Is TB-500 Actually Thymosin Beta 4? The Science Explained Transcript

(Transcripts are generated by AI and may contain errors)

Are Thymosin Beta-4 and TB-500 the Same

If you spend even a If you spend even a little time researching little time researching peptides that peptides that aid in aid in healing, you've probably healing, you've probably come across two come across two that are used as if they were the same thing. Thymosin beta-4 thing. Thymosin beta-4 and TB500. But are they the and TB500. But are they the same? Are same? Are they interchangeable?

they interchangeable? Not quite. And the gap Not quite. And the gap between what people between what people assume about these assume about these two peptides and what the research actually shows is bigger research actually shows is bigger than most people than most people realize. Welcome realize. Welcome back to the Dr. Greg Jones Optimization Academy podcast. I'm Dr. Greg Jones, a. I'm Dr. Greg Jones, a naturopathic doctor and naturopathic doctor and founder of the Center for founder of the Center for Innovative Innovative Innovative Health here in Health here in Phoenix, Arizona. Today we're. Today we're taking a look at taking a look at thymosin beta-4 and thymosin beta-4 and TB500: what each TB500: what each actually actually actually is, what sets them apart, is, what sets them apart, and how the and how the research evidence research evidence for one compares to the other. Now, a quick. Now, a quick note before note before we get to the we get to the point. This is educational point. This is educational content and nothing in content and nothing in this video constitutes this video constitutes medical advice or a medical advice or a recommendation recommendation recommendation to use any of these peptides.

any of these peptides.

The Real Structural Difference

So first, let's So first, let's clear up the biggest clear up the biggest mistake, because mistake, because it changes the way you look at it changes the way you look at everything else in this everything else in this video. Thymosin beta-4 is a 43- is a 43- amino acid peptide that your amino acid peptide that your body already body already produces. It is produces. It is present in almost present in almost every one of your cells, every one of your cells, and your platelets and your platelets release it in release it in large quantities when tissue is damaged. But TB500 is not tissue is damaged. But TB500 is not that molecule. It's a that molecule. It's a synthetic peptide synthetic peptide just seven just seven amino acids long, amino acids long, designed to designed to copy one copy one specific part of specific part of thymosin beta-4, the very thymosin beta-4, the very part that part that binds to binds to actin—a structural actin—a structural protein in your protein in your cells that cells that controls their movement controls their movement and repair. Therefore, and repair. Therefore, TB500 corresponds to TB500 corresponds to amino acids 17 to amino acids 17 to 23 of the complete 23 of the complete sequence of sequence of sequence of thymosin beta-4. This is a thymosin beta-4. This is a seven- seven- seven- amino acid fragment amino acid fragment cut from the cut from the original, which original, which consists of 43 consists of 43 amino acids.

amino acids. Same starting Same starting material, but a completely material, but a completely different different different molecular size. Think of molecular size. Think of thymosin beta-4 as a thymosin beta-4 as a complete orchestra. TB500 is a string section is a string section that was separated and that was separated and brought to the stage brought to the stage separately. You still separately. You still hear the music, but from the hear the music, but from the same same same composition. You just composition.

Where Each Peptide Comes From

You just don't hear the whole piece in its don't hear the whole piece in its entirety. So let's take a entirety. So let's take a closer closer closer look at where look at where they come from.

they come from. Thymosin beta-4 is Thymosin beta-4 is circulating in your circulating in your body right body right now, encoded by now, encoded by a gene called TMSB4X.

a gene called TMSB4X. And it's one of the first " reagents" that your reagents" that your platelets platelets platelets release after an release after an injury. But TB500 is injury. But TB500 is not found not found naturally anywhere in the naturally anywhere in the human body. It is human body. It is synthetic, it is synthetic, it is easier to produce, it is easier to produce, it is cheaper to cheaper to manufacture, and it is more manufacture, and it is more chemically stable chemically stable than the full-length than the full-length peptide. And this peptide. And this distinction explains distinction explains much of the much of the marketing marketing marketing confusion in this confusion in this industry. TB-500 industry. TB-500 is often sold under the name is often sold under the name thymosin beta-4. This thymosin beta-4. This happens happens happens all the time because all the time because they share a common they share a common research history research history and basic mechanism of and basic mechanism of action. But when you action. But when you read a study read a study or a product label, or a product label, you need to know you need to know which molecule which molecule you're looking at, because you're looking at, because the evidence for them is not the evidence for them is not interchangeable.

interchangeable. interchangeable.

How They Work at the Cellular Level

We'll We'll We'll go into detail about why in a minute. go into detail about why in a minute. Both molecules Both molecules operate on the operate on the same same same fundamental fundamental fundamental biology. They biology. They bind to a protein bind to a protein in your cells in your cells called G- actin. And this actin. And this binding binding binding controls how cells controls how cells move, migrate move, migrate to damaged to damaged tissue, and tissue, and rebuild their rebuild their internal framework.

internal framework. This mechanism is This mechanism is the basis for wound healing, the basis for wound healing, tissue repair, tissue repair, and the formation of new and the formation of new blood vessels, which blood vessels, which are associated with both are associated with both compounds. But compounds. But full-length full-length full-length thymosin beta-4 does thymosin beta-4 does more. In addition to the actin- binding binding binding portion, it activates a portion, it activates a signaling pathway signaling pathway called integrin- linked kinase, which linked kinase, which plays an important plays an important role in the survival of role in the survival of stressed cells stressed cells after injury.

after injury. It also inhibits a It also inhibits a separate pathway called separate pathway called NF-kappa-beta, which NF-kappa-beta, which provokes inflammation.

provokes inflammation. These additional These additional signaling pathways signaling pathways explain why explain why thymosin beta-4 thymosin beta-4 is mentioned in wound healing, cardiovascular protection, and cardiovascular protection, and neurological neurological neurological recovery protocols. TB-500 does recovery protocols. TB-500 does indeed retain indeed retain actin binding activity, as this is the very, as this is the very site from which it site from which it was created. However, was created. However, the broader structural and the broader structural and signaling roles signaling roles provided by the rest of the provided by the rest of the 43- 43- 43- amino acid peptide are not amino acid peptide are not necessarily necessarily necessarily conserved in conserved in a fragment that a fragment that is 1/6 its is 1/6 its size. It's like the size. It's like the difference between hiring difference between hiring one employee one employee who previously worked who previously worked for a company with 100 for a company with 100 different departments and different departments and hiring an entire hiring an entire company. This one company.

What the Human Clinical Research Shows

This one employee may be an employee may be an excellent specialist in a excellent specialist in a specific field, specific field, but they simply won't but they simply won't be able to be able to manage payroll, manage payroll, legal issues, legal issues, and operations at the same time. So and operations at the same time. So what about human research and what about human research and trials trials trials? This is where these two? This is where these two compounds compounds compounds differ significantly.

differ significantly. Full-length Full-length Full-length thymosin beta-4 has thymosin beta-4 has real real real human

clinical trial data. human clinical trial data.

In a phase three In a phase three trial trial trial published in published in 2022, thymosin beta-4 2022, thymosin beta-4 was tested as an eye was tested as an eye drop to treat a drop to treat a serious serious serious corneal disease called neurotrophic neurotrophic neurotrophic keratopathy. Six out of keratopathy. Six out of 10 patients 10 patients treated made a treated made a full recovery within 4 full recovery within 4 weeks, compared with weeks, compared with one out of eight in the one out of eight in the placebo group. This placebo group. This formulation, known as RGN- 259, has FDA 259, has FDA orphan drug status orphan drug status for this condition, for this condition, although it has not yet although it has not yet received full received full FDA approval. Regarding the FDA approval. Regarding the cardiology cardiology cardiology field, in a field, in a 2025 randomized trial, a 2025 randomized trial, a recombinant form of recombinant form of thymosin beta-4 was thymosin beta-4 was given to 96 patients given to 96 patients recovering recovering recovering from a heart attack. The group from a heart attack. The group as a whole did not show a as a whole did not show a significant difference in significant difference in recovery time, but recovery time, but patients who patients who were treated within 8 were treated within 8 hours of the hours of the procedure had a procedure had a noticeable reduction in noticeable reduction in damaged damaged damaged heart tissue. However, there is less evidence for TB-500 heart tissue. However, there is less evidence for TB-500, and this is a, and this is a detail that surprises detail that surprises people. As of this people. As of this year, there are no published year, there are no published human trials human trials of the of the fragment itself. And fragment itself. And a lot of the a lot of the animal studies you animal studies you see under the name TB-500 were actually done on the were actually done on the full-length full-length full-length peptide, not the peptide, not the seven-amino acid seven-amino acid seven-amino acid fragment. A prominent fragment. A prominent 2004 study in the 2004 study in the journal Nature on heart attack recovery in heart attack recovery in mice, for example, mice, for example, used used used full-length full-length full-length thymosin beta-4, not thymosin beta-4, not TB500, although it is TB500, although it is consistently referenced consistently referenced in TB500 marketing.

in TB500 marketing. Studies Studies Studies specific to this specific to this fragment fragment fragment confirm that the actin binding domain retains actin binding domain retains genuine biological genuine biological activity, activity, activity, including including including proangiogenic effects proangiogenic effects in animal models. This is in animal models. This is legitimate science. It's legitimate science. It's just less voluminous just less voluminous and less specific to the and less specific to the fragment itself than what fragment itself than what you see on you see on the Internet. Here's the Internet. Here's another analogy. If another analogy. If thymosin beta-4 has a thymosin beta-4 has a documented base documented base that includes that includes data verification, recommendations data verification, recommendations and years of and years of proven proven proven work experience, then TB- 500 has an equally 500 has an equally impressive resume that no employer has yet employer has yet checked. The resume checked.

Which Peptide Is Right for Your Case

The resume may be true, may be true, it just hasn't been it just hasn't been verified. I verified. I understand. Choosing understand. Choosing dietary supplements dietary supplements can be can be daunting. There are daunting. There are hundreds of brands, hundreds of brands, conflicting claims, and conflicting claims, and no way no way to know what to know what is truly beneficial and what will is truly beneficial and what will really impact your really impact your health. That's why I health. That's why I created the created the Dr. Supplement Store. Jones. Every Dr. Supplement Store. Jones. Every product in the store product in the store for energy, for energy, gut health, gut health, sleep, sleep, sleep, hormone optimization, hormone optimization, recovery, and more— has been personally reviewed, tested, and, tested, and recommended by me.

recommended by me. These are the exact formulas These are the exact formulas I use and I use and recommend to my recommend to my patients, friends, and patients, friends, and family. So, family. So, go to go to drjonesseupplements.com, drjonesseupplements.com, drjonesseupplements.com, sign up for the sign up for the email newsletter, email newsletter, and you will receive a and you will receive a 10% discount on your first order. You will also receive. You will also receive exclusive exclusive exclusive protocols and insights protocols and insights that I share only that I share only with my community.

with my community. So discard the unnecessary and So discard the unnecessary and choose what choose what actually works. actually works.

Clinical Framework for Choosing Between Them

So, what is actually So, what is actually better? Honestly, better? Honestly, this question doesn't have a this question doesn't have a simple simple yes or no answer. In yes or no answer. In practice, it all practice, it all comes down to two comes down to two things: what exactly you and things: what exactly you and your doctor your doctor are trying to decide are trying to decide and what you have and what you have access to. Here's what I can access to. Here's what I can tell you after tell you after years of years of using both using both peptides in the clinic. Both peptides in the clinic. Both TB-500 and Thymosin Beta-4 TB-500 and Thymosin Beta-4 have helped reduce have helped reduce pain and speed pain and speed healing in my healing in my patients, but neither patients, but neither is a magic is a magic pill. Before pill. Before incorporating any incorporating any compound into your compound into your treatment plan, you must treatment plan, you must find the true find the true source of the pain, source of the pain, correct the mechanical correct the mechanical or structural or structural issues issues issues causing it, and causing it, and build a build a build a synergistic approach synergistic approach to the regenerative to the regenerative process. If process. If you skip these steps, you skip these steps, you are simply masking you are simply masking your symptoms with an your symptoms with an expensive peptide. With expensive peptide. With that foundation, here is the that foundation, here is the structure I structure I personally rely on. TB- 500 may be more 500 may be more effective in effective in simpler, acute simpler, acute cases of trauma— something clearly something clearly defined, defined, defined, recent, without recent, without many aggravating many aggravating factors. Thymosin factors. Thymosin beta-4, in my opinion, is just as beta-4, in my opinion, is just as effective for effective for healing; but healing; but because it's a because it's a broader-spectrum peptide, broader-spectrum peptide, I might choose it I might choose it when there's something more underlying the injury —whether it's chronic —whether it's chronic inflammation, inflammation, inflammation, immune immune immune system dysfunction, or a broader system dysfunction, or a broader systemic problem, systemic problem, including autoimmune including autoimmune conditions. The 43- conditions. The 43- amino acid version works amino acid version works not only with the tissue, but not only with the tissue, but also with the entire environment also with the entire environment in which that tissue in which that tissue is trying is trying is trying to recover. And I want to recover. And I want to be frank about to be frank about it. This is not medical it. This is not medical advice, but merely a advice, but merely a clinical concept clinical concept that I share that I share based on my own based on my own observations while observations while treating patients with treating patients with both peptides. What is both peptides. What is right for right for your situation is a your situation is a question worth question worth discussing with your discussing with your doctor. A question that doctor.

Key Takeaways

A question that starts with what starts with what exactly you are treating and exactly you are treating and what is actually what is actually available to you. So, if you've available to you. So, if you've been trying been trying been trying to figure out if to figure out if thymosin beta- 4 and TB-500 are really 4 and TB-500 are really interchangeable and interchangeable and you've been told that they're you've been told that they're actually the same actually the same compound with two compound with two different names, different names, I hope this video I hope this video has brought some clarity. If you found this analysis helpful, please like you found this analysis helpful, please like,,, subscribe to the subscribe to the channel for channel for more science- more science- based data based data on peptides, on peptides, longevity, and longevity, and hormones, and share hormones, and share this video with anyone this video with anyone considering considering considering using these using these two peptides. Thank you two peptides. Thank you for watching. I'm Dr.

for watching. I'm Dr. Greg Jones, and Greg Jones, and I'll see you in the I'll see you in the