Muscle Is The REAL Organ Of Longevity! Here's Why … l Dr. Gabrielle Lyon l Ep #407 Transcript

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Introduction to Muscle and Longevity

I'm Natalie and I am your host and we are back with none other than Dr. Gabrielle Lyon, who is on a mission to move the longevity conversation beyond weight and toward muscle and not just how much muscle, but muscle quality.

With training in geriatrics and nutritional sciences, she explains why intramuscular fat, that marbling that you look for in your steaks, is exactly not what you want in you own body.

This is not about the number on the scale. this is what drives metabolic dysfunction and why there's really no such thing as a healthy sedentary person.

We also talk about muscles role in brain health and inflammation and why building strength is one of the most powerful things you can do at any age. It's never too late, people.

Never too soon and never to late. Now this episode is brought to you by Cozy Earth, by Oslo and by Trank Dart by Wizard Sciences, all with very special offers just for you, the listeners of this show.

Check out the show notes below for details and enjoy the Dr. Gabrielle Lyon, welcome to the show. It is absolute pleasure to meet you. Thank you so much for having me.

Yeah. Well, you know, your, one of those people, it's like, I got to get her on the Show. We got a, we need to have that conversation and you've just emerged as such an incredible beacon for women and not just women, but muscle.

as as that one as the longevity organ of longevity, which I think is just the whole concept of it. I Think when I first heard about it, I was like, you articulated something that maybe we all kind of deep down inside as soon as you started articulating was Yeah, it is.

And we're going to dive into that. But before we do that, I want to just kind of go back a little bit.

Childhood, Discipline, and Early Grit

You often describe your childhood and early years as unusually formative for how you see responsibility, grit, and personal agency. So looking back, was there a moment that most shaped your belief that discipline is a form of self-care and not a grit your teeth and get through it kind thing?

I think that there wasn't any single moment. My sister and I, we were chatting, were actually just recently on a podcast together. And we're talking about, my dad used to take us on camping trips.

For most kids, like, oh, that's fun. But when I say camping trip, I'm talking you about 13 milers where whatever you're going to have, you are going pack it in there.

I was like real camping. Yeah. when things were too heavy for my sister, she would unload the backpack and I would pick up her stuff and we would share and disperse the weight.

And this was just part of our childhood, being very physically active and understanding our surroundings. I will say that that shaped me a lot. I would say that that shaped me a lot.

And both, you know, my sister, she's actually a professor in criminology. Whoa. Okay. She's a brown belt in taekwondo and a state running champion. Nice.

Wow. Well, but you, know that, that's about doing hard things, right? That, and I find I think one of the criticisms of childhood these days is there's maybe not enough hard stuff that's being put in front of kids when they're small.

We're trying to protect them so much. Yeah. I actually totally agree with you. And I would say that, um, even in the conversation of doing hard things, it's not typically a female conversation, which by the way, women do a lot of hard.

A lot at a time. It's almost expected. you know, maybe we don't think to say, you now, hey man, You've got two little kids. You're doing X, Y, and Z. That is way outside someone's comfort zone as opposed to, there's a whole other entity where people are like, oh, lean into the discomfort.

And I'm thinking, I have two kids, my husband is in a second career in urology residency. I am already uncomfortable. Oh yeah. Yeah. Love it. So you trained under Dr.

Donald Lehman, who is the world's leading protein scientist, and the protein wars continue to rage. It's shocking. Shocking. But what drew you to him in the first place?

What was the thing? That's a good question. And Don still mentors me to this day. I did my undergraduate in University of Illinois, Champaign-Urbana. And I think we've all had the experience when we're listening to someone talk and it's outside the norm and you think, wow, this guy is an absolute genius.

And that was him. I went to every office hour. And we just got to talking and I was very interested in this idea of muscle and very interesting in the idea and the role of protein and thinking about it differently and think about how muscle really shows us our health, right?

Not just this training way, but how, say, a doctor looking at blood work would begin to think muscle, and what its role, its central role in metabolism is.

And 20 years later, he's still my best friend and mentor, which is wild to thing about. That's amazing. Well, I mean, that's a lifelong relationship, right?

And you could have gone to door number one or door, number two door. Number one, this guy's nuts. Nothing he says makes any sense. And door Number two is this guys brilliant.

In many ways I would think that that kind of shaped your trajectory. No, it fully shaped my trajectory and the other person, which maybe that the person that introduced us is, do you know, Liz Lipsky, Dr.

Liz lipsky? No. But I know the name. So she's one of the OG functional medicine doctors. She's a PhD and she is a nutritional scientist. That's my godmother.

Oh, so this is in your DNA, sister. Yeah, this door number one, door, number two, it's kind of like, okay, here's the door you're going to be going through.

And I happily charged, happily charge. There was really no other way. Truly. Um, there was no way I feel a really big responsibility. I think that if someone has the knowledge, then they have a responsibility to share.

Most people, um, I was just lucky to have really unique training.

Protein Science and Mentorship

I did my fellowship at WashU in geriatrics and nutritional sciences, and that was really because Don said, if you wanna do the kind of work that you want to do in the world, then you need to go and do a fellowship.

And I think that there's a really heavy responsibility there. Yeah, well, I mean, on the geriatrics and nutritional side, you would have witnessed the fallout of people not prioritizing.

I'm going off script here, but do you think, as we're talking, shouldn't muscular load assessment be part of an annual checkup? Well, even beyond that, beyond muscular load, testing muscle period.

So, I don't believe that body fat is as relevant as a biomarker as we make it actually. Percent bodyfat, it's almost a secondary outcome, but I think it is the percent of fat in skeletal muscle.

that actually drives chronic illness. And this came from another flash of insight I had when I was interviewing on my podcast, a woman named Dr. Melanie Cree.

She's an MD, PhD. I said, Melanie, what percent body fat is the tipping point for those that struggle with fertility with PCOS versus those who don't?

And she said Gabriella has nothing to do with body percentage. It has everything to with intramuscular fat. and how high their intramuscular fat was. Wow.

So be a filet, not a rib eye. Well, I mean, you know, a good rib-eye, but I'd rather eat it than be it. But that's interesting. I don't think I've ever talked about that on the podcast before.

How does intra-muscular It would, you would almost think that it's sequestered in the muscle and, and therefore not do it creating trouble. You're saying it has, it playing a major role.

I believe that. It is. We're still too early in their research. And also we don't routinely measure it, but basically sedentary muscle. There's no such thing as a healthy sedentar.

Right. When muscle becomes sedenta, there's, no flux. No exchange. And fat, we talk about visceral fat and then we talked about fatty liver, but fatty muscle is a thing.

And whether it's liver is the first arrangement or muscle, the primary site for disposal for all of these extra substrates, primarily carbohydrates, is muscle first.

If the muscle can't handle it, then the liver has to deal with it. But the fat that gets infiltrated into skeletal muscle changes the morphology of muscle.

And it becomes less strong and fibrotic over time instead of this, again, this filet. There's connective tissue changes, all kinds of things happen, and also metabolic changes.

Wow. If your body by percentage is 40% muscle, if 40 percent of your weight is inflamed, you've got a problem. Hey, folks, I just wanted to throw a little message in here for those of you who are sending me all these incredible questions on social media or through YouTube or even on Spotify, wherever you're listening to the podcast.

I wish I could get back to each one of your personally, but unfortunately, And because I cannot, I created, about a couple of years ago now, a membership community where I get to hang out with people just like you.

I do live weekly Q&As, almost weekly anyway. We also do have podcast guests come in to answer everybody's questions and do presentations, you get to interact live with those podcast guests.

We will sometimes do challenges with some of the partners. Like in 2026, we have a mitochondrial enhancement challenge coming up where we're going to be testing mitochondria function.

we are going be to testing people's deuterium levels. If you haven't heard about deutereum, We've got podcasts coming down the pipes on that. And then people will be invited to follow a personalized protocol and then retest their mitochondria on the other side.

We offer that in the membership community and we do it at incredible discounts that you just can't find anywhere else. So if you're interested in hanging out with me and other like-minded people, which actually happen to include some pretty awesome practitioners and even some previous podcast guests who've come and joined the community, then I invite you to check it out on my website natnidam.com slash the dash longevity dash community or just go to natnim.

com and look for the longevity community tab at the top of the page. Click on that and see if this is right for you. I would love to see you there. and we could make 2026 our best year ever together.

So once again, that's natnidham.com. Just look for the Longevity Community tab at the top of the page. Now let's get back to the show. What's a belief that you held earlier in your medical career that, you've now come around to?

Oh boy. I say this with some level of difficulty. So number one, that body fat, one couldn't have obesity and BFIT, so that was wrong. And then this intramuscular adipose tissue, you can reduce it by the simple act of training, whether body composition changes or not.

That's very empowering. This idea that just a simple active doing some kind of physical activity changes things, regardless of outcome, is important. The other thing was animal and plant proteins.

I was convinced that you couldn't build muscle on plant protein, and that's not true. Okay. Well, that' interesting. Tell me. But it's still not a prime.

Muscle Quality, Sedentary Health, and Metabolism

Again, it' not just a protein conversation. It's what about B12? What about the B6? what About the protein matrix? It' just here, drink your protein as this obscure kind of solution.

Well, it's why EAAs will never really replace full food protein. That's right. But essential amino acids, which is a really good point, our work, we recommend them.

So especially now with the use of GLP-1s, essential-amino acids EAs seem to be much more valuable, at least in our clinic, because the overall hunger and consumption is down.

And if you're eating two ounces of fish, you're going to get, I don't know, 10 grams of protein or whatever, then adding EAA's essential amino acids with that meal will signal to the body that it's a higher protein meal.

So that's where it can be very valuable. Yeah. No, no. I mean, a huge fan of EAs for GLP-1 use and we're gonna get to GLPs in a bit. Because I think that I mean, at this point, you can't have a conversation without talking about the GLPs and understanding the nuances.

And I love your approach. I've heard it. There's two camps in the world right now. Hopefully, the nuance camp is growing at the expense of the naysayers.

So you've said that modern sedentary behavior, it's not just not moving enough. It's actually a disease state. And you were alluding to that earlier when you we're just talking about the marbling that happens in muscle.

So physiologically, what is an activity we actually do to the body that most people and even most clinicians really underestimate or don't see? There's a handful of things.

And I did my training in geriatrics, and this is very underappreciated, is the simple act of contracting skeletal muscle. When I say skeleta muscle, I'm talking about the muscles under voluntary control.

There are smooth muscle and there's cardiac muscle but skeleto muscle is only organ system that we have voluntary over. Most people recognize the importance of muscle for strength and mobility, all of this other stuff.

I think there are two areas where it's extremely under appreciated. Number one, its role in metabolism. And I'm not talking about that it is a very metabolically active tissue.

Quite frankly, it's not. That is huge misconception. At rest, the body, you're talking just a few calories that resting skeletal muscle burns. It doesn't burn a lot.

When it burns a is when you are using it in activity. So that is very big misconception But something that I don't think that people appreciate is this contractile tissue that skeletal muscle is an endocrine organ.

So when you contract it, it secretes myokines or these hormones that act both locally on the tissue itself, systemically, and on various other tissues, in particular the brain.

When you act, whether you get stronger or not, right, there's, you know, over a thousand myokines, but the simple act of contracting skeletal muscle increases your cognitive abilities, Whether it's executive function, or whether it is working memory.

And another aspect to that is, the faster you move physically, The faster, You think. It improves cognitive processing speed. That's amazing. Well, I think we see it and you see in kids, right, kids who are athletes in school, very often are high performers academically.

The idea, you know, it's so funny to say that I'm working on a talk that i'm giving on Monday. And the idea of dumb jock, I have no idea. Because technically those people are the smartest.

If leg strength is an indication of, if improved leg, strength in essence goes with stronger cognition, these guys are geniuses. Mm-hmm. Well, I think where the dump truck comes from maybe is the occasional person you'll come across or kid who you will come cross who maybe has been told they're not smart and they excel at sports.

And so they just lean into that thing that they are good at. kids will kind of buy it when you say it to them often enough. So anyway, I'm sure that talk will be fascinating.

Okay, so where do you see the research heading next on skeletal muscle functioning like an endocrine organ? And I think you touched on it a minute ago, especially regarding cognition, neuroprotection and mood regulation.

You're touching on that already. Just the mere act of contracting a muscle is going to feed the brain. Maybe let's dive into that a little bit. Well, I think your question is a really good one.

Your question of where do I that the field is going when it comes to skeletal muscle? I'm going to tell you exactly where I it's going because I thin There's going to be a number of things that are going be very uncomfortable for people to hear.

The use of anabolic agents are gonna be important. Anabolic agent are, you're talking about testosterone, but there are other anabolic agents that will be critical for muscle because it's not just the increase in androgenic activity, but there's going to be an increase or a need, again, if we're talking about optimal health, for anabolic activity.

We're taking about anabolic agents, myostatin inhibitors, so there is going be, what I believe, I mean, this, is there has to more interest in that, without a shadow of a doubt, and there are so much stigma around hormones and anabolic agents that I don't know how long it's going to take.

But I think it is the most important aspect. It is one of the important tools that we have to address muscle health. There is another component that is underappreciated that, I do not think we even have enough data, there are two other components.

Number one, actually testing for the quality of muscle, imaging muscle like the way that image fat. We're not there and it's not routinely used and its critical.

We have to get a better understanding and has to be more mainstream. And then the final part is using technology. For example, radio frequency and other technology that allows for super physiological contractions.

why do I say that? People can go and do a squat and I could do 10 reps of a squad and you could 10 raps of the squat. And my husband who's highly trained could you 10 breaths of squat, but we are all stimulating tissue differently.

There isn't, it's much different than nutritional sciences. So for example, for nutritional We pretty much have an idea and we can calculate how much glucose someone can dispose of in a two-hour period.

Right. And we've done those calculations. But for training and muscle stimulation, there's so many other components. There's much genetic variability and there is so much training variability that that is going to require some kind of standardization.

especially with the use of GLP-1s. If we flip on its head that body fat doesn't really matter and skeletal muscle is the organ system that really matters, we are so far behind where we need to be.

So I think things like, there's machines like mSculpt, which has a terrible name, terrible. The idea that we need to sculpt our body is absolutely the wrong thing.

But what's fascinating is that these machines allow for increasing muscle mass. Yeah. So it's by increasing the recruitment of muscle fibers, right? Yes.

The stimulation signaling. And again, I think that the ability to contract and the signal goes down a bit and we really need to streamline that and standardize it.

And that's what I think is going to change everything. Yeah. I actually just acquired a suit, like an electrical muscle stim suit. how I feel about my workouts completely.

It's really interesting. I mean, I'm in beginning stages, but it's a whole different experience because you have muscular contraction happening even without doing anything.

But then when you start using your body, it just goes so much deeper. You do feel more depleted on the other side.

Muscle as an Endocrine Organ for Brain Health

Like, as we get into these technologies and they evolve, And maybe this is where what you're talking about, maybe the anabolic conversation is part of that as well, is that number one, you have to feed the gains.

You have the feed, the depletion. you Have to replete what You've used up. But these anabolic agents, I want to go back to those because I think it's so interesting you bring that up because obviously they've gotten a bad name because they'd been overused and misused forever.

but in an aging population, used in a different way in nuance is going to be a whole new world. I've heard that our satellite cells just don't work properly when we get older, and those are the cells that are responsible for generating new muscle fibers.

I mean, I butchered that explanation. Actually, you bring up this wonderful point. Yes, satellite cells become a bit dysregulated. The immune cells within muscle tissue become dys-regulator.

There's all kinds of things that happen. And anabolic agents, again, it's a very uncomfortable conversation, frankly, for me to have, but I know that it is the future.

And it's kind of like, they took the FDA black box warning off of hormones for women. They're probably going to do the same for testosterone. Yes, but that is now just happening.

Anabolic agents, that's not even entered the conversation. There's anabolic agent that are used for burn victims, for Anemia, FDA approved for anemia of chronic disease, osteoporosis.

But I just think that if we were to get very real, if you really recognize muscle as this organ of longevity, we have to recognize that there are medications that improve its tissue.

And I'm going to tell you something else. Now, just take a moment to think about this. People can go to their doctor and say, I want a medication that is going The doctor doesn't think anything about it.

If a patient goes in and says, I want a medication that's going to make me build muscle. It's like, oh my gosh, you can't do that is insane. So where it cognitively makes absolutely no sense from my perspective.

And I'm hoping the clinicians listening to this podcast also agree. It makes it absolutely. No sense. I was having this conversation recently with someone and I said, this obsession with losing fat.

is like, if you've ever taken an advanced driving course, and they're teaching you about how to take a hairpin turn, they are telling you, don't look at the wall.

Because if look the at wall, that's exactly where you're going. And this obsession with losing fat is missing the point of if we were instead obsessed with building muscle.

we would lose the fat that we needed to lose. And you would end up with the muscle that you need to keep the fad away. It's almost like semantics, but it's putting the emphasis on a different point.

I want to get to the part where we're going to talk about GLPs because I still think they can play a role in this increasing muscle mass if you're used properly, because the mechanism of action is there.

It's just that we're not feeding it properly. But before we go there, I want to go back to this idea of brain power, how resistance training improves brainpower.

This is still very shocking to people, right? You're trying to say this to someone and they're like, blank. It seems so surprising because the majority of the brain, I think probably 30% of brain is all designed for movement.

Remember, we were taught the homunculus. Yeah. So it's fascinating that we're always looking for hacks and shortcuts, but the biggest hack and shortcut would be something strong.

Let's help people understand. Mechanistically, what are the pathways that are feeding back from the muscle to the Well, it's really through this myokine pathway is really what they believe to be the primary from a mechanistic perspective.

And actually, It's so funny that you say that. I will tell you exactly some of the most up-to-date data that I have been looking at, which is… Let's see if I can pull that up.

That would be so awesome. Um, I wonder if it didn't transfer over. Hold on. So there's a handful of big ways and then I'll get into some of the nuances.

In the contractile tissue from, let's see, just give me one second. I'm so excited to be able to share this. Yeah, I was just looking at some recent meta-analysis with this, so it's like very exciting if I can pull it up.

Um, hold on. Give me just a minute. And I'm sure your team can edit out this slight delay. Okay. Oh yeah. I was just looking at all this. Um. The Myokine conversation.

Gosh. All right. Well, yes. So there is, let's talk about first that there's different training modalities. There's resistance training and then there was this physical mental training, right?

Like if we work on balance or whatever, and there there aerobic. Resistance training in particular, which obviously is my first love, seems to affect the brain different.

And we just have to recognize that these are very highly complicated processes. Right? There is the default mode network, there are various parts of the brains, all these different things.

But for example, like high-intensity interval training, there's roughly five different mechanisms that, again, that pretty much we believe is the reason that why it works.

Number one, this myokine production, contracting muscle based on the duration and intensity releases myokines, that there's a whole host. So BDNF is probably the most popular, but there is capdexin B, there are all kinds.

Capdexyin crosses the blood-brain barrier and helps promote neurogenesis and B-DnF release. Again, this is just one. It improves both peripheral blood flow and cerebral bloodflow, which we know.

Then there is also an enhancement in the mitochondrial function, depending on how you're training, whether it's HIIT or resistance training. And then what I thought was really fascinating is that it preserves structural brain function.

I'm not going to mess with my computer, but there was One study that I was looking at, particularly in women, in post-menopausal women that resistance training helped decrease the risk of atrophy.

So brain atrophies, you know, the shrieking of white matter. Yeah. These are really the ways in which, these are a handful of ways, which is pretty well established.

I will also say one other thing. These are mechanisms, how these mechanisms then translate over to humans. We haven't really been able to say, okay, well, this myokine we know primarily does this.

I mean, it's out there in the literature, but I think that it still not it's not as black and white, you know? There's an amazing researcher. So many years ago, there's a woman named Bente Pedersen and she is the one that really discovered this.

She's in immunologist. And so there is theory and then there that practical aspect of, is it really doing what we think? And I think that there are still some questions, but these are some of the main ways that we believe that it works.

Yeah, it's funny, like listening to you speaking about this, you can really feel that what you were saying earlier, that we're so behind on understanding muscle outside of it makes us stronger.

Beyond muscle as a physical thing, this whole idea of muscle, as longevity organ, when people say that it is like, yeah, so that I can walk around and do what I want, but it really is so much more than that.

what you're talking about, regulating inflammation, the immune system, and the brain. It's a major, major player in the whole body. And what makes it the most powerful, it's the only one we have voluntary control over.

Right. So essentially it is a choice. Is it ever too late? No, It is never too Yeah. I mean, I want people to hear that right now, because if you're 70 years old and you haven't seen the inside of a gym or lifted anything beyond a can of whatever, it's not too late for you to get out there and start doing things.

Future of Muscle Medicine and Anabolic Therapies

I think that's really profound because there is always an ability to gets stronger and that critical. It's critical to believe that we can. And one of the things, again, I'm still practicing and in our clinic is called Strong Medical, which is kind of cool.

Love it. As it should be. But the idea that we are limited by age is not true. And, you know, You can always get stronger and there's really only one way to not do it well or at all.

there is very little barrier to entry and I think that people have to take it very seriously and this is a problem is because there's voluntary choice, people sometimes make a choice to not include it and that's a programming.

Well, and there are so many barriers, well, mental barriers to it. And I don't want to get into it even because I think that there's so many more interesting things we could be talking about, but the message to the audience that it's never too late.

And even if you don' have anabolic agents, even you know, your satellite cells aren't working as well. I would think for a person who's sedentary, the growth curve is pretty vertical, at least in the initial stages of training, like how different you'll feel and the progress you make will be dramatic.

There is an adaptation process that happens. The first process is a neuromuscular. It's more of a neural process. And then you build strength. Also, training is skill.

Muscular movement is the skill that we have to become good at. And I will say, even if we are driving toward an outcome of strength, mobility, flexibility, the simple act of doing the activity improves your health.

And it empties the tank. It uses glycogen. it increases these myokines. are critical for our survival, you know? Absolutely. When you talk about myostatin inhibitors, what are your thoughts?

I just thought I'd throw this in there because you brought up myostatin. What are you thoughts on the, there's some gene therapies out there right now, like the folistatin.

Yeah. I don't have enough data to make a scientific thought, but I can tell you my personal thought. Sure. I think that there could be benefit, especially if someone is older.

It seems that it's very easy to turn off the gene therapy. Yeah, I personally don't necessarily see any problem with it. But again, that is not a scientific recommendation.

That's just a personal. Yeah. I was just asking for your personal thought and you're better educated than most to give your first thought. So, um, the way the future and that we have to figure out ways to improve and maintain meaningful muscle.

We have two. I think what I've seen in the people I have known to do it is the person who do the best are the ones who move. It's the one who don't somehow buy this storyline that you're going to a gene therapy and then you dont have to much and things will change.

It's like anything else, but I think over time we'll find that the people who lean in and now take this as an opportunity to put in the physical effort are gonna reap the biggest benefits.

But to your point, it's still early days. So one thing before we move on to GLP-1s is this whole issue of, you've said that brain fog is not always neurological.

No. Yeah. So what are the patterns you're seeing that in patients that really connect the muscle tissue to this whole impaired executive function? Well, I would say that there's a number of things and definitely hormones can play a role.

But the other thing that we see, and this isn't necessarily related to training, but environmental exposures play a huge role. Again, this is what we're seeing in our clinic.

Environmental exposurers play what, we seem to believe to be a big role in cognitive function. Because if the environmental toxin load is so high, again, This is very gray water here.

This not evidence-based in these moments because no one can agree. The environmental medicine doctors don't agree and whatever. But the environmental impact seems to be a huge, and when I say environmental, I mean, mold exposure, air quality, those are huge problems.

I think that as the further we go, I mean, every single physician I talk to, and it doesn't matter what the topic is, is bringing up this idea of toxic load in the body.

I don't think it's rocket science. Yeah, it'll be great when we can quantify it and have more data, if you will, but if the bodies systems for If the body is filled with toxins, it's filled garbage, the system's not going to be able to function properly.

Yeah. That's just not… Do you think that exercise… But I feel like exercise is in a small way, a way to detox or a ways to improve body's ability to clear.

I think if we were to break this down, I'll give you my thoughts. Training is important for a number of reasons. So we've talked about it in improving cerebral blood flow and helping with mitochondrial function.

and improving myokine production. All those things are meaningful. But the other aspect of sweating is also a way to improve the detoxification system.

Another thing that I think is really underappreciated is that as individuals get older, their glutathione production goes down. And this is where dietary protein comes for comes in because we're not eating for protein, we are eating these amino acids.

For example, methionine and cysteine are precursors for glutathione and the production of glutothione as the master antioxidant does decrease. And so there are ways that and you know, why do I tie this into muscles because you obviously muscle stimulated by protein and those choices are if we're eating for healthy brain function, whatever is good for muscle.

seems to be good for brain. Yeah. So 100%. You had said earlier that your belief that you can't build muscle without animal protein has been challenged.

But I would say that it's a lot more work. Would you agree with that? Yeah, I think that, and this data is really the younger generation. 25-year-old men looking at plant protein and animal proteins seem to make the same gains.

They're 25 year old men. Yeah, I know. So again, that's really kind of great for everybody. But the reality is that, so if we were to then take the randomized controlled trials and then put it into practice, into real life, which is not actually how things are designed to do, most aging women are not eating much.

Right. And they're probably not even hitting 1,500 calories. And so if you are going to be consuming a high amount of plant protein, we know because of its bioavailability, you're probably going have to consuming 35% more total calories.

Right. And the right ones. Yeah. With that comes carbohydrates. If you not active and don't have a ton of muscle, then you begin to distort metabolism.

I don t want people to think that you know, in my opinion, plant protein is not the way to go because we already have nutrients at risk, especially for an aging population.

you know, zinc, selenium, all these nutrients that ride along with complex protein sources. Plants are great for fiber and phytonutrients and all this other stuff.

But when we're talking about protein, I think it's a luxury to be able to have access to the kind of food that we have. Yeah. I agree with that also. So I can't believe people are still fighting over it.

It was really interesting. I saw a screenshot. And I looked at this, someone tagged me and Peter Attia and something, and I sent it over to Don Lehman and it was really funny.

And he said, oh, you know, yeah, I've published three randomized controlled trials that say the opposite. Someone was saying that higher protein diets are bad for people over the age of 55. He said oh yeah well I published 3 trials talking about this.

I was like okay. The post I saw was between the ages of, I think it was 50 to 65, that excess protein would overdrive mTOR and increase the risk of cancer.

It's so old school. I don't know who even believes that. it's crazy that it is still out there. Okay. Well, this whole toggle between mTOR and AMPK is really interesting, right?

But are you of the opinion also that every once in a while you do need to go AMPk dominant just to allow the body to clean things up? And by once-in-a-while, I'm thinking it could be once a week.

Brain Fog, Detoxification, and Protein Nuance

I am not saying for a month or two months, but I think we have to get really clear on, so mTOR is mammalian target of rapamycin, or depending on when you studied it, mechanistic target rapomycin.

And it's in every tissue. It is a driver for growth in ever tissue, it is sensitive. to different substrates more primarily in various tissues. In skeletal muscle, mTOR is exquisitely sensitive to leucine and amino acids.

The pancreas and the liver and all these other organs are more sensitive insulin and carbohydrates and excess energy. So why do we care about mTOR? mTor, again, is this cascade, this protein complex.

There's a cascade for muscle protein synthesis. So if we believe that mtor stimulation is bad in muscle because of protein, because that's where it's sensitive to, then we would also believe resistance training and exercise would be bad.

Because that also stimulates mtor in the same robust way. And so the idea that mTOR somehow drives cancer and it's related to protein is incorrect. What's more detrimental is overall total calories, particularly excess consumption of carbohydrates, which drive mtor and all the other tissues.

Okay. And that seems to be completely missed. It's tissue specific. Yeah. No, that's actually really interesting. So I think that the idea though was not so much that mTOR is bad, but more that if that is all we ever think about and never take the foot off the pedal, then maybe there could be value in periodically fasting or, you know, just changing things up a little bit, probably.

But I wouldn't, I don't know if I would think about it in that way. So chronically elevated mTOR is not good. And the way someone would chronicle elevate mtor would be small, high carbohydrate meals throughout the day.

That is not a good idea. But having discrete meals with protein will stimulate mTOR probably less. We don't totally know, might last for five hours. There's other EIF4, there's initiation factors, There are other factors that are also stimulated, which is why you shouldn't do small protein feedings throughout the day either.

I don' agree with that. You should eat protein in discrete meal. So like a bolus, like. Yeah. And then you go through periods of time where your foot is off the pedal.

But again, there's speculation and then there is what does the data show and would long periods or fasting or. decreasing mTOR. I mean, mTor is, you know, if you want it on and then you wanna it off.

But I also don't know if, look at some of Blake Rasmussen's work, I don' know it's ever off, right? It seems to, so again, You know, I don't know if it's the dietary component that we push our foot on, but I will say small

carbohydrate heavy meals throughout the day is not good.

Yeah, this whole idea of grazing all day long, not a good idea in general. You're never taking a break. Okay, let's get into GLPs because GLP's are the molecule of the decade at this point, I think.

They're not about to leave the news anytime soon. So you've spoken very candidly about prescribing GLP-1s when appropriate, but also about this looming crisis of sarcopenic obesity, which let's talk, let us define for the audience what sarco, sarcomenac is the big word, obesity everybody knows.

And so what signs do you look for when you're deciding who's metabolically resilient enough to safely use these meds? Number one, that people should have a choice.

It is their body prescribing. There has to be a reason and there has be safety, uh, safety involved. Um, I think that again, it depends on what the person needs and wants.

For example, let's say a person has been trying to lose 10 pounds for 20 years. They're not grossly overweight, but that 10 pound has has creating quite a bit of cognitive distress.

Then, you know, Why would I not be able to say here as a physician will provide a micro dose to see if that doesn't seem to help lower some inflammation, see, if, that improves your hunger levels, et cetera.

So I think that there is a personal choice perspective of, you know, for the patient and obviously the provider safety, but, um, Yeah. I mean, I think that that's the biggest thing.

And then evaluating, does this person have the right habits to maintain muscle? Because the average person stays on a GLP-1 two years. Then when they come off of that, what happens?

Now they've lost a large amount of muscle, and then where are they? So what do we, what are people, and I mean, I, when I first learned about GLPs, What I learned is that they improve the expression of blood for receptors at skeletal muscles.

So that, that means in plain English that your skeletial muscle is better able to grab glucose out of the blood and use it for energy. That should mean ergo that it's easier to exercise and we should be able, if we're using them properly and exercising that should make it easier to build muscle.

I think that there is going to be emerging data that their positive effects on skeletal muscle and GLP ones as opposed to the negative. Yeah. We're saying it causes a decrease in muscle, and it accelerates muscle loss.

And we don't see data like that. Do I think that it improves glute four receptors in a meaningful way? I'm not sure. But where I do think we are also going to see effect is that, it decreases intermuscular adipose tissue.

It does. And we know that inter-muscular adpose tissues are a problem. Right. That's where we're going start to really see good positive changes, which is one of the reasons why it potentially improves fertility.

Right. Because you talked about PCOS and intramuscular fat earlier. Yeah. Interesting. So for someone who's losing weight fast on GLPs, because this is probably someone, who has a lot of weight to lose, right?

How do you help them assess whether they're losing the right weight? Because even when you talk earlier about the woman or the person, I don't know if you said woman specifically, but someone has been struggling with the same 10 pounds for years.

And it brings to mind post-menopausal women. Postmenopausal women, they wake up one morning and there's 10 pounds that have moved in that wasn't there before and for seemingly no reason.

And I think one of the things that we forget is they may only look like they gained 10 lbs, but if they haven't been

exercising, the actually may have swapped out a whole lot of muscle for fat.

Yeah, and that's really this idea of sarcopenic obesity is that the weight stays the same but the body composition changes. And this is something that we see definitely in aging is that muscle loss increases and fat mass increases.

So lower muscle mass, higher body fat. Yeah. And the solution for that is pretty basic. Resistance, exercise, move. Well, I mean, it's not that simple, but it, yeah.

I struggle with it because again, we worked on some of the early studies before It was really a thing in 2000 and when was it? God, it was a long time ago.

When we shifted from the food guide pyramid to a 1.6 gram per kg protein in the diet, making breakfast a robust amount of protein, those patients lost less muscle mass and less, actually it's lean tissue because it is hard.

is very subtle, right? So if you think about sarcopenia, it's 10% per 10 years, per decade. The DEXA changes are not that sensitive. So skeletal muscle gain and loss, It's not very sensitive, especially it is not sensitive inter-individual.

It is difficult to pick that up.

mTOR, AMPK, and Protein Timing

Is it enough to improve muscle health it is but then the question becomes what would be optimal and will we ever be in a position where you know, people are getting enough training to be optimized.

And that's where I think that things like these machines and radio frequency can really come into play. Yeah. Again, I'm not talking about just good health.

I am talking how do we move people to optimal? We don't even have a number for optimal muscle mass. No. We have numbers for percentage of body fat, but we don' have number where someone should be.

Based on your body, should your percent muscle be 55%? Should we? We don't know. What about genetic variations in that space? Because some people build muscle a whole lot easier than others.

I mean, it's great. And does that mean that you're built to carry less muscle or does just that just mean you are at a disadvantage? I think it is a great question.

Yeah. Um, and I also think that it comes down to fiber types. So there's primary fiber type one, type two, uh, obviously there is type 2X and there are these hybrid fiber You know, type one fibers, people are better at endurance type two fibers.

And again, you can train all of this. There's probably a proclivity to certain things. I think they're all really good questions. We know a lot about muscle when it comes to sport and performance and way less when It comes health and wellness.

You can get an autoimmune disease of skeletal muscle. It's not very common. No one talks about that. What a nightmare. We're checking it. And again, I just think that there's so much related to muscle and where we're going, that it is the most important frontier, especially with the increased usage of open ones.

Yeah, so going back to that, if you had to design a non-negotiable muscle-first protocol for anyone considering a GLP-1, what would the essential anchors be and where do most patients just fall?

Well, that's exactly why I wrote the playbook. So my first book, Forever Strong, was this manifesto and it really talked about the foundational science.

But the Forever strong playbook comes out January 27th and this is all protocol driven. It's both, it's written for providers as well as patients alike.

And it says, It shows you exactly what you need to do. Love it. How to think, how to eat, How To Move. Has a basic training program. It is the book that I wish that had.

And so that's why I wrote it. Nice. So it covers nutrition, right? That's a non-negotiable, how you're going to design a diet. Dietary protein is your first decision.

You have to be creating enough stimulus. It's not about progressive overload, it's about progress stimulus, there's many ways to improve. Because again, your muscle strength and ability will outpace your tendons.

Yes. The last thing that you want to do is get injured. So we put in a protocol for prehab and a protocols for training so that people can then take that forward.

And then you do have to have a how to think section. I mean, people have a million health books on their shelves. What's the difference between being able to be discerning and take the next right action?

And I think that has to addressed. My social goals are get your nutrition right. You have to train, you have be thinking right, and then ultimately you to recover because that's where muscle and that where this recalibration happens.

It's like the world needs a rethink. on exercise and muscle. It'll be interesting to see as we move forward. When you think about what you brought up first when we started the conversation about going camping with your dad and you as a nine-year-old with figuring out how to distribute the load so that not your father saying, it's okay, I'll carry your packs, you guys just come along.

But the two of you sitting there figuring it out and that building into you, both of, this ability and openness to doing work, even when it is hard, that almost has to be brought back into schools.

because we're losing it with little kids in school. Gym programs are getting canceled all over the place and it's being left up to parents to figure out the sports piece for their kids, which is a battle because of screens and whatnot.

But building that in, it like good food, building it in when they're kids and not waiting till they are 30 years old and inflamed and miserable to try and figure it out then.

Yeah, I think that, you know, when we think about setting our youth up and setting standards for them, we're not raising children. We're really raising adults.

Yeah. And that's why I, think it's extremely valuable because think of all the habits that you and I had to unlearn and undo. Now it takes like 20 years to figure that out.

Why not at least take the physical piece off and give them a framework for mental strength and also physical strength. If they decide they don't want to do it, fine.

But as opposed to the opposite, making them have to come into good habits that we know are good for them. So we're raising adults. We're not raising kids.

Yeah. No, it's a great perspective. And the piece of mental strength is very important too. Because if we only think about physical strength without the mental strengths piece, the physical strengths doesn't happen.

Frankly, I think they come hand in hand. It's definitely my directional relationship. You can't do one without the other. Okay, let's jump along here.

Can you walk us through a little bit of your Growth Zone framework? Basically, this is about what are the core

psychological shifts that allow someone to see stress as fuel rather than something to escape.

GLP-1s, Sarcopenic Obesity, and Muscle Preservation

This is still in this whole mindset world. How do we frame, for example, a tough workout as an amazing thing as opposed to, oh God, I just need to get through this?

Yeah, no. So when you think about building capacity, that's what you asked me, right? Yeah. I mean, it's just basically helping people to understand, like, what's that psychological shift that they have to, we need to make so that we can see stress as a good thing?

I'm just reframing, and in this case- Well, before that, you have understand why it even matters to you. Yeah sure. If you feel good being comfortable in the status quo, in your status quo, that's fine.

There's absolutely nothing wrong with that. And then, you know, just be very aware is, do you feel like you're going to wake up with regret one day? Is there this quiet voice that says, working or doing something a little bit more challenging and just fulfilling your own potential.

So I think that, you know, asking really real questions. I mean, I ask questions of myself all the time and constantly challenging myself. It's could this be done better?

Where am I really at with this? And you have to be able to understand your why as to why you are doing. Yeah. And get really clear. You know, as I'm looking at this playbook, what do I think is a really big, important component to understand?

There is capacity. There's this idea that there's really these four quadrants. So there is where we are in a growth zone. And so this is the level of challenge meets your level capacity, and this where you're always feeling just a little bit uncomfortable.

But you can meet the challenge. you know, this is what you do, you were designed for it. And then there's someone who has really high capacity, but their level of challenge is, say, lower by choice.

So they have high capacity, but the level of challenges is like 50%. And this is where you're kind of in recovery. Recovery is this recovery zone. And then there's the stagnation zone, and this the worst place to be.

People go here often when they're in limbo. It's the level of challenge is really low and your capacity usage is low. This is the worst place to be. It is like this lower left-hand corner.

And it's where you're just on autopilot. I think that it is a slow death on auto pilot. Then of course, if the challenge level is too high and you capacity is to low, this is kind of burnout and breakdown.

Yeah, that's all the people going back to the gym in January for the first week and then falling apart at the seams. Yeah. No, but you know what I mean?

Like they go in there all guns blazing with, with crazy expectations and they get super sore. They get injured or whatever the case may be. And then you never see them again.

I used to be a fitness instructor and I saw it every year, September and January people would come in and there so keen and then they just disappear and very often it's outstripping their capacity and just getting frustrated and feeling like I just can't do this.

So getting into that place where you're slightly uncomfortable, you are challenging yourself, but you also are able to pick yourself up the next day and move on.

Yeah, and also just side note, soreness doesn't necessarily mean you had a good workout, right? Sorenness can

be a number of things. It's not an indicator.

it's the end result. That's, not the goal. Yeah. Right. We'll be like, oh, I'm sore. I want to stop. Okay. And it is like good, bad, or indifferent. Well, whereas other people are like if I didn't get sore after that workout clearly I did not work hard enough.

Right, that's not the way we want to think about it. That's the back to the no pain, no gain old school of thought. So maybe let's talk a little bit about the line, and that feeds into this a bit, this whole line between overwork and discipline.

And we see this in high powered executives, so people who just don't cut themselves any slack. People who are just like, if I'm not If I'm not moving, then I am not doing anything.

And you just mentioned recovery a couple of times, which is I think one of the big mistakes that people make with training is they forget to take a day off or two days off, or what are we doing on those days?

It's a hard lesson to learn, by the way. So is your question, what is the fine line? How do you tell the difference in your body between, you know, I mean, like we just said it, You want to push yourself into at least some discomfort, but how do, when you're going too far, how, do we help people discern between those two things?

This is personal for everybody. right? And I used to think that I wasn't doing well if I was just grinding myself to the bone. And it shows up in different ways for different people, but you have to get really clear with yourself.

Are you burned out? Are your skills kind of You know, you're not living up to what you know that you could be, meaning, let's say you go and you give a talk or you do a thing and, and.

You're, not able to do it really well. probably overreaching. It's a very personal thing. Yeah. And I think it's the signs of you're not recovering. I mean, if we take it down to the physical, you are getting sick.

You're getting weaker instead of stronger. Kind of like those obvious markers. who was at the gym every day, seven days a week. And I could see him coming apart at The Seams.

But, you know, what was interesting for this person is it was his way of managing his mental health and he couldn't envision a day where he didn't go to the jam.

Yeah. There's other ways like going to a cold plunge or whatever, but again, if the overall The overall objective is growth. Growth is not, it's not linear.

Yeah, yeah. No, It's helping people to understand that for sure. How early in life do you think we can see the detect, we kind of see, the trajectory of someone who will become sarcopenic?

Like, can you see it early on or is it something that can just set in? That's a great question. I don't think anyone has ever asked me that. That we totally know.

You know, man, that's really great. It's a hard one, but we do know is that when individuals train early, because again, first of all, it's never too late.

But if we were to say, OK, how are we going to protect people from sarcopenia training early? enough where you're priming these satellite cells and these myonuclei is really what we want to be thinking.

So there's no way to tell for sure. Because again, there is autoimmune disease of skeletons, all kinds of things. But if we were to flip that, how do we know or give people the best ability to protect themselves?

It's train early. Yeah. Well, it's instilling it in kids, right? Yeah It also builds the habit. Yeah. It's kind of what you do. You know, there's been a lot of talk about, oh, you know kids shouldn't lift weights.

I totally disagree. Which one? Sorry. Kids shouldn' lift the weights, I'd totally disagreed. Oh, totally. Let's talk that. That's interesting. Yeah, actually saw a nine-year-old doing crazy stuff with a barbell.

And I'm not talking about that, but you my kids are lifting. There's no reason why a child shouldn"t. It's not going to affect growth plates. We're not talking about one rep maxes.

How do we begin to prime the skeletal muscle to do what it needs to and the way to that is to it young. Again, I think it's a really good question. Do we know what someone does to set themselves up for heart disease?

We don't know completely. But I'm guessing, again, what's good for muscle is good, for brain is for all of these things, where training really comes in.

Well, we talk about how disease takes decades to build. You don't wake up one morning diabetic. I think it then follows that if you're not laying down that muscle foundation early in the game, it's just not going to be there for you later.

Which again, as we said earlier, It's never too late and everybody's got some muscle. Like you can't, you wouldn't be moving without it.

Training Mindset, Recovery, and Lifelong Strength

So you could build on whatever you've got, but it'll be easier and you'll have more of it, is there research around people who were athletes and then just became sedentary and go back to it?

Yeah. So those people, these are great questions. Those people seem to have better rebound. You know, there's this idea of muscle memory. It's thought of more as a neuromuscular connection.

Well, I was going to say it's the brain, right? Yeah, yes. But I am telling you from clinical experience, those that were athletes and then became sedentary, they have a much easier time getting back and building muscle.

Very much so. Yeah, that doesn't surprise me. And you know, we think of muscle as muscle, muscle muscle. You've mentioned this a number of times, but the neuromuscular connections like the nerve innervation of the muscle like those path nerve pathways, I'm sure maybe they go dormant, they don't go away.

So you're just reigniting something that was already there. Yeah. I think that the musculature becomes Again, it just becomes primed, efficient. Again can you make muscle sick?

Yes, but there is something to be said for if you have trained and you had been well trained, the body it seems to remember even beyond this neuromuscular connection.

I just think the tissue, whether it's you reinvigorate these satellite cells or whatever. Yeah, the body goes, yeah, I remember this. We can do this! Okay, so now we're just going to wind up now.

You've said that you don't rise to your goals. So what system shifts do you believe longevity-minded adults should implement that today that'll pay off 10, 20, 30 years down the road?

Yeah, this is all about this idea of becoming forever strong. This book is not about muscle and protein. It's about a movement. How do we develop stronger, more resilient people?

And how do have a stronger more, resilient culture? I think it is possible. and setting up a life around that. And this is where we really set standards.

Are you the type of person that trains? Are the types of persons that seek solutions versus find excuses? And you know, movement is critical, it is non-optional, and it's under our voluntary control.

It's not easy, It is a complete pain, right? I dread every Monday. So I train with my coach, his name is Carlos Mata, he's at Sigma here in Houston. I trained three days a week, every night the night before I start bitching about it.

Like in my head, oh, I'm going to wake up late. Oh, got my kids. I can't do it. And every single morning I still go. But I know that I am going bitch about it because it sucks.

It's inconvenient. Yeah. If you choose the harder thing now, life is just a little bit easier. a lot more difficult. And so, you know, training, if I had to pick training or nutrition, I would pick any day of the week over nutrition.

Interesting. Well, listen- Well yeah, You can eat well and not train. Yeah, yeah. I mean, that is what is going to stimulate your tissue the most. Then again, he stimulated it, it crosses the blood brain barriers, all kinds of things that happen.

Um, Yeah. and I'd like to point out to the audience what you just said. Like you are You are an athlete. You're a lifelong athlete, and you have a trainer.

Like, you are not just wandering into the gym saying, I'm going to do bicep curls today. Pardon? I don't even consider myself an athletes. I will say that…

Oh, You look like one. Listen, very spot-high standards in our house. My husband, so he's a third-year urology resident, And he was stressed because they had that in-service, he goes, honey, got to go run a race.

And the race was like 50 hours. And I'm like, honestly, you've lost your mind. You're absolutely bananas. Yeah, I don't consider myself an athlete, but what I do think is that I am not an expert trainer.

I know what position my next is going to be in. And also it's really important. I invest my time and my resources into a coach, which I really think that people should do.

I think it's so important. Also, I don't like training alone. Neither do I. When I was traveling recently in the gym that I go to, they post the workouts.

So while I wasn't in a great place, the weights were rusted, everything was gross, but I could still do the workout. right? I didn't love it because I had no music, there was nobody for me to play with, but I was able to get the workout in and you just feel good.

But having a trainer or doing small group training or whatever it is that's going to it'll pay back in spades. So let's just move into future vision to close the podcast, if that's okay.

What aspect of muscle science, and I can't wait for this answer, do you believe is about to break into the mainstream medicine in the next five years, but most people don't even know is on the radar?

You may have mentioned some of it earlier. Yeah, I think that that is really it. I it's going to be one of a handful of things. It's gonna be the use of anabolics, it is going be better muscle testing, and it will be intramuscular adipose testing and really looking at the quality.

And then the third thing is gonna these machines and these radio frequencies to allow for super muscular contraction. Those are the three things that I think that we're going to start to see that, we desperately need.

And that will change the musculature for people. Right. If you could redesign the standard medical checkup for every adult, what assessments would become mandatory?

You probably are doing it in your practice. Yeah. Strength has to be strength. physical capacity has to be in there. And then all the testing that we think about for metabolic syndrome is really testing for muscle health because it's a metabolic component.

So those are the big things, again, really, testing strength and muscle mass just in general. Yeah, for sure. What's your personal North Star right now, the mission or question you are waking up every day trying to answer?

I mean, I think that it's always the same question. It's how can I be of service? When am I holding up my end of my responsibilities? Love it. And last question, what do you hope people really hear when you say muscle is the organ of longevity?

And what are you fear they might still be missing? That's easy. Strength is a responsibility. And it's the only organ system we have full voluntary control over.

And you have to utilize it now because aging is inevitable. But how we do it collectively will determine our future. As a culture. Love it. Thank you.

That's awesome. Uh, thank you so much, Dr. Lyon. This was a great conversation. Can't wait for your book, January 27th. Please let people know how they can find the book.

Find you, follow your work, all the things. So you can find me on Instagram, Dr. Gabrielle Lyon and our website, drgabriellelyon.com. Our medical practice is listed there, Strong Medical, my podcast.

And then the book can be found on Amazon, Barnes and Noble. Again, this is the books that I wish that had. I just hope that you guys enjoyed it as much as I enjoyed putting it together.

So I think it's gonna be awesome. Thank you so much.