Young Forever: The Emerging Sciences Of Longevity Transcript

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Introduction and Guest Welcome

– Welcome to another session of the reverse inflammation, summit body and mind longevity medicine and I'm your host Dr. Robert Lufkin. I'm joined today by my co host Dr. Steve Sideroff off. Hey Steve, how are you?

– [s] I'm doing great Rob, it's a pleasure to be here with you and I'm very much looking forward to our speaker today. Dr. Mark Hyman is a practicing physician and an internationally recognized leader, speaker, educator and advocate in the field of functional medicine. He's the founder and director of the Ultra Wellness Center, senior advisor for the Cleveland clinic and for functional medicine and a 14 time bestselling author on the New York Times Bestselling list.

So wonderful to have him here. I'm looking forward to our meeting. Welcome Mark and it's a pleasure to have you here. – [m] Thanks for having me. – [s] Thank you.

Thank you. And my co host Dr. Rob Lufkin. – [r] Great, yeah, I'm excited – [s] Before we really dive into the subject really deeply. Can you tell us a little bit about how you got interested in the area of aging and longevity – [m] While I'm getting older out of self interest and actually jokingly but in part that's true.

Defining Longevity and Biological Aging

And it's just the natural consequence of digging into the root causes of why we get sick and how we age and functional medicine has been the work of my life and through that lens I've been able to understand where we're headed in medicine, What's emerging and what's important and how we begin to rethink what we're doing from the perspective of creating health as a way of treating disease rather than suppressing disease or aging with some intervention that blocks interrupt something in the body.

How do we activate the body's own innate feelings? – [r] I love asking our speakers and this is a question we ask just about everybody. Before we get into the details of it. Let's step back and maybe just tell us, Mark, how you conceive of longevity and aging, Why we age? What's the framework you use for that?

– You know, we're we've come a long way in our understanding of the biology of aging. It was thought of as this normal, inevitable consequence that we grow old, decrepit frail and get chronic diseases as we get older.

But the truth is that our biology has the capacity to regenerate, rejuvenate, prepare and reverse our biological age at any time. Whether we're 30,40,50,60,70,80,90,100 or more. We have that innate capacity so unlocking that has really fascinated me. And I've seen just remarkable things in my practice reversing what seemed to be end stage diseases, heart failure, kidney failure, late stage diabetes and seeing what would be thought to be miracles.

But they're not, they're just inevitable consequences of understanding the nature of biology and the laws of biology and how we can activate the body's own healing system through understanding what causes imbalance in the body and how to restore balance, which is really the fundamental framework of functional medicine take out the best of putting the good stuff and let the body to the rest.

– But it's really great and motivating to know that you have found ways of reversing some of these processes of overcoming what a lot of people think is our inevitable. I'm wondering in terms of body and mind what you're saying, what role do you think stress plays in this process?

– I don't know. I mean stress is, you know, is a ubiquitous phenomena and it's not necessarily bad. It's it's uh in fact some stress is actually help you live longer on our thermal regulated, environmentally controlled perfect worlds where we sort of absolve ourselves from having to do physical work from extremes of temperature and shifts in our ability to find food.

We basically create an environment that's bad for us. And so I don't think that's what stress is bad. I think it's it's the um mental stress that is the result of our thoughts and our beliefs and ideas that often create the most harm.

Stress is not necessarily what happens to us. It's what we make of what happens to us. It's not the reality of what happens to us. It's the perception of the reality of what happens to us and the biology of this is very, really clear.

I think I don't know if it was prevention or somebody in medicine just define stress as the real or imagined threat to your body or your ego. So it could be a real threat to your body. Such as somebody having a gun to your head or it could be that you think your wife is cheating on you, but she's really not and you still have the same physiological response.

So learning how to master our mind is a key part of maintaining our health. Our lives and actually mindset and meaning and purpose are really happiness and optimism are really key parts of longevity. – [r] Yeah. I love what you said about the the event almost it's self being neutral and then the meaning we assign to it can either create stress or not stress depending on how we interpret it in some cases.

That's an interesting concept. Yeah. Backing up a little bit. You mentioned biological aging. Can you define that? And versus maybe chronological aging.

Stress, Mindset, and Perception

And then also what are what are your go to tools to measure biological aging. It's an area that's evolving very fast now. – Yeah. Well chronologically we're getting older. We can't do anything about that.

I was born in 1959 and every day I get chronologically older. The question is, how was my biological age Progressing or not? And I recently tested my biological age. I'm 63 and I'm biologically 43. So I think that really interesting phenomena that we can actually get chronologically older as we get biologically younger.

I tested my biological age to a technique called DNA methylation which is really relatively new type of test that measures are epic genome, which is the really the piano player that plays the keyboard which is our genes.

And that determines our health or determines our level of disease or rate of aging. And so we have enormous influence over ePI genome. We can change our genes are fixed unless we do gene editing CRISPR but we can change the expression of our genes by what we eat by what we think about how we move by our environment by toxins or removing them by the level of nutrient density, our diet by how we manage stress. All these things are read in the book of Life and when we read into our genes and so we have enough power at any age to transform that.

And a lot of the research around longevity now is focused on the epi genetics of aging and how we can modify that through our environmental lifestyle.

And that's really where the hope is that a lot of the things that we see as normal aging are really abnormal aging. – [r] Yeah. I wonder do you see um you mentioned that DNA methylation sort of the epigenetic clocks. Really popular sort of in longevity.

Do you see those assuming a clinical role currently? – [m] Absolutely. I mean I use them. I use them in my clinical practice. Absolutely. I think you know there are many ways to measure our biological age that are not a true biological age, but are indirect indicators which we do all the time.

We measure cholesterol in your blood sugar, your blood pressure, we measure your hormone levels and we measure your nutrient levels. And there's all kinds of ways we can look at your biological function and see where you are on the spectrum of wellness to disease. Right?

So that's what functional medicine is really good at. But what's really exciting is these new technologies that have been able to measure things like DNA methylation or telomere length or telomerase activity, which are more

reflective of the rate of biological aging and our metric, which can be used to assess how you age and how what you're doing affects how you age.

And so let's say you start on a lifestyle or diet program or uh supplement or medication. How do you measure your rate of biological aging? Well, now there are tools and techniques to actually do this clinically which can help you identify whether you're on the right track or not.

So this is what I do myself. And then with my practice. For sure. – [r] Very exciting time. – [s] Yeah. So, I'm wondering if your, was this the baseline reading you took where you found out you were 20 years biologically. – [m] That was my first my first try.

– [s] First try. – [m] I'm going to try to get to 25. We'll see how it goes, but I'll keep you posted. – [s] Well, I know in in your work food is very important.

In fact you said food is the most powerful drug on the planet as a psychologist and knowing about addiction and drugs that resonated with me because I know we can use drugs in a good way, can use drugs in a in a bad way.

So how is your what is your perspective on that?

Measuring Biological Age with Epigenetic Clocks

– [m] I think, you know, we we underestimate the power of the molecules and information of food to regulate our biology every day. We don't almost think twice about what we're eating except for the taste good. Or how does it make us feel in the moment?

You understand that we're not eating this for energy or pleasure, we're eating to regulate every single function of our bodies. It's the most important thing we do every day to interact with our world.

And and it's transmuted into biological signals that control every aspect of your health, your microbiome, your immune system, your energy system, how you make energy in yourselves, your detoxification system, your circulation, blood vessel, help your hormones and communication systems and our transmitters, your structural system. What you're made of all these things are influenced by food and they regulate so many different functions of your body.

So when we see chronic illnesses, I'll just tell you a quick story about, you know, the power of this is in my book Young forever. I shared the story of a patient who came to Cleveland clinic that 66 years old with the body mass index of 43 minutes. Really, really obese.

She, you know, basically normal is 25 or less. 30 is obese, 40 is severely obese. She attempted diabetes for 10 years on insulin. She had heart failure, she had kidneys for failing her liver was failing, blood pressure was high, she had multiple stents put in her heart and was on a pile of medications and was not doing well, even though she was having her do these managed by the best doctors in the world. They were doing the right thing according to our current paradigm. And rather than trying to tweak her medications or adjust her dosages, why don't we try a different approach?

And she joined a group, we have a Cleveland clinic called function for life was able to actually transform her health very quickly using food. And she radically changed her diet from eating ultra processed, who died those high instructing sugar to whole foods, low glycemic, anti inflammatory, low sugar starch, high higher fat diet.

And within three days she was off her insulin in three months. She reversed her heart failure diabetes for a one C. But you know, your doctor. And you know, it was 11, it went to 5.5, which is, you know, unheard of if you have a medication that drops it by one point, it's like a blockbuster drug. And we're talking here about Six and their points and its algorithmic. So it's not linear point and she reversed her heart failure again. Something we never see in traditional medicine diversity, kidney failure again. Never something we see in traditional medicine or liver. The liver resolve her blood pressure normalized all her medications. Her copay was $20,000 a year.

She got everything most £43 and three and ended up losing 100 and £16 a year and completely reversed. Everything is 66 years old. That that's the power of food. There's no drug that works as well as that.

There isn't. If there was, I would prescribe, but I have no righteousness about medication or pharmaceuticals. I use them all the time. The question is, you know, what's the right drug for the right for this problem?

And 90% of the time – That such a powerful story, Mark. I wonder. And I've heard that in other settings as well, how these chronic diseases which were treating the symptoms of with drugs and surgery, the root cause can be reversed with lifestyle changes and particularly food as arguably the most powerful one.

I always wonder. And I'm I'm still involved at medical school now, teaching people and I see what's going on. I see what's being taught, Why aren't people shouting this from the, from the raptors? That, you know, we've got a cure or not.

We've got a – [m] I mean, I think five has just announced that it uh, increase the price of Covid vaccines 10,000% now. This just doesn't make any sense, right?

Food as Medicine and a Reversal Case Study

And I think we're we're in a profit driven healthcare system that often ignores the simplest, most effective and inexpensive treatments in favor of things that actually don't work that well.

And that cost a lot and have downstream negative consequences. So I think, you know, we have, we have an antiquated healthcare system, we have an antiquated medical education system. My daughter's in medical school right now, and it's just, it's staggering to me what she's not learning.

You know, it's like, you know, by the time the textbooks written, it's outdated, but the truth is that most of our textbooks not just outdated, it's like we're learning about the world is flat and the world is round world and I think that's really you know, it's really criminal given the level of understanding we have now about biology, the entrenchment of our health care system and the old medical paradigm is really frightening. It sort of reminds me of Semmelweis who discovered that washing hands could prevent childhood fever and the death of his patients in labor and delivery. You know, he was ridiculed for thinking that and was banished from medicine and end up dying.

You know, just in disgrace. And it took 50 years for doctors to go, yeah, I guess we should wash our hands before doing surgery. You know that's kind of where we're at now. – [r] I certainly understand the pernicious incentives and the financial motivations from the drug companies and all the fact that are lining up. But I mean what about the young medical students that are idealistic? They're just not being taught.

I mean are they maybe not exposed to this? – I mean they're trying to themselves. My daughter's like, hey dad, there's a food as medicine study group at my medical school, the students put together in my Yeah, okay, great.

And that should be part of your curriculum. It shouldn't be something you have to do on the side. – [r] Right. Right. Yeah. I mean I love your quote that every bite of food you take is like instructions that control the operating system of your biology.

I think it's sort of like somebody else said is the way we program our epic genome is with each, each piece of food we take is programming our epa genetics for better or worse, you know, depending on depending on the food we take.

– [m] Yeah. Absolutely. Absolutely. – [s] So you talk about Hore missus, can you explain what it is and how it can be activated? – Yeah. So, you know, one of the exciting things about our understanding of biology that we have an innate immune and healing system. We have an innate system that is designed to rejuvenate repair and fix our biology and it's activated by stress.

And historically we lived in a world where we were constantly exposed to different kinds of stresses, heat stress,

cold stress, hunger stress, exercise stress.

And it turns out that these kinds of stresses actually help us. If you are in extreme stress for too long, it will kill you, right. If your body is immersed in 40 F water for too long, you'll get hypothermia and die. But if you do it for three or four minutes, it activates your body into a response that creates healing journey.

Immune system activates your brown fat increases dopamine increases focus energy, helps your metabolism in many ways. So there's so many benefits to um to these different kinds of little stresses that we have insulated ourselves from.

So for me this is the idea that we should we should practice little stresses every day to activate our body's own healing system. So what are those kinds of stresses?

Well, first one is diet and what you're eating and how you're eating and when you're eating and what you're eating. The easiest form of performances is just taking a break from eating for a little bit and I'm not talking about fasting for a week.

I'm talking about 12 hours, which most of us don't do we eat. We go to bed and wake up. So taking a 12, 14 hour, even 16 hour fast every day overnight fast, which means eight of those hours are sleeping.

It's not so hard to eat dinner at six at night. You can eat in the morning. That's a 14 hour fast right? That that creates a little bit of stress and starvation in the body. That then activates the body's own repair systems called autopsy, which means self eating or cannibalism that helps your body recycling repairable parts and cleans up both ways. And that's really important for longevity and for healing the body. And then what we eat is really important.

There's a whole world of science around the horn uses which are the plan compounds of phytochemicals and planets that actually combined two different receptors and pathways that create a little bit of a stress, like a little bit of a toxin that activate these ancient and built in systems that enhance longevity and reverse biological aging.

And then there's other stresses that we can easily do like take a cold shower for two minutes in the morning. Get a cold plunge which make a little more expensive. But are you just get like a some guy got atrocity by for next to nothing in the animal feed store filled with water and ice cubes and you know it's it's in that sauna again, another powerful way to increase our our stress, our body from heat stress that creates heat shock proteins that help repair damaged proteins that helps activate our native immune system that help our bodies reduce inflammation and improve our our ability to reduce stress in our systems and have a really powerful effect.

And sauna users, for example in Finland live, you know, you have a 40% reduction in desperate. It's because of using saunas for example or or we can do you know, other forms of exercise. That's a great form of music where we stress our bodies when you weight lift you tear muscles and that's a form of injury or stress to the system. And then you build back stronger.

Same thing with with interval training where you do high intensity interval training where you run really fast for like a minute and then you're gonna run from a tiger but then you rest for three minutes slowly walking that you do that for half an hour and repeat.

Why Medicine Ignores Lifestyle Interventions

And that activates something called improvement in your Vo two max, which is really critical for longevity. And it's again another beneficial stress. And then there's you know, other kinds of stress like hypoxia.

You can get the breathing mask for 50 bucks online that you can use while you're sitting at your desk. That limits your full of oxygen and use that for a period of time to create hypoxia which causes in um you know, reducible hypoxia factors which are again reparative.

We can also use other forms like hyperbaric oxygen which has been shown to kill zombie cells which are part of the

aging process. That spilled inflammation, inflammation and that increase your telomere length by using hyperbaric oxygen, which is a basically a pressure chamber where you are basically under the water, two atmospheres equivalent to at of pressure. 100% oxygen, which is a stress for the body. And that creates a healing response.

Always known as another therapy. So there's many of these kinds of therapies that are available to as some are easy to get to and some are a little bit more challenging, expensive. But they're but they're around and those are the kinds of things that really activate your body's healing system.

So I make sure I activate some type of promises every day. – [r] What is it about the stress or the exercise of the event that takes it from beneficial to harmful. Like a little bit of stress is beneficial, but chronic stress is harmful. A little bit of exercise.

I mean, moderate exercise good, but too much is harmful. What's the difference? – I mean to paraphrase the Paracelsus, the dose makes the poison. Right?

So I think you know, you've got to find that goldilocks version of the stress. If you again stay in the sauna too long, you'll die of heat stroke, You stay in a cold place too long. You'll die of hypothermia.

You have oxygen hypoxia too long. You'll you'll, you know, run out of oxygen of you in a hyperbaric chamber too long. It'll you'll get oxygen toxicity from being too high oxygen state.

So, I mean, it's just really about finding that perfect dose of you don't eat for 16 hours or 24, hours, you're fine. If you don't eat for a month, you're dead. So it's really about finding that goldilocks version. – [s] It's what we call the inverted U shaped curve, which is a very common relationship where you need a certain amount of whatever the stimulus is to activate. But then if you go too far past it, then you bring that curve back down. So stressed and performance, the challenges that you're talking about, you want to challenge the body is what I'm hearing, but you want to do it within a certain framework where you're not overloading the body. – [r] One of the the emphasis of this program is on inflammation, itching and inflammation. Could you talk about how inflammation drives aging or how how the hallmarks of aging are affected by inflammation?

– [m] Yeah, well, you know, first of all, you know, inflammation and we're all familiar with, it's this process where there's pain and inflammation through which leads to swelling and heat and uh, you know, it's sort of the classic signs of inflammation.

But what's really going on is more sterile chronic inflammation in the body and seeing all the diseases that we see today in the world from depression to cancer to obesity to diabetes, heart disease, autoimmune diseases obviously and more and and the and these are all driven by the underlying factors that are driving information.

Hormesis and Beneficial Stressors

Our diet for inflammatory diet high in processed foods are sedentary lifestyle are chronic stress levels, environmental toxins, changes their microbiome.

All these things are driving inflammation and and so that has a Mass effect throughout the body. And as we begin to understand the process of aging, scientists talk about the hallmarks of aging and let's say there's nine I say there's 10 night the microbiome but essentially these are all things that go wrong as a result of various insults in the body or insults to the body or lack of certain things.

We need to thrive like good food and sleep and the right nutrients etc. And so inflammation is kind of a common unifying theory around a lot of this and all the hallmarks of aging are both caused by and can cause inflammation.

So they're really inseparable. And the hallmarks of aging are I think you might or may not be familiar with their things like damage to our D. N. A problem that epic genome mitochondrial injury proteins that are messed up and not folded properly or injured problems are nutrient sensing systems. This is one of the central features and it also drives a lot of information which is how we regulate our responses to proteins and sugars and things in our diet that

regulate the aging process.

So too much sugar and starch, which is the predominant source of our calories and are died today, drives these inflammation pathways And that makes this process of inflammation inflammation worse. And so, you know, we have all these ways and even the microbiome, you know, there's a huge source of inflammation because of our toxic diet and that affects our microbiome and that creates changes in the rest of our biology that drives information. So inflammation from aging is is this common unifying theory, But it's both the cause and the and the effect.

It's both causes a lot of the other hallmarks of aging, but it's caused by a lot of the other homework. So it's really one, I mean it's not really good to call them all separate.

They're really one interlocking set of problems that if you deal with the root causes upstream to the hallmarks of aging, you deal with all a lot of science now around longevity is focused on treating the hallmarks of aging, which I think is a big improvement.

And seeing aging as a disease, which I think is a big improvement, but it doesn't really address the underlying phenomena that the hallmarks of aging have a cause. Right, what is the cause of the cost of aging?

And that's where functional medicine comes in the framework of understanding uh what you're basically dying too much with. Too much of or too little of your dying to too much bad food, too much dress too much toxins too much, you know allergens? Microbes et cetera and you're dying of too little all the right things too little of the right nutrients and the right high quality phytochemicals rich diet and right amount of sleep and movement and etcetera.

So really functional medicine helps us get the causes of the causes and that's what's so important. That's why it's such a radically different approach to aging. – [r] You mentioned how important and powerful nutrition can be in decreasing inflammation and certainly the role of avoiding sugars and refined carbohydrates. Starches all those things too to decrease inflammation. Do you think following a diet that lowers though? Is there any additional value for being in ketosis where you've actually switched your metabolic switch to fat burning?

– You know? So there's a lot of ways to activate or missus right? Which is this idea that you know sort of mimic starvation. So we know from the research that the only thing that really extend the life in animal models is calorie restriction because if you need a third less calories you live longer. So that's like 100 and 20 years old.

But no one's gonna want to do that because they're gonna be hungry and irritable and have no sex drive and be frail and like it's not a good thing. So the question is you know, how do we how do we activate or mimic calorie restriction and that's where we talk about time restricted eating or intermittent fasting or a fasting mimicking diets and ketogenic diets are another form because historically, when we ran out of food, We you know, we have about 2500 calories, which is basically a day's worth of calories. And our muscles stored as glycogen carbohydrate, we probably have 50 maybe depending on you are 100,000 more calories stored as fat on our body.

And that can when our body can start to break down that fat, it can use that as fuel. The body is like a high the car can run on gas or electric. Gas was like dirty burning fuel carbohydrates and that is clean burning fuel like electric. And so when you need a ketogenic diet which historically we didn't eat meat doses. When we're kind of hunt and gather, we didn't find something to eat, we shift into this state of or missus which activates our body in the same ways as these other forms of starvation.

So we end up activating our anti inflammatory system. DNA repair systems. We silence them. Tour, we increase autopsy gee, we fix our mitochondria, increase mitochondrial biogenesis.

We do all these things that basically create health as a consequence to make us stay alive. So we kick in all over repair and healing mechanisms when we do that.

Now. The question is, do we say, he tells us all the time, is it good to be on all the time. And I think from an evolutionary point here we never were we would eat and then we would starve and we eat and we start so I think it

probably cyclical ketosis is not a bad idea or any of these other techniques.

And we're still trying to thread the needle on what that is. And there are drugs which are making that like being studied for longevity. But I think we're still in the early stages of trying to figure all that out.

– [r] Yeah, I wanna talk more about rapamycin and m taurine in a bit. But before we leave the before we leave the nutrition part, I think. Yeah, the consensus is pretty strong about sugars and and refined carbohydrates. You know avoiding those to drive inflammation. There there are a couple other things I wanted to get your take on is some people also in addition to avoiding refined sugars and refined carbohydrates and sugars. They also avoid what are called seed oils or uh industrial oils, canola oil, you know, Rapeseed all those things as as drivers of inflammation.

How do you feel about that? Is that important to do or?

Inflammation and the Hallmarks of Aging

– [m] Yeah, I mean I think you know the problem is you know, we always consumed these oils but in their original state, right? We eat the beans or the seeds or the nuts or sources of these oils that were found in whole foods, what we've done, you know, in the last 100 plus years, we've, we've invented this refining process, probably pressed and extracted heat and solvents in these oils from various complaints that are really kind of unknown to our biology in the sense of soybean oil has increased a thousandfold in its consumption in the last 100 years.

So that when you see something like that, I'm like, you know, does that really good for us? And I think, you know, in general a little bit, it's not going to be bad.

And many of them are observational studies show that it's good for you. I think there's a real challenge of nutrition science. It's hard to do good experiments with people and good experiments because you can't lock 10,000 people up for 30 years in a room and another 30, another 10,000 people in the room and feed them to different diets and see what happens.

Which would be the best thing to do, which is, this is never gonna happen. So we're gonna have to extrapolate. And that's why there's so much nutritional confusion and literature personally. I think that uh you know the main oils, you should be consuming our olive oil, um extra virgin olive oil, avocado oil, which is an oil that's more mono unsaturated.

It's a higher temperature heat, some coconut oil depending on your health and lipids and your genetics. You know, you some more saturated fat and I don't think it's the boogeyman that was thought to be so coconut can be helpful.

Animal fats typically are refined for most people. I think, you know, the whole idea of cholesterol and animal fat, that's been really well debunked in the literature in terms of cardiovascular effects.

In fact, there there are trials from Sarah Hamburg and others where they put type two diabetics on ketogenic diets, basically basically butter and you know, and coconut oil and other fats and high super high fat, 70% fat diets and everything. One of the cardiovascular biomarkers got better or more neutral. So I think there's really good evidence that interventional trials that there's really little harm, especially in meta mafia and healthy people. So my personal opinion is I don't consume those oils. I avoid them.

They're ubiquitous and processed foods. We don't actually even think we're consuming them. We use them in our kitchen. People do vegetable oil, corn oil, soybean oil, canola oils, all these oils. I typically stay away from them and I think I consumed them in their whole food forms. I think we do need them.

And the people I've seen have extremely high imbalances in omega three and omega six when you have too much omega six, it can in create problems with the function of the omega three fats. So you kind of way invalidate the omega three fats. So it's not bad to have omega six as we need them. They're essential fatty acids, but it's just throughout really the right ratio and balance. – [r] And one last food question.

One other area people talk about is grains and you know, even people who don't have full blown gluten intolerance or celiac disease, do you recommend avoiding grains themselves, whole grains or any kind of grains as drivers of inflammation? – [m] I mean, there's two questions there.

You know, you have celiac disease, you should definitely avoid gluten That. There's no question about that from anybody in medicine, grains as a whole are not all gluten grains, you can eat black rice, you can eat, you know, buckwheat and amaranth, quinoa. And these are all ancient grains.

That can be helpful. However, when you are metabolically very unhealthy, which is about 93% of Americans. The more even of these helpful grains that we consume, they can be problematic. So one of the things that's emerging that I really think it's fabulous is the ability to monitor our own biomarkers in real time.

So now we have continuous glucose monitors, you can measure your blood sugar and so you can stick a little thing on your arm the patch and have this continuous read of your blood sugar and you can see if I eat a cup of rice, what does that do if I eat a cup of tea?

No, what does that do? So some people can tolerate it. But other people, it is a problem. And for people who are in the extreme ends like type two diabetes, I don't think they should have any grains or beans until they're able to reverse their type two diabetes and then they can broaden their diet.

So I'm not extremists. I do think in certain situations you need a more aggressive approach and that may include limiting brain than. – Thank you. Thank you.

We're we're talking about what can impact our biology. We're talking about her missus and different challenges. But you've also talked about the power of community and love to actually change our biology. Can you expand on that?

Nutrition Strategies: Ketosis, Oils, and Grains

– You know, there's a whole new field emerging that it's called socio genomics which is understanding of how our social connections and interactions influence our gene expression and we know from these from these data points that that if you're lonely or isolated or disconnected, don't have physical touch or community that you're you age faster that you die sooner. That is an extreme high risk factor for all kinds of diseases and death and that if you have community and you have connection, you have meaning and purpose that you live longer.

And so it really we understand not only just listen from a population may study perspective but actually from the mechanistic perspective and you know, I traveled to Sardinia and Korea as part of the blue zones.

My friend Dan Buettner introduced me to people there, I got to really see inside these people's lives. And you know that deep sense of meaning and purpose connection and community, they're not stressed all the time and busy all the time and I just want to sit and chat and hang out and enjoy each other, enjoy life. And it's like we we kind of missed that in the sculpture. We're always like driving, going, doing, being productive and rather than just being and enjoying life.

So I feel like you know, we're in a very interesting moment where we need to kind of rethink our our values as a society and start to bring back some of those values of community and love and connection. – [s] Yeah. So that it sort of resonates with my model of resilience where relationship is a very important component as well as having purpose in your life. So it fits with what you're saying.

– [r] Yeah that's so important. Well maybe I can, I can go from love and community and kind of go back to another question, What are the most promising longevity compounds and from a functional medicine doctor.

– [m] Yeah. – [r] What are you excited about? – I mean honestly food. But I think within food there's a whole a framework of understanding these phytochemicals and this whole emerging field of Fido or missus which is the idea that within the plant world and even within animals who eat those plants when you eat those animals or their milk or cheese actually contain these very powerful compounds from nature that we co evolved with the regulator

biology.

And you can have really remarkable effects for example like seating and strawberries, which is a compound that that seems to activate many of the positive nutrient system pathways that we want to activate properly when we want to think about longevity.

For example like like analytic um processes which we kill we kill the zombie cells or we increase autopsy ji or we decrease inflammation through inhibiting NF kappa B or we increase mitochondrial biogenesis and function meaning we use our energy system function. These compounds really do that and they're making green tea from grape skins are still being which is another compound curcumin.

You know one of my favorite compounds is something called um of course Satan and some of the bio flavonoids that are found in Himalayan buckwheat as a plant which you can eat the pancakes or not or as a supplement. But in that there's something called to hobo which is an amino rejuvenating compound that's found nowhere else in nature.

Big both health makes its different plant. My mentors founded that company and so there are all kinds of these magical compounds in food uh that we can use from green to deconstruct human. And he's real promise and I intend to consume these foods as much as I can, I tend to take supplements with them in them.

But then there's the whole cost of pharmaceuticals that are being explored. And you know two of the most promising ones have to do with regulating two of the nutrient sensing pathways that are part of one of the hallmarks of aging.

M. Tour and M. P. K. And one of them is called uh It's a compound that was discovered in Rapa Nui In the 60s up in Easter Island where they have these weird statues and they think aliens brought down or something. I don't know how they got there.

But they found that on the back of the statute that this compound that we thought maybe it was a fungal or had other properties that was good. And they kind of maybe it was helpful and transplant medicine for immune modulate. And but then we discovered it regulates this ancient survival pathway called which is needed to build muscle protein synthesis but also it needs uh to be silenced at moments to increase autopsy which is the recycling repair system we talked about. And so this drug which is named after avenue we advise this receptor called which was named after the drug called million target of rapamycin uh actually seems to extend life and animals and verse a lot of the biological signs of aging and hallmarks of aging. So should we all be taking wrap a mission?

Probably not. I think there's still a lot of research needs to be done. There's a lot of questions about the dosage and safety frequency, the timing. There's there's a lot of companies.

I just talked to the ceo of one of them today who uh are creating rapid mites and analogs that may be better with side effects. So that that's a really exciting compound.

I think uh another one is Metformin. I'm a little dubious about it. And it works on a pathway called M. P. K. Which regulates some resistance and use for diabetes.

Community, Love, and Social Connection

But you know, all the studies I've seen, you know on Metformin is that, you know, it actually, you know, works but it doesn't work as well as lifestyle. So it's like people like oh I'm gonna take this drug and I changed my diet. Well, no, I mean in the large diabetes prevention trial over 1000 people, they found that uh people who lived a healthy lifestyle and it was actually a really crappy diet for diabetes was a low fat diet, but they had other supports and exercise and group meetings and You know, healthier food. But it was low fat, which is not the right guy for diabetics. It still was far better than the foreman and and nothing. So you know, there was a 58% reduction in progression diabetes with people doing that versus a 31% reduction with performance.

So you know, even and for example would do a study on the like Sara Hulbert's work and you know, you look at Maybe a 60% reversal of diabetes, not just prevention, they 100% reduction in some of the main medications and 12% weight loss.

It's just staggering numbers. If you would use that kind of diet with these people, you'd see probably, you know, metformin would look like it barely had a blip on the graph in terms of so I kind of, I'm a little dubious.

There's a big truck going on detaining trial which is coming out. It doesn't it's not without side effects. It does have some adverse effects on mitochondria. So I kind of don't like the idea that I put myself I'm more optimistic about. But again, I think there needs to be more research and maybe the use of some derivative compounds that don't have the side effects.

But I mean, the longevity research is just accelerating at a rapid pace – [s] You mentioned m tour. And how do you reconcile the need as we grow older, to silence enter with Also the need to maintain grow muscle.

– Yeah. So this is the thing, you know, you've got this pathway that's essential for building muscle, which is the currency of aging and which means lots of muscle is really what people die from like from frailty and weakness and the metabolic consequences of replacing muscle with fat even if your normal weight as you get older.

So keeping your muscle madness is critical as you get older. You know, but it's also important to increase on top Aji which is the ability to buy the recycling, repair and clean up old parts.

So we both need the demo team and the construction team right?

Promising Longevity Compounds and Rapamycin

And it's got to be a balance. So a lot of people say always should be being because you want to silence senator and you want to pass all the time and like well no, I mean you you need times where you're actually building muscle and many times where you're not.

And so within the course of a day it's not that hard to do. You just you know do a 12 14, 16 hour fast right overnight fast and then you work out and then you have a load of good quality protein that activates M tour for muscle synthesis and it's the surest way to maintain and keep your muscle and then having adequate amounts of protein throughout the day at each meal. With the right amounts of Lucy, now Lucy is an amino acid that sound more animal protein, low plant proteins and you know, you have to eat a ton of plant protein. The equivalent in terms of its Lucy and branched amino acids which are critical for protein synthesis.

So people who just don't understand this well you can get all your protein from plants. Well yes, but you you know you have to have six cups of brown rice to get the equivalent of four ounces of chicken. Nobody's gonna need six cups of brown rice, so or two cups of beans. So I think you just have to be realistic about the dose and the quality of the protein and you need to modify your diet as you get older.

And even even studies that may may suggest that having lower protein when you're younger is better. They all show that when you get older it's not, it's really important to have high quality protein and the protein study, which is a big survey of all the science on protein and aging and muscle mass encyclopedia by leading aging researchers, leading protein experts in the world, all came to ST we need not just 0.8 g per kilo, but we probably need 1.2 to 2 g per kilo depending on the level to build and maintain muscle as we get older and yet, you know, we have to again also give breaks and activate autophagy And there may be compounds like rapamycin that we can begin to take that actually accelerate the autophagy and kind of thread the needle little bit so it's kind of an exciting time. But I think people need to understand that it's you can't go extreme one way or the other.

– [r] Are you using rapamycin with your patients or in your group? Currently – Not. Not yet, no, I think it's still too experimental. I mean there are bio hackers who are using it.

There are leading aging researchers are taking it, You know, I think it's definitely very fascinating, but I think it also

has side effects. So I think, you know, it's a drug, it's like it's like I say, eat lots of strawberries from, you know, wild strawberries which are high concentrations of and you're not gonna get in trouble doing that, right?

– [r] No yeah, well, we're almost out of time. Is there anything we haven't talked about that you're particularly excited about that we need to need to cover here.

– I think the message I would like people to take home is that is that, you know, where this is really exciting transitional point medicine or for the first time we understand the laws of biology and how to activate our body's own healing system and it's not by treating diseases. By creating health and functional medicine is the framework for doing that. My books young forever.

The secret living your healthiest, longest life is really packed with the science of how this works and what's at the root cause of aging and the root cause of the hallmarks of aging.

Balancing mTOR, Muscle, and Autophagy

And give you a very practical sense of tools and a pathway a roadmap to follow that actually will help activate all these healing systems and reverse the biological age.

– You know, we usually end by asking you one or two what things that people can do to improve their longevity. But I'm so pleased that you've been giving us a whole menu of things throughout talk. So that's that that's really great.

I really appreciate that. How can people reach you if they wanted to learn more about your work? – [m] Well, they can find me my podcast, the doctors pharmacy with an F My website is Dr. Mark Hyman.

I'm sorry drhyman.com. And on social media it's just Dr. Mark Hyman, D. R. Mark Hyman and they'll have more than enough of me. – [r] Great, well thanks so much, Mark for taking an hour to spend with us in our audience here and and thanks also for the great work you're doing in this field.

It's it's really been a pleasure. – [m] Thank you so much.