The Truth About Autophagy, MTOR And Longevity Transcript

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Introduction to mTOR and Longevity

Hey, today I'm talking about the truth about mTOR, autophagy and longevity. So what is more, mTOR stands for mammalian target of rapamycin, and it is the master regulator of our metabolism.

It's a nutrient sensing pathway. And what it does is it actually stimulates cell reproduction, cell growth and overall increase in the cell biomass. So it has to do with growing.

So a child is going to have high driving mTOR pathway because they're growing they're growing rapidly. A pregnant woman mTOR is elevated because they're growing a baby right inside of them.

I'm a bodybuilder is actually following a certain pattern to actually increase the amount of mTOR because they want to grow more biomass, they want to grow more muscle, they want more muscle growth.

So mTOR is a master regulator of metabolism. It needs to be balanced with what we call a autophagy, which is signaled by the Ampk pathway.

Autophagy, AMPK, and Cellular Cleanup

So mTOR, there's an enzyme called mTOR kinase, which activates the production of M tours and all of what mTOR does in the body. And then Ampk is what signals autophagy and autophagy is catabolic.

So it helps break down damaged proteins within the cell. What kind of proteins become damaged? Well, all the proteins in the cell, particularly the mitochondria, which is what produces all the energy in the cell.

It's the energy sensor in the cell. It can become damaged from high levels of oxidative stress. It needs to be repaired on a regular basis in order to for the cell to be able to function well, that's what autophagy does.

So mTOR, when whenever you hear longevity experts, they'll talk about the problems with too much mTOR. And the issue with mTOR is, you know, it's it's necessary for growing biomass.

So growing strong, healthy muscle, it's really key for that. However, when mTOR is chronically elevated, it causes too much cell reproduction. It stops autophagy.

And we get an overgrowth of cells with damaged proteins, senescent cells that aren't functioning well. And that accelerates the aging process, creates something called inflammation aging where we have inflammation, that is we have chronic inflammation underlying chronic inflammation that's accelerating or speeding up the aging process in our skin, in our muscles or joints.

And we just don't feel well. We age faster than we should. So is mTOR the problem?

Why Chronic mTOR Elevation Speeds Aging

No, it's the environment that's over activating mTOR and not allowing for enough autophagy, because the big problem with them, tau is if it's elevated for too long, it stops autophagy.

We need to cycle back and forth between mTOR and autophagy. If we have too much autophagy going on, we end up with sarcopenia, meaning that we actually lose too much muscle mass.

And we know that the rate of sarcopenia, the rate of muscle loss, is directly related to earlier mortality or to your mortality rate. So as you're losing muscle, your risk of overall death goes up.

And so clearly we don't want that. So a key biomarker for longevity and good health is maintaining healthy muscle mass, particularly as you're aging. And a lot of the sex hormones like testosterone are going down, which help preserve lean body mass.

You still want to preserve that lean body mass and that has to do with cycling back and forth between autophagy and mTOR, right. Getting the right cycle there.

And so what things help to inhibit mTOR. This is important to know. Here's things that help inhibit mTOR. And these are actually really powerful things because we need them and we can utilize them strategically at times.

Fasting intermittent fasting or extended fasting really key ketones elevated in our bloodstream. So in ketosis, when we get into nutritional ketosis we do that because our body says, okay, wow, we don't have enough, available glucose.

So we need to start burning fat for fuel. And we actually need to get fat across the blood brain barrier. We can't actually get fat fatty acids across the blood brain barrier.

So our liver takes the fatty acids, produces turns them into a smaller chain, water soluble molecule we call ketones. Those ketones get in the bloodstream, get into the brain.

How to Inhibit mTOR with Fasting and Ketosis

They actually reduce brain inflammation. And on top of that they slow down mTOR. Right. And they trigger autophagy inside of our system. Now there's other polyphenols as well.

Things like green tea which has something called catechins products epi galactose and epi galectin catechin. Is one of the most powerful ones. Yeah. Things like berberine.

You have things like turmeric you have which has curcumin in it. You have a regen. Oh. Which has, Castle black acid in it. You've got rosemary, all of these kind of polyphenol rich herbs.

They all can help support and and drive up autophagy and inhibit mTOR. Right. And that's the key is they bring down mTOR, which allows for autophagy. Caffeine is another one.

So doing caffeine itself actually will inhibit mTOR. And that because it's inhibiting putting the brakes on mTOR it increases autophagy in our system.

But the biggest drivers are fasting as well as getting in ketosis. Now what actually drives and increases mTOR. That's going to be high carbohydrate load, high amino acids in the bloodstream.

That's also going to be high insulin, high insulin levels in general, like after having a big meal, particularly a big meal with a lot of starch or sugar in it, that's going to drive up insulin, high testosterone levels, it's also going to be driven up by exercise, right?

Strength training, things like that. And exercise is really interesting actually. Exercise actually has kind of a dual effect. Exercise will prime the core pathway, meaning that it will actually put the brakes on it and accelerate it at the same time.

I'm going to explain that just a second, because I know that's confusing. But other things that drive it are inflammation in general. So we have inflammation in our system.

The inflammatory cytokines will drive more mTOR.

What Raises mTOR: Food, Hormones, and Inflammation

So when people are undergoing inflammation they're actually cycling into their their, building phase of their cell danger response and their healing cycle.

And they drive more mTOR, activation. And so we got to keep inflammation under control to undergo proper amounts of autophagy as well. So going back to exercise, exercise works into my model of balancing mTOR and Ampk, which is the spring loading pathway.

Right. So what we want to do is we want to spring load mTOR. So we want to think about a slinky. We want to cock the slinky or kind of push down on it that's inhibiting mTOR, which exercise does.

It's the moments right after exercise. Exercise itself is very catabolic. So it's breaking down cells and proteins. It actually drives autophagy. The thing about it is right after exercise the body starts going into adaptation mode.

And in order to adapt properly, we need to build healthy skeletal muscle from when we're adapting from exercise. That triggers, mTOR. And so while we're exercising, we're actually inhibiting mTOR and activating autophagy after we're done exercising.

And we're in recovery mode now we're actually activating mTOR. And so the best strategy for balancing autophagy and mTOR is incorporating intermittent fasting.

And I recommend at least 14 hours of intermittent fasting overnight and eating your meals in something like a 6 to 10 hour eating window.

Exercise, Recovery, and the mTOR Cycle

So you're either eating in a six hour eating window, an eight hour eating window, or maybe a ten hour eating window, depending on, you know, what your schedule allows and what makes you feel best.

I recommend exercising, right? Ideally right at the end of your fast, because that is going to push down mTOR even more and spring load it like a slinky.

And what happens when you let go of the slinky, right? You push it down and then all of a sudden it accelerates and it has all this potential energy that gets activated and it jumps up to the next step.

Well, that's what we want to do with mTOR. We want mTOR activated, but only for short periods of time throughout the day. And so after we're done exercising, that's when we have a recovery meal.

We're stimulating mTOR to rebuild new healthy muscle tissue. And that's when we activate and start our eating window. Right now, you can also exercise during your eating window.

Maybe you had a meal several hours before, then you exercised and then you had another meal afterwards. That's fine too, but I find it to be the most effective when we exercise right at the end of our fasting window.

And then again, you know, we're activating mTOR right after that with our meals in our 6 to 10 hour eating window. And when we consume our meals, we want to make sure we're consuming, you know, a healthy amount of protein, okay.

Making sure we're getting 30 to 50g of protein like I talk about continuously. So we're getting the branch chain amino acids we need in order to, rebuild new healthy muscle tissue and also to stabilize blood sugar.

When we get enough protein, that's going to reduce the overall amount of insulin, which is key. We want insulin production, for sure, but we don't want too much insulin, because then we can end up with insulin resistance.

And it can be harder to fast. And so we want to make sure we're getting enough protein. We want to make sure we get some good carbohydrates on board, ideally from healthy, nutrient dense sources like fruit, for example, which is

a great source of good carbohydrates.

Maybe root vegetables, things like that.

Fasting Windows, Protein, and Longevity Strategy

We want to make sure we have healthy fats on board in our meals, and that's going to allow us to recover properly, get the right amount of mTOR secretion.

And then when we finish our our eating window, we go right back into fasting. While we're fasting, we can use caffeine, for example, to stimulate or to further suppress mTOR week.

You know, ideally obviously fasting you're using caffeine, doing it in the morning, not at night. And then we can also use some of these different polyphenols, these different herbs. Right.

We can do whether it's green tea or we can take a berberine supplement or something along those lines to help further suppress mTOR, which will help increase ketone production.

And we get more autophagy, during that phase. So really the key to longevity is not just suppressing mTOR, but it's cycling between proper amounts of mTOR and proper amounts of autophagy.

A lot of longevity experts, they get it wrong. They're all about suppressing mTOR. And they do that through low calorie diets, low protein diets. So they're under eating on calories, not getting enough protein.

And therefore they get sarcopenia. They lose muscle mass. They are getting a lot of autophagy, but they're also losing muscle mass. We want to do it in such a way that optimizes muscle mass, but also allows us to get rid of the damaged proteins through that process of autophagy so we can really age successfully and thrive in life.

So hopefully you guys enjoyed this and we'll see you in a future video training. Be blessed.