Titin is Made of Collagen

For every actin-myosin contractile element of a muscle fiber, there is a connective tissue component, called titin, which roots actin to what is known as the "z-disk.

Titin is kind of like the root, supporting the plant from the ground - and the ground is the z-disk. Myosin, when contracting, pulls on actin. So, if titin holds actin in place, then titin is being pulled by myosin as well. Conclusion: titin has to be at least as strong as actin.

What if you had CDS? Titin, a form of connective tissue responsible for attaching actin filaments to z-discs, would then be the weak link in muscular strength development. It's kind of like using your hands to pull a plant out of the ground. The weakest part of the plant is where it breaks, but if the plant and root system is strong, you can pull the whole thing out of the ground at once. The stability of a muscle follows the same concept. If you contract the muscle under extreme load, it will survive only if the myosin (your grip), actin (the plant), and titin (the root) is strong enough to maintain the integrity of the muscle that pulls on the bone. Otherwise, the weak link is exposed and the muscle tears.

Most athletes consuming conventional protein sources may be missing out on some of the ingredients that collagen offers. In muscular activity, the tensile strength of your collagen is just as important as the relative tension your muscle makes when you lift weights.

Some Stats:
Both collagen and another form of connective tissue, keratin, contain a very unique portfolio of amino acids - quite different than a traditional whey protein supplement:

27% Glycine
11% Alanine
12% Glutamate
30% Proline and Hydroxyproline - a strong base
Collagen also possesses two special forms of amino acids - hydroxylated proline and lysine. These are two non-standard amino acids the body manufactures specifically for collagen. Collagen, as a supplement, already has these pre-made.

The Dynamics of Growth Hormone vs. Cortisol

We all know how insuline works. When blood sugar is high (after a meal high in carbs), insulin goes up and transports glucose into cells. It's pretty plain to see that insulin is made by the pancreas on demand. What I mean is, there doesn't seem to be a limit to the amount of insulin the pancreas can produce (within reason). So, why is it that everyone seems to think that Growth Hormone (GH) production is such a commodity?

GH, like any other hormone, is produced according to demand. In the 80's everyone was jumping on the arginine/ornithine bandwagon, thinking these two amino acids would make GH. The truth is, GH is made up from over 180 amino acids, of which Arg and Orn are a distinct minority.

We don't take glycine and cysteine to stimulate insulin production - we take sugar and dextrose to stimulate insulin. Although there is a significant amount of both glycine and cysteine in the structure of insulin, insulin is a hormone-on-demand - it's made when it's stimulated, not when you eat a meal that's high in cysteine and glycine.

What then, do we need to put into our blood system to create a demand for GH? Sugar does it for insulin, what does it for GH? Well, let's think first about what GH does. In puberty, GH is very active putting collagen together - growing bones, padding cartilage, and supporting muscle development. Most athletes primarily attribute muscle growth to GH when, in fact, that is not the case. Have you ever met someone who has acromegaly? Remember Andre the Giant? Acromegaly occurs when GH output is excessive over long periods of time. These people tend to be very tall, have thick, long bones, and enlarged organs (like the heart and muscles). GH grows connective tissue and muscle. Not just muscle.

And just like the hormone glucagons opposes the effects of insulin, cortisol is the hormone that opposes GH. So, if GH primarily deposits collagen (like insulin primarily deposits glucose) then collagen, when in the bloodstream, may stimulate GH production and inhibit cortisol output. We appear to have found the ultimate anti-catabolic!

Editor's note: Check out Dr. Hollis' Pro-Lean formulation. In the next Advanced Therapeutics - Collagen and AGE-ing.

Michael J. Hollis
mhollis@renegadenutrition.com

References:


Here are some stats I'd love to see but don't see how to generate---maybe you folks see more than me. * frequency of appearance of new altcoins---how many altcoins appear per unit time (you choose the most germane unit) * average length of life for an altcoin---what's the average time between first block mined and last block mined for an arbitrary altcoin. I suppose that what happens at the end of an altcoin's life is that no one is mining it anymore. Translations in context of "some state" in English-Russian from Reverso Context:

Maximum pensions for public employees relative to wages are nearly twice as high as in Spain; the government favors business elites with tax-free status; and some state employees draw their salaries without actually turning up for work.Ä These examples may contain rude words based on your search. These examples may contain colloquial words based on your search. Translation of "some state" in Russian. Search some state in: Web.