

Autophagy

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Autophagy: it's a word you will hear a lot about in the future. It basically means "self-eating", kind of a cellular self-cannibalism. It's how your body cleanses itself of cellular debris and then recycles materials to make more resilient cells. For example, we have anywhere from 100-2000 mitochondria in each cell. When they begin to function poorly, signals are sent to cannibalize and re-purpose raw materials to make stronger, more efficient mitochondria.



My thanks to Naomi Whittel and her book titled *Glow15*. She has summarized data from researchers around the world and created a system integrating food, exercise, lifestyle, as well as, practical recipes, to maximize autophagy.

As you may suspect, as we age we lose our ability to clean up cellular debris and cells start to accumulate damaged proteins, dysfunctional and other dead organelles, and unnecessary cells. I heard a researcher compare it to garbage bags piling up in your cells. You look and feel old because

your cells are carrying around dead weight.

In the brain, this dead weight can lead to Alzheimer's. In the pancreas, it interferes with the insulin-secreting beta cells and can lead to diabetes. It can affect your heart, lungs, joints and virtually any organ and lead to conditions like heart disease, hypertension, cancer and arthritis.

Cleaning up cellular waste and inefficient organelles is a good thing but the beauty of the autophagy process is the recycling of cellular debris into energy and more efficient or-

ganelles. One of the ways this self-repair mechanism is initiated is by stress. It seems all the anti-aging strategies we read about stimulate autophagy directly or indirectly.

In animal models the number one strategy for longevity is caloric restriction. In humans the best predictor of healthy aging is % lean muscle mass. So it is no surprise that caloric restriction, intermittent fasting, interval training, saunas, ice or cold water are major autophagy inducers. But other life style modifications like reducing insulin and increas-

ing glucagon encourage autophagy as well.

Intermittent fasting is a term that refers to going 16 hours without insulin inducing foods and then eating in an 8 hour period. Typically people eat dinner and then skip breakfast and eat lunch. Sugar free beverages may be ingested and even MCT oil or healthy fats can be eaten as they will not induce insulin. Intermittent fasting will naturally increase glucagon which in turn activates autophagy.

When you hear all the benefits of autophagy you think, I want that process on 24/7. But here's why you don't. Think of autophagy as a catabolic process that digests and recycles waste but we need the anabolic aspect to rebuild and repair cells as well. So living in constant autophagy is not healthy either.

The goal is to naturally turn autophagy on and off and simultaneously integrate foods and botanicals that activate autophagy. In that light, Whittel suggests three non consecutive days of intermittent fasting which she calls the low days and four days off called the high days. Most people pick Monday, Wednesday and Friday as their low days and enjoy more liberal diets on the weekends.

Exercise should be done on the high days. She suggests two days of high intensive interval training (HIIT) and two days of resistance training. Remember stress induces autophagy. So the high intensity interval training induces autophagy systemically whereas the resistance training induces stress and autophagy in the muscles.

Protein cycling was a new term for me. Creating temporary protein deficiency lowers insulin levels and increases glucagon which activates autophagy. On intermittent fasting or the "low days" reduce protein levels to 25% of your optimal levels or less than 25 grams. This will induce the body to digest malfunctioning intracellular proteins.

Another principle is the timing of foods. She suggests fats first and carbs last. Interestingly, autophagy is promoted by fats. Studies show fats like MCT oil and omega-3 oils promote autophagy. Eating protein and carbs can initiate insulin, fats will not. You can find many examples of the foods that activate autophagy in her book *Glow15*. By the way, the reason the book is called *Glow15* is that during a 60 day trial 34 women ages 35-60 had documented changes in weight, skin quality and texture in 15 days. Friends and family said they "glowed". 100% of the women lost fat mass and gained lean muscle.

But perhaps the most important piece of this research was the compliance of the participants. 33 out of 34 people completed the study and the 34th person that was forced to drop out, returned to follow the principles just because she felt so good.

Whittel coined a term "Power Phenols". Power Phenols are potent antioxidants that not only protect cells but boost autophagy to repair them.

It should come as no surprise to regular viewers that the botanicals: trans resveratrol as in ResveraSirt, organic curcumin as in Curcum-Rx, berberine as in Berberine HCl and EGCG as in Biotics EGCG-2000 were the products that boost autophagy the most. You can see discussions about each of them in earlier Tuesday Minutess to the right.

As I studied this subject I realized the Nutri-Clear Plus system initiates the process of autophagy. That's why people feel so good. But let's face it some people get physiologically stuck. Understanding and applying some of the principles Whittel shares, particularly as they apply to food and exercise, will give you an added edge to help them.

Thanks for reading this week's Tuesday Minute edition. I'll see you next Tuesday.