

NAD? NADH? Sirtuins? You might have never heard of them. But they're about to make a big impact on your health.

As the saying goes, it takes two to tango. And that's certainly true when it comes to sirtuins and NAD – two powerful forces in the healthy aging battle. To understand how they work together, along with the combined benefits they deliver, let's take a step back – and a deeper look into a couple of your new health friends. But first, let's better understand exactly what is happening during the normal aging process.

Aging is a complex process that is only beginning to be understood

Why do you age? Why does your skin wrinkle, your hair gray, and your bodies just seem to not function like they did when you were younger? The short answer is no one knows definitively. But there are no shortages of theories as to why you age. Everything from your heart has a predetermined number of beats, to only having so many breaths you can take, to becoming more and more socially isolated the older you get.

But some of the most studied and best understood theories of aging involve what is happening on a cellular level. From exposure to damaging oxidants and free radicals, the "Free Radical Theory of Aging," to declines in certain cellular systems like energy production, the "Mitochondrial Theory of Aging," to another theory that is garnering a lot of attention these days, the "Sirtuin Theory of Aging."

Sirtuins help regulate cellular health

Ok, what are sirtuins and how do they work? We're glad you asked. [Sirtuins](#) are a type of protein. But these aren't dietary proteins that you'd find in beans and meats. Sirtuins are molecules that work within your cells to do a number of different things. Specifically, they're responsible for regulating [cellular health, metabolic regulation, cardiovascular health, DNA expression, and healthy aging](#). In fact, when sirtuins were discovered they were quickly nicknamed "the longevity genes."

It was [Geneticist Dr. Amar Klar](#) who originally discovered sirtuins in the 1970s. But it wasn't until the 1990s that researchers found additional genes similar to [Klar's discovery](#) and they were quickly nicknamed "the longevity genes."

They were looking at the phenomenon of extreme [Caloric Restriction](#). Caloric Restriction is the phenomenon of reducing calories by up to 60 percent. Interestingly, restricting calories so drastically came with such a plethora of health benefits and the animals lived significantly longer. However, the researchers also discovered that when they removed the proteins called sirtuins, Caloric Restriction no longer had the same effects. Meaning sirtuins were essential to unlock these health benefits.

Interestingly, these researchers also discovered that organisms have different numbers of sirtuins. For example, bacteria have one, yeast has five, and mice and humans have seven.

One of sirtuins' primary functions is [autophagy](#), or waste clean up inside the cell. As cells do their daily, natural work, they create waste. If cells are unable to clear or clean out that waste, they become blocked. And more blockage limits their ability to do their work. This is where sirtuins come in. By triggering autophagy, they clear out cellular waste, and as they do, they enable a wide range of benefits. For example:

- Improving mental focus and concentration
- Supporting positive mood and motivation
- Boosting mental and physical energy
- Supporting the body's healthy inflammation response
- Supporting joint health
- Maintaining cholesterol levels already in the healthy range
- Supporting a healthy vascular [system](#)

Sounds great, right? You bet it does. But there's a catch. Like most good things in the body, sirtuin activity declines about 60% as you age. So the question is, is there a way to increase sirtuin activity?

This is where NAD comes in.

Sirtuin activity requires a molecule called NAD

NAD, or nicotinamide adenine dinucleotide, is a cofactor essential for life. And the role NAD plays in anti-aging is important. For starters, NAD coexists in your cells in two forms: 1) a molecule called NAD⁺ and 2) a molecule called NADH. It turns out, it is the ratio of these two forms of NAD (the NAD⁺/NADH ratio) that is important for controlling a number of other cell signaling pathways. As the ratio of NAD⁺/NADH increases, NAD⁺ becomes a signaling molecule itself that has two important functions in the body:

1. It helps turn nutrients into energy
2. It works to regulate the biological activity of other proteins

When it comes to sirtuins and their critical role, they can do nothing without NAD⁺. In other words, the only way that sirtuins work is in the presence of NAD⁺. Knowing that NAD⁺ plays a role in metabolism by turning nutrients into energy and that sirtuins rely on NAD⁺ to function creates a clear link between sirtuins and metabolism. Increasing NAD⁺ levels, isn't just important. It's critical. Especially to help us maintain health as we age.

Sirtuins and NAD⁺ work together to help promote overall health.

You can think of NAD⁺ and sirtuins as the perfect dancing partners. Because NAD⁺ activates sirtuin activity, it's highlighting the critical role that metabolism plays in other biological functions that promote health. The list of health benefits that sirtuins deliver is long, but it doesn't happen without NAD⁺. These two natural components of cellular health are partners for doing incredible good for your bodies. They have the power to help us stay healthy and the future potential for both is exciting as scientists continue to learn more about just how much good they can do for us.