we have neurons and then microglial cells, and the microglial cells are basically the immune system in the brain. When these cells get activated that's inflammation of the brain. This inflammation in the brain once it's turned on suppresses nerve conductions and then the decrease in nerve conductions is what causes all these characteristic symptoms and conditions like depression, brain fog memory, and cognitive problems, mood and behavioral issues, all of the things that are epidemic now and seem to be just increasing.

You also get a reduced motor activity in the vagal motor nucleus because about 90% of the output of the brain goes into the pontomedullary area which in turn goes into the vagus nerve or the vagus area, the pneumogastric nerve and that innervates the gut. This causes ... As you can probably tell this a vicious cycle that happens here and that's why we have a saying in functional medicine, "Fire in the gut, fire in the brain."

If the brain is inflamed you're going to have problems with the gut because a lot of the brains output goes right into the gut. If the gut is inflamed you're going to have inflammation in the brain because of the mechanism that I just mentioned, the inflammatory cytokines crossing into the blood brain barrier. This explains why there's such a tight correlation between gut and brain problems and if you think about two of the populations that have the most messed up guts, they would be seniors and autistic children.

Seniors have their Alzheimer's, dementia, memory issues, all kinds of cognitive problems, and they also have hypochlorhydria, low stomach

acid, atrophic gastritis, constipation, they suffer from a lot of gut issues or incontinence or something like that. There's a very close relationship there. Then autistic kids, I mean, show me an autistic kid that doesn't have gut issues. I've never seen one in my practice. I've never even heard of one. It's universal pretty much, and the common mechanisms there are neuro degeneration, degeneration of the neurons and also neuro inflammation which is the activation of those microglial cells.

The problem with the microglial cells becoming activated and inflamed is that in the rest of our body we have a very sophisticated system for regulating inflammation ... the inflammatory response. If we get a cut on our arm we'll have an immediate increase in inflammation and that inflammation is not all bad, it's necessary for life. We can't heal without inflammation.

But in a typical scenario if you get a cut on your arm the inflammation will start, that begins the healing process but once that's finished with the T regulatory cells or T3 cells it starts to turn off the inflammation and clear away the debris and get back to a normal state of functioning. That's just basic normal immunology.

But in the brain, the microglial cells it's a lot less sophisticated how those work and T regulatory cells can't turn off brain inflammation. Once your brain is inflamed it's very difficult to turn off that inflammation without some kind of intervention. I think this is what happens with elderly people or autistic kids or anyone who's dealing with a gut-brain access issue, is that even if you deal with the underlying cause sometimes that's not enough to hit the reset button.

A good analogy would be if you get stabbed with a knife and the person who stabs you pulls the knife out, that's a good start ... healing process, but that's not going to do it if you just take the knife out you got a big gaping wound there and there's still healing that needs to happen after that.

Dave: That is [inaudible 00:14:00] question in there. I know more people have brain inflammation than ... No, wait, what's the big reset button that you work with in practice?



Chris: The brain needs three things primarily to function well, that's glucose, oxygen, and stimulation, and by stimulation I mean neural stimulation and this is of course, things like being engaged in something you enjoy doing, exercising your brain by working on stuff, reading, even things like crossword puzzles, keeping your brain sharp, neurons need that kind of stimulation to function well, and this of course, is another reason why in the aging populations when that stimulation tends to decrease the brain doesn't do as well.

It also explains why, if you have a great aunts or a grandma who kept working or kept her mind sharp by remaining engaged mentally she probably aged a lot better than, maybe another relative who didn't do that. Stimulation is important, oxygen is crucial and glucose is crucial.

Two of the best ways to increase blood flow to the brain, which is what ensures that glucose and oxygen get there are exercise and acupuncture, if you have access to it. I think we might talk about this later in the interview but one of the main effects that acupuncture has that's beneficial is that it increases the blood flow. In fact I tend to think that that is the primary effect of acupuncture, it increases blood flow and if you think about it everything we need to heal and function is in the blood.

Glucose, oxygen, immune cells, analgesics, anti-inflammatories, pretty much everything we need is in the blood and that the blood is the main transport media so that's how we sent it around in different parts of our bodies. Exercise can improve blood flow. Acupuncture can improve blood flow. Then there are specific compounds that have been studied that can turn off brain inflammation, tumeric is one of them, curcumin but most forms of oral curcumin aren't very well absorbed, or if they are they are cleared from the blood pretty quickly.

There's a phytosome version of curcumin, the brand name is Meriva-SP, I think Thorne ... Thorne is a good company that makes it. You'll see it in some other products too, but this phytosome form is better absorbed and has a better effect than just eating tumeric, for example. Skullcap is an herb that has been studied in this regard, it tends to reduce neural

inflammation, as does green tea extract. Those are three compounds that are really good for turning off neural inflammation.

In terms of healing the blood brain barrier, which is obviously an important step in this process, alpha lipoic acid can be helpful with that and then glutathione repletion. I say glutathione repletion because taking oral glutathione is not a very effective way of repleting your glutathione status. It will just be digested to the combination of three amino acids. It won't really raise intracellular serum glutathione levels.

The best way to do that is by taking glutathione precursors like ALA and NAC whey protein, if you tolerate whey particularly the ... or exclusively the non-denatured forms of whey is a really good way of raising glutathione levels. You can do that by taking whey protein or even better you can just do it by having raw dairy products or fermented dairy products that have whey in them.

Dave: Chris, we launched about three days ago a line of whey protein that is made directly from raw milk without a cheese manufacture in the middle using basically like the very highest sense, lowest temperature. etc., etc., processing. Can I send you a bag of that stuff? I might be short of details, that's for sure.

Chris: I would love to. Great. Cool, it's great.

Dave: I've been using whey for years. I have brain inflammation. It's been a problem forever. This is basically the stuff that I use after all that stuff. Anyhow I won't take up the show on that but if you want to try on some whey I think it's cool.

Chris: I think it has some really interesting therapeutic uses.

Dave: Cool.

Chris: As far as this goes by the way, since we're talking about it to get this kind of effect or to maximize it, it's best to take whey on an empty stomach without anything else. It won't ... Certainly whey has other benefits if you put it in a smoothie or something and make the shake out

of it but to get the maximum impact on glutathione status it's good to take it alone on an empty stomach.

Dave: What about adding a little bit of fat for absorption? A little bit like 5%?

Chris: 5%, I think that could be helpful. I wouldn't do much more than that.

Dave: Cool. I'm soaked to hear your take on this, certainly my own biohacking experience on dealing with brain inflammation ... I haven't tried Skullcap for it but green tea totally and glutathione has been, I'd say transformative for me and for a lot of people who I coach. They're using it to recover faster and for basic mental performance enhancement, so very cool ways to fix the blood brain barrier.

Chris: Of course, this probably goes without saying but you want remove all the things that are destroying the blood brain barrier in the first place, like making sure that you're eating a Paleo primal type diet that's low in food toxins and avoiding things that aggravate the gut like antibiotics, medications like birth control pills, making sure that you're doing stress management, that's crucial. Stress, there's nothing that will tank your gut faster than chronic stress. There's so many studies that clearly demonstrates that chronic stress elevated cortisol levels, destroys gut functions and makes your gut leaky.

This is bad news for some people but alcohol has been shown, even fairly moderate alcohol consumption has been shown to cause leaky gut. If you have gut-brain issue alcohol's probably not a good idea, maybe a drink or two a week, may not play a significant role but the studies I've seen have shown that even as few as three or four drinks a week can increase intestinal permeability in susceptible people.

Dave: The alcohol thing, there's so much pressure from people, even in Paleo community to drink red wine which has its own set of toxins on top of the alcohol itself. Have you seen that data about alcohol increasing carbon monoxide levels in the blood for a little while?

Chris: No, I haven't seen that.

- Dave: That's an interesting little side point but if you're dealing with optimal states of mental performance or just dealing with not very good states, either of those says alcohol might not be your best friend there.
- Chris: Then in addition to leaky gut I just treated a study out not too long ago on alcohol and SIBO, small intestinal bacteria overgrowth, and of course that's related to everything that we're discussing here because gut dysbiosis causes inflammation, and inflammation starts that whole brain degenerative neuron inflammatory process. Definitely not a great idea if you've got this kind of pattern going.
- Dave: It's funny you mentioned SIBO, I was about to ask you about your take on that and for our listeners who may not know about that, SIBO is one of those things where you have too much vector, growing in your gut in the wrong place. Maybe if you just tell us how prevalent you think it is and how important do you think it is in overall in the health of people, not just chronically ill people but, and people who are walking out but maybe just aren't as strong as they could be. What's your take on SIBO and its importance?
- Chris: I think it's pretty important and pretty common. There's a guy down at UCLA, Dr. Mark Pimentel, who's done a lot of great research on the connection between SIBO and IBS. There's a very high correlation between irritable bowel syndrome and small intestinal bacteria overgrowth, it's over 40% last study I saw. Which means that over 40% of people who are diagnosed with dysfunctional bowel disorder, which basically mean the doctors don't know what it is.
- Irritable bowel syndrome is a diagnosis of exclusion, which means if they rule out that you don't have inflammatory bowel disease like Crohn's or ulcerative colitis, you don't have an infection, then they say that you've got irritable bowel syndrome. What Pimentel's work suggest is that, no, actually in many cases it's not just a functional disorder, it's caused by an overgrowth of bacteria in the small intestine.
- The small intestine contrary to the large intestine should be mostly sterile, which means it shouldn't have that much bacteria in it at all, but what happens in this condition is you get a translocation of bacteria

from the colon, where it belongs, into the small intestine, particularly the lower parts of the small intestine. Now the terminal ileum which is the last part of the small intestine is where a lot of our nutrients get absorbed and the final stages of digestion happens.

If you've got an overgrowth of bacteria in your terminal ileum you're not going to absorb nutrients from food very well, you're not going to digest food very well, you're going to experience gas and bloating, and changes in stool frequency, and then of course, you're probably going to experience all the brain related functions that we've been talking about here too.

Another connection that a lot of people aren't aware of, and I just a radio show about this not too long ago, is the connection between SIBO and skin problems, including acne vulgaris, acne rosacea, eczema, psoriasis, dermatitis, most skin problems that are commonly experienced have a connection with the gut. This is mediated by a lot of the same mechanisms that we've already talked about. You got inflammation in the gut and bacterial overgrowth, these bacterial species produce endotoxins like lipopolysaccharide, which in turn can cause more inflammation and skin is the largest organ in the body.

Skin is actually classified as an organ and when you have an inflammatory process it makes perfect sense that the largest organ in the body will be affected by that. SIBO through this gut-brain skin access can cause all those skin conditions or at least make them worse. In my practice, whenever anybody comes in ... comes to me with a skin issue, the first thing I do is treat their gut.

This is true even if they don't have gut symptoms, an interesting statistic is that about 30% to 40% of people with intestinal permeability did not experience any digestive symptoms at all. The way it manifest for them is with other things like skin problems or cognitive issues, depression, etc.

Dave: I just want to say it sounds like this is an extremely complicated process and one that a lot of people don't know very much about. What is the

one thing you do when somebody walks into your practice and they obviously have acne, what is the thing you do to heal their gut?

Chris: I put them on a ... Let me answer that in a second because you actually made me think of one of the biggest problems with the way that the conventional paradigms approaches this. The thing that actually usually happens when people go to the doctor with a skin problem, especially when they're a teenager, before they even ... Some doctors will suggest dietary changes, but most of those kids get put on antibiotics.

While certain antibiotics like Rifaximin are effective against small bowel bacteria overgrowth other antibiotics like the broad spectrum ones like Tetracycline, that they tend to put kids on for acne actually makes small bowel bacteria overgrowth worse. You have a really crotty situation here where kids are going in for acne, they're getting put on these broad spectrum antibiotics that totally wreck their gut floor and cause more small bowel bacteria overgrowth, leading to more acne. Then possibly end up on drugs like accutane which have been shown to cause Crohn's disease and other types of inflammatory bowel disease and even death. It's a really, really serious drugs with serious side effects.

Getting back to your question on me. The first thing I do if they're not already on Paleo primal type of diet is put them on that, but a lot of my patients are already doing that, because a lot of people come to me through my radio show or my blog, they're readers or listeners so they're already are doing that. If they're already on a Paleo primal type of diet and they're still experiencing symptoms, skin issues, I'll put them on a low tyramine and histamine diet.

I found this to be very helpful in most cases. Some people have problems breaking these compounds down due to reduced activity ... enzyme activity. Monoamine oxidase is what breaks down tyramines and diamine oxidase breaks down histamines and there are genetic mutations that can cause insufficiency of enzyme activity here and there some environmental causes too. Reducing the intake of those compounds which are mostly ... histamines and tyramines are mostly found in fermented foods, which ironically are very good for the gut. I'll come back to that in a second.

Some spices, some fruits and vegetables, you can Google for a list, I've got also a full comprehensive list in my and personal Paleo code and then I'll put them on probiotics and possibly prebiotics, especially because they're not eating fermented foods for a temporary period of time. In certain cases, if the SIBO is really bad and the gut is really inflamed I'll use the GAPS diet, which is similar to the Paleo diet, for those of you who don't know about it but it actually completely removes disaccharides and polysaccharides.

The main difference between it and the Paleo diet is on the GAPS diet you don't eat any starch and then it really emphasizes bone broths which are rich in glycine, which is involved in the regeneration of the intestinal lining.

Dave: That is awesome advise for people who have acne. I'm actually really pleased to have it on the show because we get questions like that in our forums and on the blog sometimes too and the idea of going low histamine to reduce that allergic response, that really deep inflammation of the skin it certainly worked for me when I was younger and it's a really important technique.

Chris: There's a couple more things on that note Dave.

Dave: Go ahead.

Chris: You can find diamine oxidase, there's some products called Histame, I think is one acid in it, so you can help the process along a little bit by taking that. The other thing I want to mention about skin issues is that I believe that most skin problems are autoimmune, in the sense that they're mediated by leaky gut. Some researchers like Alessio Fasano believe that you can't even have autoimmune disease unless you have a leaky gut.

I will treat people with ... particularly eczema and psoriasis for autoimmunity and that involves, of course, a dietary strategy, an autoimmune Paleo diet is a good start where you remove nightshades and eggs, and dairy products, at least for a time, so you can add them back in and see how they can affect you. But then it also involves

optimizing glutathione status because glutathione helps regulate the immune system as does Vitamin D and a number of other strategies for helping bring the immune system back in the balance and that produces great result as well.

Dave: You got a pretty strong arsenal there. I work with some really good acupuncturist but most of them are more Chinese herbal but not nutritional focus, especially more like the ... or the molecular side like you are, the combination of those two for controlling immunities is, maybe one of the more powerful things I can imagine.

Chris: It's interesting because acupuncture ... I always say it has three beneficial effects, one is increasing blood flow, the other is reducing inflammation, but the third is regulating Th1 and Th2 balance, those are the two different sides of the immune system that often get imbalance in autoimmunity.

Dave: I'm going to actually skip ahead because you brought up Th1 to Th2. One of my theories about why we're facing so much autoimmunity today, even people we don't know that they're having autoimmune problems oftentimes are, and I believe it's coming about through changes in the, called the probiotics of the planet but basically the microbes that are out there in our soil and in the air, and there's an increased aggressiveness and there are mycotoxins, these toxins that are formed by things in soil, mostly fungi, and they actually affect that Th 1 to Th2 immunity on top of a bunch of other things.

Number one, what's your take on mycotoxins in the environment and their impact on health and autoimmunity, and are you worried about those in fermented foods?

Chris: This isn't something I've looked into in great detail so I wouldn't consider myself an expert on it. I'm aware of the idea that mycotoxin contamination of fermented foods could cause a problem, but I guess I'm a little bit skeptical because I just .. fermented foods have such a long history of effective use and I do pay attention to ... I use three pillars for evaluating the usefulness of an intervention. One would be, evolutionary



wisdom, traditional wisdom, the second would be modern scientific research and the third would be clinical experience.

For something to pass through my filter and get the thumbs up it has to test out on all three of those levels. I've seen some modern research that suggest that mycotoxin contamination in fermented foods could be problematic, but when I weigh that against my clinical experience and the thousands of years of traditional use of fermented foods I have a hard time reconciling that conflict. I suppose I'd say I keep an open mind but right now it's not something that concerns me greatly.

Dave: I had a hard time reconciling it too but based on personal, just experiments, I finally realized it's very batch dependent. It's very hard to predict because for one person in one house where the biome looks like something they may have something and someone else might not. It's one of those things that is ... it's certainly, they're not always bad. In my experience I just know sometimes like something's not right here. My intuition or just repeated trials led me to think that's probably what it was but I wouldn't say all fermented foods are bad, just this can happen to them.

Chris: You know, what I would say too is that I think it's really context dependent and you mentioned the gut microbiome and its relationship with the overall global biome and microbiome and I think that's a really important thing to discuss because, and in fact I'm writing and I'm not sure when this show's going to air but I'm writing an article that's going to be published tomorrow on February 10th, about this phenomena here where we are experiencing as a species a permanent irreversible change in our collective gut microbiome.

Dave: Yes.

Chris: The consequences of this are shockingly great and shockingly misunderstood. We have trillions of bacteria and yeast in our gut that per millennia we've existed in a symbiotic relationship with ... the gut bacteria is comprised of 75 % to 80% of our immune system. It has impacts on everything from weight regulation to brain function as we've been discussing to circulation. There's pretty much nothing that the gut

isn't involved in, in some way and for the vast majority of evolutionary history that gut microbiome was fairly stable.

It was diverse and it varies from culture to culture depending on what they eat but there weren't global systemic changes happening, but since the advent of antibiotics which of course have lengthened our lifespan and saves many lives and play very useful roles in certain situations, but the consequence or the downside of antibiotic use is that we are now ... each generation is seeing a progressively compromised gut flora. That is I believe and I'm sure you would agree based on what you just told me that maybe the single greatest contributing factor above and beyond diet to the modern disease epidemic.

Dave: Yes.

Chris: This dramatic increase in autoimmune mediated diseases, and as you said before a lot of diseases that we previously did not consider to be autoimmune we are now understanding our autoimmune at least in part, and because leaky gut is a precondition for autoimmunity and because dysbiosis in the gut is one of the major contributors to leaky gut, I think it's pretty easy to make a case that this irrevocable change in the gut microbiome that has been brought about by poor diet, antibiotic, and other medication use is really one of the significant contributors to this modern disease epidemic.

Dave: Chris, that brings up an excellent segue to my next question which is about one of the most consumed foods that's been altered, affects our gut flora that I know you've talked a lot about in your blog and that's dairy. What do you think of pasteurized dairy? Are there any benefits to it and can you also talk about, maybe some of the risks or negative effects?

Chris: I think in general pasteurized dairy should only be consumed if it's fermented. Pasteurized dairy fat probably is, has some ... still some significant benefits like butter with conjugated linoleic acid and some of the fat soluble vitamins but the problem with pasteurization of dairy is that it kills the beneficial bacteria that are normally present in raw dairy

products, and those bacteria play a really important role in helping us to break down lactose and digest the milk proteins.

When you remove those bacteria through pasteurization it creates a problem for a lot of people who don't have the ability to break down lactose, which is a fairly significant percentage of the population. The other issue with pasteurization is it doesn't tend to kill all the bacteria and the ones that survive will proliferate, and so you can actually ... It's a myth that there's never any food borne illness that's caused by pasteurized dairy products.

There actually is and because of the risk of a single culture or strain of bacteria that doesn't get killed in the pasteurization process can really proliferate because there are no other beneficial bacteria keeping that growth in check. Another problem with pasteurized dairy is that it can't ... it usually is, it comes from cows that are raised in confinement feeding operations and they have no access to grass which is their natural diet, instead they're eating grains like corn and soy.

If you've seen any of these documentaries they're also eating gummy bears, chicken beets, all kinds of these weird stuff that they never should be eating in the first place, not to mention antibiotics and hormones and things like that. I consider pasteurized dairy to be a processed food and raw dairy to be a whole food.

The benefits to raw dairy are probably apparent based on what I just mentioned but they're the flip side of pasteurized dairy, so raw dairy has all of the beneficial bacteria still in it, but also it tends to be higher in the things that we're trying to get from dairy, like the fat soluble vitamins, like A, D, and K2, conjugated linoleic acid ... When cows are grazed on grass, particularly lush green grass in the fall and the spring you'll see much higher amounts of these micronutrients than you will from cows that are raised on gummy bears and grains.

Most raw milk or all raw milk is raised on grass some might be finished with a little bit of grain but raw dairies have to pass very stringent standards that confinement dairy operations don't because of the perceived risk of contamination of raw dairy. They tend to be much

healthier animals. They tend to be more better taken care of, and they tend to eat their natural diet which is important in terms of the nutrient content.

Dave: For people who are even more interested in the details about which milk is the best to choose, there is some debate about whether A1 milk versus A2 milk from different species of cows, and as you just talked about what the cows eat might differentially affect their immune response. What do you think of the whole A1 versus A2 milk debate?

Chris: I'll just come right out and say that there's not really any solid peer reviewed scientific evidence that supports this distinction. I've talked with Mat Lalonde and a few other people about it who have a better grasp on biochemistry than I do, but from what I've gathered in literature and from talks with PhD level biochemist like Mat it really can't be substantiated with our current knowledge. However, I do pay attention to anecdotal evidence and I have patients who swear that they can tolerate A2 milk whereas they can't tolerate A1 dairy products.

I get raw milk from the only farmer that I'm aware of in California that uses exclusively A2 cows. I can tell you that personally having consumed raw A1 milk before that and switching over to the A2 that, number one, it just tastes a lot better because of the fat content that's higher. It's almost like a mix ... it's like halfway between milk and cream. It's very rich and taste good, so on that basis alone I'm happy to have it, but I never really had any problems with raw A1 milk but I noticed that A2 just goes down much more smoothly for me.

Scientifically I can't see any support for that distinction but anecdotally it does seem that some people notice the difference.

Dave: Quick question there, do you know whether they carry goat stuff? Is its A1 or A2?

Chris: To the best of my knowledge it's A1. You need to do -

Dave: I'm guessing that too, but I don't know.

Chris: You need to do ... I pretty much assume all milk is A1 unless proven otherwise because the A1 ... the cows have been so interbred here in the States that the vast majority of them are A1. The farmer that I get my milk from does genetic testing to make sure that the cows are A2, and that's expensive, it's time consuming, it requires ... He is able to look at ... to go to a cow auction and look at cows and just by looking at them at this point can determine which ones are likely to be A2. Then he tests them and sometimes they're not and sometimes they are.

A lot of farmers are not willing to ... particularly farmers who are doing it on a commercial scale. This is a family farmer and I have a cow ... The only way you could get milk through him is through a cow share program. I think it's pretty unlikely that any commercially produced dairy would be A2 unless they're doing that kind of genetic testing and if they were it seems to me that they would be promoting it in some way, but maybe not because not a lot of people know about this this distinction.

Dave: Would your secret cow whisperer / dairy provider be interested in you mentioning his name on the air, so that he could get a few more cow shares or is he a [inaudible 00:45:08]?

Chris: I think so. Let me ... Do you guys have show notes?

Dave: Absolutely, a full transcript.

Chris: I feel like I should chat with him because actually we just got shorted this week because there's so many people joining and not enough cows. He can't keep up because it's so popular, so we only got half of our normal orders, maybe selfishly I'm not going to mention it yet.

Dave: It sounds kind of weird but getting good quality stuff is hard to do and one of my favorite beef supplier is Alderspring, which is this phenomenal grass fed meat. Since I started buying their stuff five or six years ago I think the rib eye is now four, five, six times more than it was ... I have more [inaudible 00:45:53] \$50 bucks on a steak that used to cost \$20 bucks.

- Chris: I'll check with him. I actually just saw him last night, we picked up our order last night and he had just sent in the genetic test for two new cows that he's interested in. If he gets these new cows he'll have a lot more capacity online, so I'll check with him.
- Dave: Nice. There's a couple more things we need to go through before we reach the end of the show. The first one is, I have a list of a few vitamins here and just have you kind of, off the top of your head talk about literally just a second of [inaudible 00:46:27] one, like how much is it most people ought to be taking, in what form, and maybe any other really short context about why they might be necessary.
- Chris: All right.
- Dave: Let's go. Selenium.
- Chris: Crucial for thyroid functions, especially T4 to T3 conversion. Some evidence suggest it protects against autoimmune thyroid disease. Best form methyl-selenium-cysteine. Dosage 200 micrograms a day if you're not getting much from food, maybe a 150 if you're getting some from Brazil nuts or other selenium rich foods.
- Dave: Iodine.
- Chris: Also critical for thyroid, forms of thyroid backbone hormone. A lot of people are deficient, I think it's hard to get from the diet. It's pretty much only present in sea food, sea weed and some fish particularly. Dosage varies a lot but the key critical thing is you got to start at a low dose like 400 micrograms or so and build up slowly over time because it can provoke and exacerbate autoimmune thyroid conditions if you take too much too fast and if you take it without selenium. Excess bromide can also cause iodine's deficiency symptoms and iodine can detox excess bromide.
- Dave: All right, fish oil.
- Chris: Ditch it and just eat a lot of fish. My recommendation is eat 1 lb. of fatty fish at least a week and then take some fermented cod liver oil on top of that. You're not taking that for the EPA and DHA so much as you're

taking it for the fat soluble vitamins like A and D and some E in kinomes. Too much fish oil like this 30 to 40 grams a day idea can probably increase the risk of oxidative damage and heart disease, so please don't do that. If you're not eating fish for whatever reason, yes, I do think it's a probably good idea to take something like wild salmon oil and maybe one gram a day.

Dave: How about krill oil?

Chris: My jury is still out on krill oil. I think it has promise. I'm just waiting to see more peer reviewed research that's not done by Neptune Naturals which is the company that makes krill oil before I really make a determination.

Dave: Fair answer.

CoQ10.

Chris: Everyone here who's on statins should absolutely be taking CoQ10. Statins depletes CoQ10 and muscle function, and ATP production is dependent on it. It's an important antioxidant especially for cardiovascular ... preventing cardiovascular disease. For those who aren't on statins and who are eating a diet that's fairly rich in red meat and particularly if you're eating red meat that's rare, I don't necessarily recommend supplementing with CoQ10 unless you have a particular reason to do so and you're not getting it through the rare red meat.

Dave: How about pyrroloquinoline, which I always just call PQQ like everyone else.

Chris: PQQ, you know what, Dave, I don't know much about that and I don't really use it in my practice. I don't feel qualified to comment on it.

Dave: That's a totally good answer and I appreciate you saying that. Iron?

Chris: I see way more people with too much iron than too little. In the time that I've been practicing I think I've diagnosed, maybe 15 people with iron deficiency anemia, however, there is not a week that passes, and I'm not exaggerating, that I don't see somebody with iron overload,

particularly men but also in women. Iron, like everything else too little is not a good thing, and too much is a very bad thing, especially in the case of iron it causes inflammation and oxidative damage. It can wreck blood sugar regulation because it destroys pancreatic beta-cell function.

I think it's one of the lesser known causes of hypogonadism, especially in young men because it really thrashes pituitary function and that's where the stimulating hormones are produced that would be the androgen production. Iron overload, big problem ... little known problem. I'm going to be writing a series on it and I'm also going to be giving a 40 minute talk on it at the Ancestral House in [inaudible 00:50:44] in Cambridge in August.

Dave: That's going to be really interesting to hear. I hope that you broadcast that one.

Tinol vitamin, B vitamins? What's your take on this?

Chris: Crucial for the methylation cycle which in turn is one of the most fundamentally important processes in the body, ATP production, neurotransmitter synthesis, detoxification all are dependent on methylation, proper methylation and a lot of people have issues with the methylation cycle. However B vitamins can produce nausea and other side effects, especially if taken on an empty stomach. Best to take them with meals.

I don't recommend supplementing with them unless you have a reason to do so, like I just mentioned. One of the best test that I know of for determining functional B vitamins status is Metametrix Organix profile, which looks at organic acid in the urine that are intermediaries of the methylation cycle. If you have a deficiency in B6 or B12 or methyl-tetrahydrofolate that will cause an increase in either urinary methylmalonic acid or say blue and then you can do what's necessary after that.

Dave: Chris, you really know your stuff. I love hearing you talk about organic acids on the show which perhaps some people probably never heard of, but if you really want to know what's going on in your metabolism I



think that's one of those live test that a lot of people just don't know about, including practitioners, but it's important. Thank you for bringing that up.

Chris: Sure.

Co-host: I'd like to just second what Dave said. Obviously it sounds like you know your stuff, but I'm guessing you didn't learn all this stuff in school either. For anyone out there who wants to learn what you know, what are your top 3 sources of information about health?

Chris: Good question.

I'm a total research dork as you probably know, I have RSS feeds and alerts set-up for different topics that I'm interested in, like brain access or gluten intolerance or any number of subjects, so I get notified when new papers are published on that. I like to read ... I like to start with the primary sources and read the scientific literatures itself. But I also do follow a lot of ... Well, not a lot anymore but some blogs, Chris Masterjohn, I really like a lot stuff in DNA. Some other more obscure blogs.

I study textbooks on subjects that I get interested in. Right now, I'm reading Jane Ways Immunobiology, which is a really fantastic textbook on immunobiology. Then I take some continuing education classes and go to conferences like [inaudible 00:53:41] symposium but also I've trained a fair amount with [inaudible 00:53:45] in thyroid stuff. I'm planning to go to the ME CFS Chronic Fatigue Syndrome Conference next year.

I guess it's a ... I often get questions, people ask me like, "Where would you go to study and learn what you've learned?" Unfortunately, that's a difficult question to answer because you're right I didn't learn a lot of what I know from my schooling. I've learned the basic and those basics prepared me to go out and build on that foundation myself, which is pretty much how I've educated myself.

Dave: It's that whole systems thinking thing that we talked a lot on the show and on the blog where you can't treat the body as a collection of individual components, that is a whole system and obviously you got that down.

Chris: Chinese medicine, I have to say, that's ... they've known that for over 3000 years, so I have a lot of respect for Chinese medicine, for really basic perspective like that.

Dave: Tell us a little bit, towards the end of the show here, about the Healthy Baby Code and the personal paleo code, and what you're doing with those?

Chris: The healthy baby code came really out of my own experience. My wife, we started trying to get her pregnant a little bit later in our lives. I'm 37 now, we started when I was 35 and she was 38 and it didn't happen right away. We were both already on a pretty good diet and that was ... Being who I am I just decided to dive in to the scientific literature and traditional sources and learn as much as I could about what kind of nutrition supplements could promote fertility, promote healthy pregnancy, and development of the baby and then a healthy natural birth, and promote lifelong health for the baby.

After I did that I offered a talk on the subject here locally at the Bay Area and it sold out within a few days of putting it up. I just thought, "Wow, there's a lot of demand for this information." Sorry, that's my healthy baby screaming in the background. There's a lot of demand for the information and I couldn't think of a better thing to get out there in the world because there's so many health problems with kids it just breaks my heart to see that they could be easily solved in most cases by proper nutrition.

Healthy Baby Code is an online program that basically breaks it down step by step, "Here's exactly what you need to do from a nutritional and supplementation perspective to optimize your chances of getting pregnant in the first place." "Here's what you need to do once you're pregnant to ensure the growth of a healthy baby." Then, "Here's what you do after the baby's born, to nurse yourself while nursing," and,

"Here's how you introduce foods once it comes time to do that." These are all the things that I've been following, of course with my wife in our 6 month old daughter.

I've gotten a lot of great feedback from the program and it's a ... you can find it at the [healthybabycode.com](http://healthybabycode.com).

Dave: Thanks for doing that. I just want to say I am a firm believer that if you get the first two years and pregnancy right for a child its far more important than what university they go through for their lifelong success. It just matter so much if people only understand that one thing, we would actually transform the quality of life on all next generation.

Chris: I couldn't agree more and earlier we talked about the explosion of research on the gut-brain access, but another area of this really exploding is called the developmental origins theory, which I'm sure you're familiar with. It basically holds that the 9 months in the womb are the most influential period of our entire life in terms of determining our health. That's a little bit depressing for those of us who are already born. Hopefully it's inspiring for those who are considering reproducing and having kids, and who have the opportunity to give their kids that first start that can stay with them for the rest of their life literally.

Dave: We're 100% aligned on that and certainly I would love to send you a review copy of the Better Baby book when we [inaudible 00:58:09] says it's ready. I'll make you like, check it out.

Chris: I would love to.

Dave: Give us some feedback that would be really important just for the next generation. That's why I wrote that. Why you did yours.

Chris: Absolutely.

Dave: It just matters.

On that note, we're running out of time and I'd like for you to say something about the Personal Paleo Code and we have one final question after that. Can you go another, maybe two minutes?

Chris: Sure. Personal Paleo Code won't take long. The way to think about it is it's the black box manual for the Paleo diet. I developed this because a lot of patients who are coming to me were confused about the Paleo diet. They read Robb Wolf and Mark Sisson and all these different bloggers and everyone's saying slightly different thing, and my perspective line is, "Look, with ... The Paleo diet's a fantastic starting place, absolutely," but within that context there are still a lot of room for individual variation.

In the Personal Paleo Code I take people through a 3-step process for figuring out what their own ideal version of a Paleo diet is, based on their own process of experimentation, which is the only way you can figure that out. You don't have to listen to me or Mark Sisson or Robb Wolfe, you can find out through your own experience, but a very systematic way of doing that what works for you and doesn't work for you and then you find [inaudible 00:59:32] based on your own goals and circumstances and needs.

For example, if you're a competitive athlete, training for competition your needs are going to be completely different than someone who's mostly sedentary and is like a computer programmer and doesn't exercise much. That's I think what's the missing piece for a lot of people with the Paleo diet. Then along with that there's a meal plan generator where you can plug in exactly what foods you're eating and not eating and hit a button and it will spit back a full Paleo meal plan with only the ingredients that are safe for you to eat. It's totally customized and personalized and that's at [personalpaleocode.com](http://personalpaleocode.com).

Dave: Cool. I love that, then you have to solve through experiment to get it right, which is totally true. We call that biohacking on [inaudible 01:0024] exactly. The idea that you're just going to turn a crank and treat it, run like kind of a robot that's coming out of assembly line. It's not like that.



Chris: Doesn't work.

Dave: Final question and we ask everyone that comes onto the show.

What are your top 3 recommendations for people who just want to perform better at every aspect in life? Across all of the names that you've looked at, medical, spiritual, psychological, everything, just your top 3 at the top of your head.

Chris: I'm going to keep this really simple, eat real foods, would be number one. Sleep more and better would be number two. Cultivate pleasure and enjoy life, would be number three.

Dave: That is an awesome list, Chris. Thank you so much for being on the show.

Tell us where you're at so we can make sure everyone who want to find you can find you.

Chris: You can find me at [chriskresser.com](http://chriskresser.com), that's C-H-R-I-S K-R-E-S-S-E-R and I've got a radio show called Revolution Health Radio that's in iTunes and you can also access it on my site I'm at Chris Kress ... [facebook.com/chriskresserlac](https://www.facebook.com/chriskresserlac), and Twitter Chris Kresser as well. I look forward to seeing you online.

Dave: Awesome, thank you Chris.

Chris: Thanks Dave. I really had a good time. I appreciate you inviting me on the show.

Co-host: If you enjoyed this you can help by leaving a positive ranking on iTunes.

You can learn more about biohacking by coming to [bulletproofexec.com](http://bulletproofexec.com) or following us on Twitter, checking out the blog or commenting on our forum which we just [inaudible 01:02:07].

## What We Cover

1. How did you get interested in diet and health?
2. How does gut health effect brain function?
3. What are several ways to cure acne?
4. Should people worry about heavy metal toxicity from fish?
5. Are there any benefits from pasteurized dairy? Are there any risks or negative effects?
6. Are there any benefits to raw dairy?
7. Is raw dairy safe?
8. What do you think of the whole A1 vs A2 milk debate?
9. Do you think the risk of mycotoxin contamination might outweigh the benefits of fermented foods?
10. What supplements do you recommend?
11. What supplements do you recommend people avoid?
12. What do you think of these supplements:
13. Selenium
14. Iodine
15. Fish oil
16. CoQ10
17. B vitamins
18. Pyrroloquinoline quinone
19. Iron
20. Why did you decide to do acupuncture? It's not exactly "paleo" is it?
21. Who are your go-to sources of information about health?
22. What are your top three recommendations for people who just want to perform better in all aspects of life?
23. What about the Healthy Baby Code – tell us more about it.
24. Are there any supplements you recommend during pregnancy?
25. What is the Personal Paleo Code?

## Links From The Show

### Featured

[ChrisKresser.com](http://ChrisKresser.com)  
[@chriskresser](https://twitter.com/chriskresser)



[Chris On Facebook](#)  
[Healthy Baby Code](#)  
[Personal Paleo Code](#)

## Food & Supplements

[Bulletproof Upgraded Coffee Beans](#)  
[Upgraded Whey Protein](#)  
[Medium Chain Triglyceride \(MCT\) Oil](#)  
[Hydrolyzed Collagen Protein](#)  
[Lipoceutical Glutathione](#)  
[Probiotic Ultra Blend](#)  
[Phytosome Meriva SP from Thorne \(turmeric\)](#)  
[Skullcap](#)  
[Green Tea Extract](#)  
[R-Alpha Lipoic Acid](#)  
[N-Acetyl-Cysteine](#)  
[B Vitamin Complex](#)  
[Selenium](#)  
[Cod Liver Oil/Butter Oil Blend](#)  
[Vitamin K2](#)  
[Vitamin D3](#)  
[CoQ10 \(Ubiquinol\)](#)  
[PQQ](#)  
[Extra Virgin Coconut Oil](#)  
[Kerry Gold Grass-Fed Butter](#)  
[Grass-Fed Meat](#)  
[L-Leucine](#)  
[Iodine](#)  
[Fish Oil](#)  
[Krill Oil](#)  
[Magnesium Citrate \(Natural Calm\)](#)  
[5-HTP](#)  
[L-Carnitine](#)  
[Acetyl L-Carnitine](#)  
[Lecithin](#)  
[Taurine](#)



## Niacin

Egg Whites International Liquid Egg Protein  
Eggology Organic Egg Whites

## Gear

Bulletproof Mindware IQ Upgrade Software  
HeartMath emWave 2

## Books/Programs

The Better Baby Book by Dave Asprey  
Healthy Baby Code  
Personal Paleo Code

## Mentions

“Fasted Training Boosts Endurance and Muscle Glycogen” by Martin Berkhan  
RealMilk.com  
Whole Health Source by Stephan Guyenet  
The Daily Lipid by Chris Masterjohn  
Mat Lalonde, Ph.D.

## Listener Q & A Summary

1. How can you hack Tourette’s syndrome?
2. Is meat bad for you?
3. Can you substitute n-acetyl-cysteine for liposomal glutathione?
4. Are egg whites on the Bulletproof Diet?

## Biohacker Report

“What Makes Each Brain Unique”  
“Adaptations to skeletal muscle with endurance exercise training in the acutely fed versus overnight-fasted state.”\*





\*Martin Berkhan also wrote [an awesome article](#) about this study.  
“STRESS AND THE GUT: PATHOPHYSIOLOGY, CLINICAL CONSEQUENCES,  
DIAGNOSTIC APPROACH AND TREATMENT OPTIONS”

## Questions for the podcast?

Leave your questions and responses in comments section below.  
You can also ask your questions via...

[The Bulletproof Forum](#)

[Twitter](#)

[Facebook](#)

## Listener Questions

Guest

What would be your best advice in terms of reducing symptoms or completely curing Tourette's Syndrome in an adult in addition to conventional advice (magnesium, niacin, taurine, lecithine and sometimes l-carnitine, 5-htp)?

Mason Z

Love the bullet proof coffee and the podcast. What do you think about what Dr. Furhman says about meat and butter?

[Click here to read Dr. Furhman's article on meat and butter.](#)

Any comment on it would be greatly appreciated.

Mac

Can n-acetyl-cysteine and alpha lipoic acid be used as a substitute for Lipocetial Glutathione.

Rick



Hey guys, love the show, keep up the good work. Was wondering what you think of liquid egg products such as that offered from:

Egg Whites International

[www.eggwhitesint.com](http://www.eggwhitesint.com)

Eggology

[www.eggology.com](http://www.eggology.com)

Lanas Egg Whites

[www.lanaseggwhites.com](http://www.lanaseggwhites.com)

Are these something you would include in the Bulletproof diet? Are there any powdered egg products you would recommend?

Don't forget to leave a ranking in [iTunes](#). It helps more people find our show.