



What if I told you that your body eats itself on a daily basis? Yep, you read that right – your body really does cannibalize itself every single day. While that might sound a little wacky and creepy at first, it’s actually a perfectly normal process known as *autophagy*.

And not only is autophagy perfectly normal, but optimizing this unique process might just be the secret to better health, more youthful energy and appearance, and even extending our lifespan. Today we’re going to dive into exactly what autophagy is, how it exerts its impressive health-promoting effects, and explore how we can naturally increase this self-cleansing process.

## What Is Autophagy?

Autophagy (pronounced “ah-TAH-fah-gee”) is derived from Greek prefixes that translate into self-eating (auto = self and phage = eat). So autophagy is quite literally the process of your cells eating themselves. Think of autophagy as your body’s all-natural, built-in recycling process that goes something like this:<sup>1,2</sup>

- Your body contains trillions of cells. Over time these cells can accumulate waste materials and certain cellular components can become old and worn out – making it harder for the cell to properly perform its duties.
- When your cells have an excess of waste or defective cell parts, the cell becomes stressed and unable to function at full capacity.

products of these defunct, worn-out cells.

- Once engulfed, these parts are transported to a part of the cell known as the *lysosome* where they are digested and broken down.
- As these cellular components move through the digestion process within the lysosome they are sorted – with junk parts being disposed of and salvageable parts being recycled as raw materials to make new cell parts.

When you think of autophagy as your built-in recycling system that clears out waste and repurposes old cell parts, it's easy to see why this process is so crucial. And while you certainly don't want an overzealous autophagic response (that can create its own set of unique problems) – generally speaking, increasing cellular autophagy can have some impressive benefits for your health and longevity.

## Benefits of Increasing Autophagy

Optimizing autophagy and increasing your body's ability to eliminate worn-out, malfunctioning cells can have some remarkable effects on your overall well-being. Let's look at some of the most prominent benefits that are linked to optimizing cellular autophagy.

### Anti-Aging Benefits and Enhanced Longevity

In simplest terms, aging is the gradual failure of cellular repair mechanisms that, over time, lead to an accumulation of cellular damage and a loss of cellular function. As you age, your cells simply become less efficient at clearing out old damaged cells and replacing them with new, fresh cells. So as you accumulate more and more cells that are functioning sub-optimally, you subsequently begin to see many of the cardinal signs of aging.

So it makes sense that if we're able to enhance the body's ability to eliminate old, defunct cells we can essentially pump the brakes on the process of aging. In fact, studies have found that increasing autophagy can not only slow the signs of aging and the development of age-related diseases but even has the potential to significantly extend our lifespans.<sup>3,4</sup>

### Anti-Cancer Properties

While the role of autophagy in cancer can be complex, studies have found that increasing autophagy can help combat and/or slow the formation of cancerous cells. You see, when cellular components become old and worn out, the damage can begin spreading – sometimes inducing damage to proteins and even your DNA.

## Improved Immune Function

Autophagy plays a crucial role in minimizing inflammation and keeping your immune system running on all cylinders. Just a handful of the ways that optimizing autophagy can enhance overall immune function include:<sup>7,8,9</sup>

- **Degradation of invading microbes:** Autophagy helps clear invading bacteria, viruses, or parasites that invade your body, by degrading any cells that are infected with these sneaky microbes.
- **Activating pattern recognition receptors (PRRs):** PRRs are specialized receptors found on various immune cells that, when activated, trigger the inflammatory response to appropriately respond to an imminent threat. The signaling proteins released during autophagy activate these PRRs and regulate your immune system's response.
- **Inflammasome regulation:** The inflammasome is a specific immune pathway that can either up-regulate or down-regulate the inflammatory cascade – allowing your immune system to defend itself without going overboard and causing tissue damage or autoimmunity. Autophagy is a main regulator of the inflammasome – playing a crucial role in immune homeostasis and balance.

This is just the tip of the iceberg when it comes to the health benefits of optimizing this fascinating “recycling” process. So what can we do to naturally increase and optimize autophagy?

## What Increases Autophagy the Most?

Autophagy is a natural process that is regularly taking place in the background nearly all the time. But there are some specific steps you take to enhance your body's ability to induce autophagy including:

### Fasting and Calorie Restriction:

Fasting – or the short-term restriction of any caloric intake – is one of the most effective ways to induce autophagy. You see, depriving your cells of nutrients for a period of time pushes them into survival mode – forcing them to induce autophagy and repurpose cellular components to function properly. And there's no need to go extended periods of time without food – studies have found that even fasting for an 18-24 hour window can drastically increase autophagy.<sup>10,11</sup>

### Exercise:

Regular exercise has a plethora of benefits when it comes to your health – including the ability to induce autophagy. Research has found that resistance training, high-intensity interval training, as well as endurance training, can all up-regulate autophagy.<sup>12,13</sup>

autophagy.

While we're still not completely sure how ivermectin is able to induce autophagy, it's speculated that it's likely due to its ability to suppress a complicated cellular pathway known as the Akt/mTOR signaling pathway. Signaling molecules released when this pathway is activated essentially block and inhibit autophagy. So by suppressing the activation of the Akt/mTOR pathway, ivermectin is effectively able to ramp up autophagy.<sup>14,15,16</sup>

## Metformin:

Metformin is another pharmaceutical drug most commonly used as an anti-diabetic agent to treat elevated blood sugars. But Metformin has also been found to be highly useful in other applications – such as slowing the aging process and combatting the growth of cancer cells. These anti-aging and anti-cancer effects are, at least in part, thanks to this medication's ability to induce autophagy.

Metformin can induce autophagy via a number of different signaling pathways – simultaneously promoting pathways that upregulate autophagy while suppressing pathways that inhibit it.<sup>17,18</sup>

## Spermidine:

Spermidine is a naturally-occurring molecule known as a *polyamine* that is produced by nearly all of your cells, synthesized by the microbes in your gut, as well as ingested via many foods you may eat. What's fascinating about spermidine is its ability to mimic the effects of fasting – with increased spermidine levels dramatically increasing autophagy.

This discovery has made spermidine of particular interest in the realm of anti-aging and increasing longevity – with numerous studies finding that increased spermidine intake can delay the development of age-related diseases, help maintain youthful energy and appearance, and extend lifespan.<sup>19,20,21</sup>

## Resveratrol:

Resveratrol is a compound known as a *phenol* that is found in many plants as a protective mechanism – protecting plants against attack by invading pathogens. When ingested, resveratrol serves as a potent antioxidant and regulator of autophagy.

One of the primary ways resveratrol is able to induce autophagy is by directly inhibiting the mTOR pathway. Upregulation of the mTOR pathway inhibits autophagy. So by down-regulating this signaling pathway, resveratrol is able to promote autophagy.<sup>22,23</sup>

your own. Some of the simplest and most effective ways to support and promote optimal autophagy include:

- Incorporate short-term fasting and/or calorie restriction
- Get regular movement and exercise – especially weight training and resistance training
- Increase your intake of resveratrol-rich foods such as grapes, wine, berries, and peanuts
- Consider adding in a resveratrol-containing supplement like [Resveramax](#)
- Increase your intake of spermidine-rich foods like:
  - Aged cheese
  - Cruciferous veggies
  - Mushrooms
  - Fermented soy products (like miso and tempeh)
  - Chicken liver
  - Scallops
  - Green peppers
  - Wheat germ
  - Rice bran
- Incorporate a sulforaphane supplement like [BroccoBoost Plus](#)
- Incorporate spermidine-rich supplements like fermented wheat germ – but ONLY if you are not sensitive to gluten/wheat.

If you need some fresh ideas on how you can incorporate more foods that are high in spermidine and resveratrol, you can head over and [check out my recipe library right here](#). And if you're interested in trying out these autophagy-boosting supplements, you can [get 10% off your first order through my online store by clicking right here](#).

## So, How Important Is Enhancing Autophagy Really?

Autophagy is a crucial process – we literally can't survive for long without it. And finding ways to support and promote optimal autophagy can have some impressive health benefits. But at the end of the day, enhancing autophagy is just a piece of the puzzle.

Optimizing your body's "recycling process" is certainly healthy – but you can't "out-recycle" less-than-ideal lifestyle choices. Creating a well-rounded foundation of well-being through the way you eat, move, sleep, think, and interact with the world is the key to vibrant health and longevity.

**Now it's time to hear from you. Were you surprised to learn just how important autophagy really is? What steps are you taking to optimize autophagy? Leave your questions and thoughts in the comments below!**

Resources:

1. [Autophagy: cellular and molecular mechanisms – PMC \(nih.gov\)](#)
2. [Autophagy: Definition, Process, Fasting & Signs \(clevelandclinic.org\)](#)
3. [Autophagy – An Emerging Anti-Aging Mechanism – PMC \(nih.gov\)](#)
4. [Spermidine delays aging in humans – PMC \(nih.gov\)](#)
5. [The Roles of Autophagy in Cancer – PMC \(nih.gov\)](#)
6. [Autophagy in cancer: moving from understanding mechanism to improving therapy responses in patients | Cell Death & Differentiation \(nature.com\)](#)
7. [Autophagy in the Immune System and in Malignancy | Bio-Rad \(bio-rad-antibodies.com\)](#)
8. [Autophagy and the Immune Response | SpringerLink](#)
9. [Targeting Autophagy to Overcome Human Diseases – PMC \(nih.gov\)](#)
10. [Autophagy: Definition, Process, Fasting & Signs \(clevelandclinic.org\)](#)
11. [Short-term fasting induces profound neuronal autophagy – PMC \(nih.gov\)](#)
12. [Autophagy-Dependent Beneficial Effects of Exercise – PMC \(nih.gov\)](#)
13. [Frontiers | Effects of Physical Exercise on Autophagy and Apoptosis in Aged Brain: Human and Animal Studies \(frontiersin.org\)](#)
14. [The PI3K/AKT/mTOR pathway regulates autophagy to induce apoptosis of alveolar epithelial cells in chronic obstructive pulmonary disease caused by PM2.5 particulate matter – PMC \(nih.gov\)](#)
15. [Ivermectin Induces Cytostatic Autophagy by Blocking the PAK1/Akt Axis in Breast Cancer | Cancer Research | American Association for Cancer Research \(aacrjournals.org\)](#)
16. [Ivermectin induces autophagy-mediated cell death through the AKT/mTOR signaling pathway in glioma cells – PMC \(nih.gov\)](#)
17. [The effects of metformin on autophagy – ScienceDirect](#)
18. [The effects of metformin on autophagy – PubMed \(nih.gov\)](#)
19. [Spermidine: a physiological autophagy inducer acting as an anti-aging vitamin in humans? – PMC \(nih.gov\)](#)
20. [Spermidine delays aging in humans – PMC \(nih.gov\)](#)
21. [Higher spermidine intake is linked to lower mortality: a prospective population-based study – PubMed \(nih.gov\)](#)
22. [Resveratrol As A Natural Regulator Of Autophagy For Prevention And Treatment Of Cancer – PMC \(nih.gov\)](#)