Robb: Hey folks, welcome to the show and thank you for joining The Healthy Rebellion. Wife, how are you?

Nicki: I'm good.

Robb: You're looking quite dashing in camouflage today.

Nicki: I finally get to wear a sweater because Texas fall comes late.

Robb: You'd wear a sweater everyday, would just cost us $2,000 a month to run the air conditioning that much. So do you want to talk a little cool, newsy dealio.

Nicki: Yeah, let's do it.

Robb: So folks, we will have a link to this in the show notes. But from the journal Nature, there was a cool paper, alterations to the circadian clock make brain tumors vulnerable. And really interesting, it looks like both on the tumor and cancer promotion side, alterations in circadian biology, basically the way that we live in the modern world, not going to bed early, waking up late.

Nicki: Being on devices all night long.

Robb: Being on devices. Basically everything that leads into what Bill Lagakos would call a forward shift in circadian biology, which is more consistent with inflammation and accelerated aging. And this ranges from eating too few calories early in the day and too many calories late in the day, photo period exposure, exercise, everything we've been talking about for about 20 years. This is just another layer of this story. So people have noticed that they look, feel and perform better when their circadian biology is on point. But then also not surprisingly, our disease potential seems to be dramatically modified in the situations where either our circadian clock is properly attuned to our environment or improperly attuned. Another layer to this story is the timing of chemotherapeutics, may be really important based off your circadian biology. And this is a really emerging field, it literally is in its infancy, but this could be the thing that actually takes our current chemotherapeutics and radiation treatment methodologies and dramatically improves the efficacy. Just simply the timing.

Nicki: So getting patients that already have brain cancer to get their circadian rhythm dialed in.

Robb: Dialed in as much as possible.

Nicki: Outside, as early as possible in the morning, sunlight on your person.

Robb: That's one piece of it. Stack the deck in your favor as much as possible. And then on the other side of this, the specific timing of when they do radiation or chemo may be really, really important in how effective the treatment is and also in the relative side effects that people experience. So interesting piece, we will have a link to that in the show notes but it just goes back, the same old song and dance.

Nicki: We're not meant to be inside all day long and exposed to artificial lights all day long and all night.

Robb: All of that stuff. But for me I guess it's a little bit validating in that, so back as far as 2001 when I first read, Lights Out, Sleep, Sugar and Survival, that basic recommendation is still really powerful and honestly gains increased credibility every single day and that was and still is one of the best books that couches this whole discussion from the ancestral health evolutionary biology template. And so circadian biology will probably improve both bikini performers and everybody else. So it actually is important.

Nicki: Great. I'm going to jump into our sponsor ad for today's show. This episode of The Healthy Rebellion Radio, is brought to you by our show sponsor Elemental Labs. If you haven't tried the amazing electrolyte drink mix that is LMNT Recharge, you should.

Robb: I would try some but you stuck it over on that side of the table and so my Billy Bob mason jar is inaccessible right now.

Nicki: So we formulated LMNT Recharge after recognizing the benefits of proper electrolyte intake, particularly for folks eating a lower carb diet. We looked and looked and looked and couldn't find an electrolyte product that actually had sufficient electrolytes. And the products we did find were chock full of sugar. So if you're eating on the lower carb or keto side of things, if you train hard, if you live or work in a hot environment or if you're struggling with the keto flu, you need electrolytes. You can check out Element Recharge at drinklmnt.com. That's D-R-I-N-K-L-M-N-T.com.

Robb: So have that list of problems. Could we break it down as A or B, A and B, A, B, C, and D or none of the above or all of the above, kind of like an essay TRE question.

Nicki: Yes.

Robb: Okay.

Nicki: The answer is yes.

Robb: Let's do that next time. Let's do that next time just to make it as confusing and obfuscated as possible.

Nicki: All right, let's jump into our questions for today.

Robb: People are going to hope that we jump into something like a trash compactor and turn it on.

Nicki: So you're making me think of that Star Wars. Is it Star Wars? Please tell me it's Star Wars and I'm not like-

Robb: Yes it is Star Wars.

Nicki: Okay good.

Robb: Wife, just don't do Star Wars like-

Nicki: It's the trash compactor scene.

Robb: You can dabble in making mistakes with the Marvel universe because it's kind of new and there's not the expectation there, but getting a Star Wars reference, that-

Nicki: Hey, you said trash compactor and that's the first thing I thought about.

Robb: But then you questioned it.

Nicki: Well because I ... yeah. Okay. Let's just move on. All right. We have a question from Kenny on muscle loss. "Hi Rob. I've lost 35 pounds over the last year on keto." Yay. "The most recent 12 pounds of weight loss occurred over three months and I took a DEXA scan before and after. The results were surprising. Five pounds fat loss and seven pounds of lean tissue loss. I've tried restricting total calories, but keeping my protein high, I weigh 220 pounds and my protein intake is 150 grams. And during these three months I also did fewer CrossFit workouts than normal due to an injury. What should I focus on to make the next three months better? Is this a sign that I am restricting calories too much? Thanks for all you do, Kenny."

Robb: Man, this is a good question. So clearly he's doing CrossFit. Was he mentioning other stuff? So a couple of thoughts here. Resistance training exercise, which CrossFit can be resistance training exercise.

Nicki: Depends on the programming.

Robb: It depends on the programming. If it's a bunch of dead lifts and pull ups, then it's kind of resistance training. If it's concept to rower, to running, to Airdyne, then it's not resistance training. In general, resistance training under any circumstances you want to talk about is really beneficial for maintaining muscle mass and although 150 grams of protein is not a poultry amount for someone in a caloric deficit, more maybe, more appropriate, something that wasn't mentioned here is how many meals a day Kenny is eating and so if he's doing the one meal a day deal, this is where it's so interesting.

Robb: We had the old mid 90s Barry Sears, eat eight meals a day. Basically have one block meals that you ate every five minutes and that way you kept everything on a complete baseline. We now know that that's probably not a great thing. But then, although there are benefits to time restricted eating, intermittent fasting, from a muscle gain or muscle maintenance story, we do want multiple kind of anabolic exposures. You need a whole protein, you need about 25 grams of protein at a minimum to be able to hit this kind of anabolic signaling threshold that's based around these branch chain amino acids. And the calorie restriction definitely increases that need. And so if he's only doing two meals a day, that may not be enough. We may need three meals and maybe we bump this up to 175 to 200 grams of protein a day.

Robb: And then the cool thing about just adding protein, like if you were to add just very low fat protein sources, there've been some fantastic protein over feeding studies where they dramatically overfeed folks on protein and it's hard to make them fat. They actually gain lean muscle mass even without strength training. Now this is in generally sedentary people, so you're not going to turn yourself into a bodybuilder or power lifter doing this, but sedentary people gain lean body mass without training just because they were doing a protein over eating process and they gained virtually no body fat because it's just super inefficient to store body fat from excess protein because of the thermic effects and needing to deaminate the proteins and whatnot. So again, the things for Kenny that I would take away in addition to everything else, the circadian biology and sleep and stress and all that jive, definitely make sure that you're doing resistance training three to four days a week.

Robb: Each one of those could be kind of a full body session. It doesn't have to be exhausting, but you need to promote a stimulus for sure. We definitely want you eating at least three meals a day and maybe bump up the protein intake as high as 175 to 200 grams of protein per day. So if he's been losing weight at this current, pretty good clip, that's what, four pounds a month, which is frisky but not unreasonable. But if you want to maintain approximately that same caloric intake than bumping up 50 grams of protein, that's going to be like 200 calories, so not a big deal. And those calories are not going to count the same way as adding 20 grams of fat.

Nicki: Okay. All righty. Kenny, if you do that and then retest your DEXA scan, let us know how that ...

Robb: Yeah, and if you keep your eyes peeled, you might be able to circle back up with our call in show and we could dig into that stuff a little bit.

Nicki: Yeah, that would be awesome. Okay. We have a question from Nick on butyrate supplements for gut health. Nick says, "Because butyrate is important for gut health, do you see any potential benefit to supplementing purely for gut health, even for those who are not on a ketogenic diet but rather consume more of a lower carb paleo diet?"

Robb: This is a great question and it's interesting. This is one of the boogie man that was thrown out around the fear of reducing all manor of fermentable carbohydrate too low and then the gut bacteria would consume the glycocalyx, the kind of glyco protein matrix around the gut lining. And I think that there are instances in which this occurs, but it's also worth noting that when people are in a ketogenic state, the beta hydroxybutyrate actually diffuses into the gut lining and appears to feed both bacteria and intestinal cells. So the boogie man of a low fiber intake in the context of a robust, I guess, ketogenic state is not as clear to me as what it was, say like in 2010 when Paul Jaminet brought up some great questions around this stuff. And again, not everybody's gut health is going to be optimized on a ketogenic diet or a low carb diet, some people are going to do better at other places. But I don't think that it's nearly the boogie man that we've seen before.

Robb: Okay. Getting to the question, would supplemental beta hydroxybutyrate help with gut health? I don't know that it necessarily would. What we ended up doing in that scenario is usually displacing other fuel substrates and then kind of preferentially using the ketones that we get from like a ketone salt solution or what have you. And also if you're not well fat and ketone adapted, then you have a tendency to not use them as well and we do tend to excrete them in the urine. So this is kind of a ... if you are following kind of a low carb type paleo diet and you want good gut health and I would try to find fermentable carbohydrates that works well with you so that you produce the butyrate and the propionate and the malonate and all these other short chain fats that do benefit gut health, I would be suspicious at this, just as a standalone, would be beneficial. Yeah.

Nicki: Alrighty. Let's see. Next we have a question from Miranda. She says, "I think I'm under fueled. How do I fix it without gaining all the weight?" She says, "I lost about 30 pounds a year and a half ago and while I'm okay with my body right now and have maintained the results, I would really like to make some progress, but I'm stalled. My weight loss was done mostly through jogging and reduced caloric intake. I have maintained running about twice a week and I've started some bar training to target specific muscle groups. Since my stall I have started intermittent fasting. Now I find it difficult, even on my normal eating days to eat more than 1200 calories. I haven't seen any real results from the fasting. I think I am under fueled. I'm five foot seven and 158 pounds. My main

question is how can I get back to normal eating habits without gaining a bunch of weight back?"

Nicki: "And how long until my metabolism will get used to my new eating habits? Currently I sleep about seven to eight hours a night. I try to eat 15 to 20% carbs. I'm gone for 12 hours a day, five days a week, for work at a semi-active job, depending on the season. My heaviest area is in my midsection, which makes me consider insulin levels as the culprit. However, I've been intermittent fasting for three to four months now, which is supposed to help with insulin resistance. Is my metabolism totally screwed and how do I start to see results again?"

Robb: Oh man. So I haven't been able to read it. Maybe we'll use this paper for the next lead in for the next podcast, but it's talking about the physiological insulin resistance that occurs in the fasted state. And so it's so interesting, if somebody is insulin resistant from over eating, then reduced caloric intake by hook or by crook can definitely improve insulin sensitivity. But there's a give and take to that. Part of what occurs when we are in a hypo caloric state is that we do tend to shift towards fat metabolism. We do tend to limit the utilization of glucose as a primary fuel so that we can produce ketones for the brain and stuff like that. And to facilitate that. We become peripherally insulin resistant, mainly in the muscles, not so much in the adipose tissue, which is kind of a kick to the nuts. But with all the fasting and everything else ...

Nicki: And we don't know how much protein she's eating. She mentioned she's eating 15 to 20% of her caloric intake from carbohydrate but is the bulk of the other stuff fat or protein?

Robb: Right.

Nicki: She might be tackling the keto diet with a fat centric approach versus a protein centric approach.

Robb: Absolutely. Well and if she's 15 to 20% carbs, she's just kind of at that low wind of the low carb spectrum, I guess, probably peri ketogenic. But is the protein intake adequate? Jogging is awesome. The bar method is awesome. But I've got to say for body composition changes, a basic barbell program, squat, dead lift, press, bench, row, chin, rinse, lather, repeat.

Nicki: Sprints instead of jogging.

Robb: Yes. Sprints instead of jogging, those things just definitely tend to lend themselves nicely to good body composition changes and the punctuated stress, you can't overtrain yourself with those things. But the punctuated stress just seems to be something that we better adapt to. So I guess trying to ... a couple of different things. We have a great article which I've been thinking about 20 different contexts where we need to highlight this thing again from one of our trainers at Nor Cal, Sarah Strange. They now have basis, strengthen-

Nicki: Health and performance.

Robb: Health and performance, in Chico, California. She wrote this amazing article called Carbs Reloaded and this was back when the carb back loading stuff was going on.

Nicki: 2014

Robb: Yeah,. yeah, maybe even earlier than that. And so everybody thought that it was a carb back loading piece and it wasn't and it was hilarious. People would seemingly read the whole article and still think it was a carb back loading piece. But again, it was not. But it was pulling off of some work that Mike T. Nelson has done in what he calls reverse dieting, where people have gotten down to these very low calorie intakes and then how do they kind of get themselves back out of that? And it's just a very incremental step wise process, like adding about 50 calories a day for one week and then a hundred calories a day for the next week. And so it's just a really incremental process so that you can kind of see how your body's responding. And it is really interesting that you can have a dramatic up or downregulation in your kind of metabolic rate based off your food intake.

Robb: Some people in certain situations can reduce food intake and their body temperature will drop, their physical activity will reduce and so overall they're non exercise, neat non exercise thermogenesis, I think is what the acronym is. They basically burn fewer calories and so just simply restricting food doesn't always result in a reduction in body weight because if you do less because your brain is telling you, "We have less nutrients." Then there's this kind of downward spiral. The flip side of that is that you can also kind of tell your metabolism, "Hey, I'm eating some more calories but we don't necessarily need to get fat from this." And so you can kind of step wise, increase that. And again, this kind of safe spot to go for increasing caloric intake, for improving metabolic kind of burn because eating protein is thermodynamically inefficient, you convert it into stored body fat, very inefficiently, increasing protein intake is going to improve body composition, it's going to kind of improve that thermic effect of food.

Robb: So in that process of upping calories, I would definitely go out on a limb and say maybe you focus on protein first and then do kind of a step wise fashion with that. So maybe like 25 grams of protein per day increase and run that for a couple of weeks and see how you look, feel and perform. And then maybe we add a little bit more carbs or maybe a little bit more fat. But again, doing maybe about 50 calorie per day increments with that, which isn't a lot, but it sounds like she's pretty fastidious with what she's doing and she's made some good progress, so let's be careful with this. And then the goal would ultimately be to get to a point where the body composition is good, the performance is good, she's more comfortable with the level of food that she's eating. And then just kind of instinctually she'll be able to look at what's an appropriate amount of food to eat and kind of maintain. This level of scrutiny is not necessarily forever and should not be the goal.

Nicki: Right. And Miranda, definitely keep your eyes out, we'd love to hear how you do so either call back in or shoot us an email so we can see how that goes. All right. We have a question from Christie on collagen protein. "Hi Robb and Nicki, just wondering, should protein from collagen count towards someone's daily intake of protein? I keep finding conflicting information. I've read that-

Robb: Conflict on the interweb? Never. Shut the front door.

Nicki: "I read that due to collagen not containing all the required amino acids, that it shouldn't be added to one's daily macros. If this is true, does that make protein powders and bars from collagen sources obsolete? What are your thoughts?"

Robb: Oh man, this is a good one. So I'm a fan of collagen, we've talked about it on the show previously, whether it was a show or a previous show, we've talked about it. At a protein metabolism level and Chris Masterjohn is so, so deeply steeped in this stuff, but

looking at glycine versus methionine ratios, we get glycine from collagen sources and we tend to get methionine and sulfur rich amino acid from more, meat and eggs and fish and stuff like that. And over abundance in methionine can lead into problems with homocysteine and inflammation, possibly some gut health issues. And so that balance is kind of important from an inflammatory standpoint. So collagen is important there. I was just reading some interesting research that folks who were exposed, and it was a really nicely done study where they had folks that were exposed to sunlight or UV light, I forget, I assume it's like a UV lamp.

Robb: And they assayed these people for DNA damage and also for collagen damage and the people that were supplemented with collagen had less skin related alterations from the sun exposure. So it's substrate for helping to repair connective tissue and skin, so it's good in that way. Where it kind of falls down is again, so we've had two, three questions related to body composition and kind of fat loss and whatnot. It is not a powerhouse in improving body composition because it doesn't have the branch chain amino acid, so it doesn't get the anabolic signaling. But I would also say that sometimes ... the problem is that collagen is good stuff. It should be part of what we're doing, whether you're saving the bones from the critters that you're eating and turning it into bone broth yourself, or doing kettle and fire, eating chicharrones or whatever million ways that you want to do that.

Robb: We should have it in the mix. But then there are also just some nefarious shitbags that package this stuff up and sell it like it is the fountain of fucking youth.

Nicki: Stuff over the rainbow.

Robb: Yeah. And they make a lot of fucking money off of it. And some days I'm kind of like, "Why didn't I do that?" I actually like being able to go to bed at night and look at myself in the mirror and stuff like that. So it's not an either or thing, it's a little bit context driven. I could definitely make the case that most people would probably benefit from having more whole food collagen sources in their diet. Paleo Valley has an amazing collagen bone broth powder and I mean this stuff mixes up like nothing that I've seen. It's really cool. We don't have a affiliate deal with that. If you want to check those folks out, it's really good,

Robb: But I could make the case that you do want to put some effort into the balance of both of these, but then at the same time, this definitely shouldn't count towards your protein minimum and because protein in general is so thermodynamically inefficient. Again, we've got a real theme going on here. Adding that to the mix, that is not going to be the make or break deal, a 20 gram aliquot of that post workout or post sun bed or something like that, is not going to break the bank.

Nicki: So focusing on getting your main protein from real food sources and then if you add in a shake here and there, it's not the end of the world.

Robb: Not the end of the world, shake, bar. I have found the collagen bars to be a little challenging. I need to be pretty hungry to want to eat those, so yeah.

Nicki: All right. We're at our last question for this week from Maya, vitamin D for the dark skinned. "Hi Robb and Nicki, absolutely love these question and answer podcasts. I've learned so much from these sessions. Please keep it up. I look forward to every single one of them." That's awesome. "My question relates to vitamin D production from the sun, for me and my pigmented brothers and sisters. Since melanin blocks vitamin D

synthesis, would sunbathing for 15 to 20 minutes a day provide any significant benefit other than a tan? Would I be better taking a supplement form of vitamin D? Have darker skinned people evolved to have less need for vitamin D given how difficult it is to synthesize it from the sun? Sincerely, Maya."

Robb: Yeah. Really great question and again, I've learned a ton about this from Chris Masterjohn. Maya asks a great question. Near the end, are darker skin people evolve to need less vitamin D. Interestingly, if I'm recalling correctly from Chris's work, lighter skinned folks probably are more okay at lower vitamin D levels than darker skin folks. So even though it is more difficult for darker skin folks to produce vitamin D, there is still kind of an expectation that these folks are exposed to more sunlight. And it's worth mentioning that everything in biology is a trade off. So part of what's occurring in the protection against the process of UV radiation making its way through the skin, it produces vitamin D but it destroys folate, folic acid. And so people can end up in a folate deficiency state if they get too much UV exposure.

Robb: And it's kind of outside the scope of how far down that rabbit hole I want to go in this. We could maybe do something on the healthy rebellion at some point. Kind of break this stuff out and kind of look at what are the scenarios where this higher foliate status matters. And interestingly, we see these alterations in the MTFR geno types and methylation in Northern European populations, which has a tie back to the lighter skin and the interplay between UV radiation and all that stuff. So at the end of the day, I think that folks with darker pigmented skin still get all ... need, arguably make even more of an effort to get out in the sun and entrain that circadian biology. Certainly supplements can be beneficial, but there's all of these other beneficial CECO steroids and co factors that are consequences of that UV radiation coming in and creating the cascade towards vitamin D synthesis.

Robb: And so you could make the case that those folks need to make even more effort towards that. And like on my phone, I have this app called D Minder and it will take your location, you input what your relative skin type is, how much clothing you have on, and it will help you to manage your time in the sun so that you kind of optimize vitamin D, while minimizing the likelihood of producing skin damage. But really, really good question and I'm stoked Maya, that you've enjoyed the podcast and thank you for your question.

Nicki: Yeah, that was our final question for today's show. Anything else you want to add?

Robb: I don't think so. No, I don't think so.

Nicki: Okay. As always, you guys can submit your questions at robbwolf.com on the contact page. You can also submit them inside The Healthy Rebellion. So if you'd like to join the conversation and be a part of that, you can go to join.the healthy rebellion.com. We will be taking questions from Healthy Rebellion subscribers preferentially. Just keep that in mind. And then also be sure to check out our show sponsor Element Recharge at drinklmnt.com.

Robb: See you all soon. Take care.

Nicki: Oh, and I almost forgot. If you like the show, please subscribe and leave us a review on iTunes or wherever you consume your podcasts.

Robb: And we will talk about this a little bit more, but I think we're going to try to do something where nifty reviews, maybe get some swag or something. We're still figuring out what to do with that.

Nicki: Yeah, yeah, we might be highlighting a few of them and sending gifts.

Robb: Cool. I like it.

Nicki: We'll see.

Robb: Thank you guys again.

Nicki: Thank you.