

Exercise & Irisin

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Aging isn't just about living longer. It's vibrant living as we age, and being aware of new research ramps up our exercise genes. Let me remind you that lean muscle mass is the number one indicator of longevity and performance. And just like cytokines can turn up or down inflammation, cellular messengers called myokines are secreted by muscles. Myokines are so important that muscle cells are now being recognized as the largest secreting organ. Among other things, myokines are associated with improved cognition and stimulate BDNF (brain derived neurotrophic factor). Receptors for myokines are found on muscle, fat, liver, pancreas, bone, heart, and brain cells. They also participate in tissue regeneration and repair, mitochondrial enhancement, immunomodulation, and cell signaling.

We've known exercise improves cognition and mitochondrial enhancement, but NOW we know how. A friend and colleague, Dr. Devaki Berkson shared a study from her sub stack, “Agile Thinking,” on the



protective role of exercise and brain health. “Medical researchers have used a 3D human neural cell culture model to show that the exercise-induced muscle hormone, irisin, reduces the level of amyloid beta deposits associated with Alzheimer's disease.”

Let's unpack that statement and look at irisin for a moment. Irisin is one of many myokines that are released as we exercise. Irisin regulates glucose and lipid metabolism in adipose tissue and increases energy expenditure. It does this by accelerating the browning of white adipose tissue. Irisin has been shown to be present in human and

mouse brains, particularly in the hippocampus. Recently, it has been reported that irisin levels are reduced in the hippocampus and cerebrospinal fluid (CSF) of Alzheimer's disease patients as well as in the brains of Alzheimer's disease mouse models. Irisin treatment in mice led to a remarkable reduction of amyloid beta pathology. This amazing brain-protective effect of irisin was attributed to increased nepri-lysin activity. Nepri-lysin is an amyloid beta-degrading enzyme that has been found to be elevated in the brains of mice with Alzheimer's disease that were exposed to exercise or other conditions leading to reduced amyloid beta. When

these mice are exercised, this increases irisin, which in turn activates or increases nepri-lysin, and this reduces amyloid beta. So, exercise boosts irisin release from muscles, which in turn boosts nepri-lysin from brain astrocytes and reduces amyloid beta.

Previous studies have shown that in mice, irisin injected into the bloodstream can make its way into the brain. When you exercise and your muscles boost irisin, this crosses the blood-brain barrier and protects you. Most of us are familiar with the failure of pharmaceutical agents to reduce amyloid plaque. And although the focus here is irisin, let's remember that multiple myokines are released with exercise, and multiple mechanisms are at work. So, to identify one myokine is cool, but the bigger picture is to exercise. In terms of nutrients to maximize the effects of exercise, consider Whey Protein Isolate, Bio-Ashwagandha, or Gammanol Forte with Frac.

Whey protein supplies 20 grams of usable protein per 2 scoops. It has also been shown to increase glutathione which tends to decrease as we age. Bio-Ashwagandha, a 4000-year-old adaptogen, has been shown to support adrenal function and increase lean muscle mass and testosterone in males. Gammanol Forte has been shown to increase growth hormone as well as provide antioxidant protection. The overall effect of both Bio-Ashwagandha and Gammanol Forte is an increase in strength. And when you feel stronger you want to keep exercising to keep feeling strong. The corollary benefits to both these supplements are massive. You can

see other Tuesday Minutes that highlight these products to the right.

One of my heroes, Dr. George Goodheart, always used say. "find a way to measure something and then measure, measure, measure." Everyone has different practice styles, so I encourage you to find ways to measure muscle strength and fitness in your practice. Two ways are using hand grip strength dynamometers or body composition equipment. For the dynamometer, patients squeeze it with all of their strength, typically three times with each hand. An average score is then calculated using the measurements from both hands. A 2010 article published in the *Journal of the American Geriatric Society* found that when using a dynamometer, healthy minimum squeeze measurements associated with better mobility in older adults were approximately 72.6 pounds for men and 44 pounds for women of normal weight.

I'm part of a small group of guys who get together once a month to measure body composition and then get lunch. To be honest, even though I know the benefits of exercise, when I see the changes, whether positive or negative, it really motivates me. Acquiring a baseline fitness level, and then ongoing retesting with encouragement and compassion, can really help keep your patients engaged in their health. And that's our goal, keeping them engaged with their own health.

Thanks for taking time to be with me today, I look forward to being with you again next Tuesday.