

The background features a complex geometric pattern of overlapping circles and arcs in white and light gray. Scattered throughout are small white and orange circles, some containing a minus sign, and several white plus signs. The overall color scheme transitions from a deep blue at the top to a warm orange at the bottom.

# REDOX & NAD<sup>+</sup>

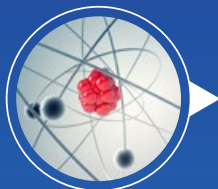
**Unlock the Key to Longevity  
With This  
Revolutionary Approach**

**LifeExtension<sup>+</sup>**  
Stay Healthy, Live Better



### **A Quick Chemistry Class Refresher**

REDOX? NAD+? This all probably sounds a little confusing. So let's take a trip back to high school chemistry class (just for a few minutes!) and review a basic chemical reaction that will help us understand this groundbreaking new strategy for living longer.



### **All Aboard the Electron Shuttle**

An electron shuttle serves as an essential component of any REDOX reaction. Learn about one of our body's most important electron shuttles: Nicotinamide Adenine Dinucleotide. (And don't worry, there's a shorter name for it!)



### **The Many Essential Benefits of NAD+**

As our body's NAD+ levels decrease, we often experience an increase in a variety of age-related health problems. Discover how maintaining optimal levels of NAD+ can help protect you against everything from fatigue to neurodegenerative disorders to heart disease.



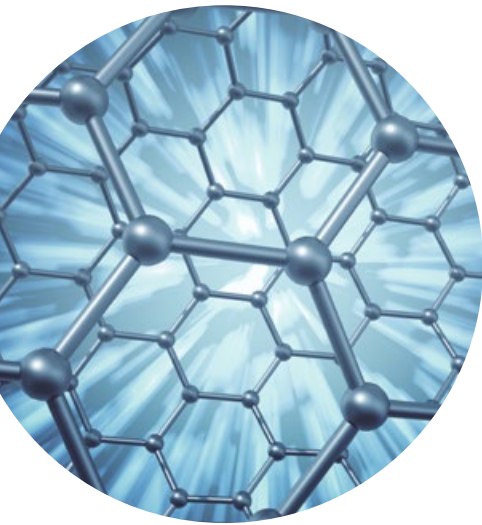
### **A Natural New Way to Boost NAD+ Levels**

Researchers recently made an amazing breakthrough in the field of longevity—a new form of vitamin B3 that could change the way we combat aging. Find out all about this revolutionary anti-aging protection—and what it can do for you!



# #1

## A Quick Chemistry Class Refresher



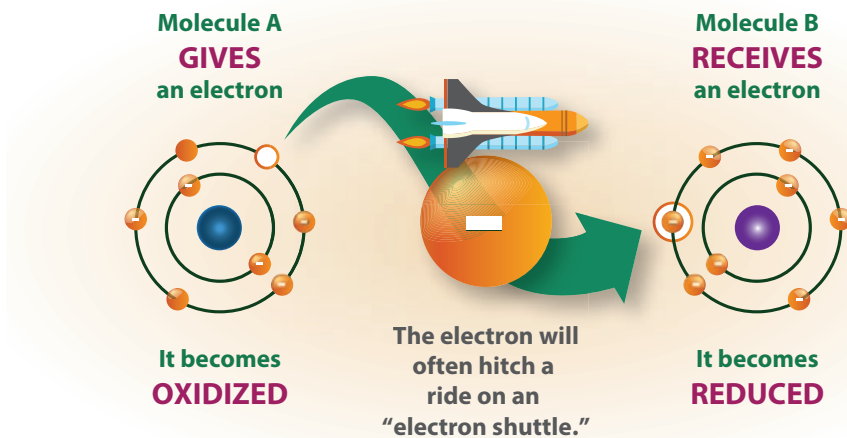
## A Quick Chemistry Class Refresher

Think back to your high school chemistry class. Maybe you remember performing some experiments in the lab ... or listening to the teacher explain the day's lesson. Or maybe you remember just waiting for the bell to ring.

Whatever the case, you probably never considered that what you were learning in chemistry class could help you live longer — but it just might!

In basic chemistry, we learned about a classic chemical reaction called REDOX — which stands for oxidation and reduction. A REDOX reaction involves the transfer of an electron from one molecule to another.

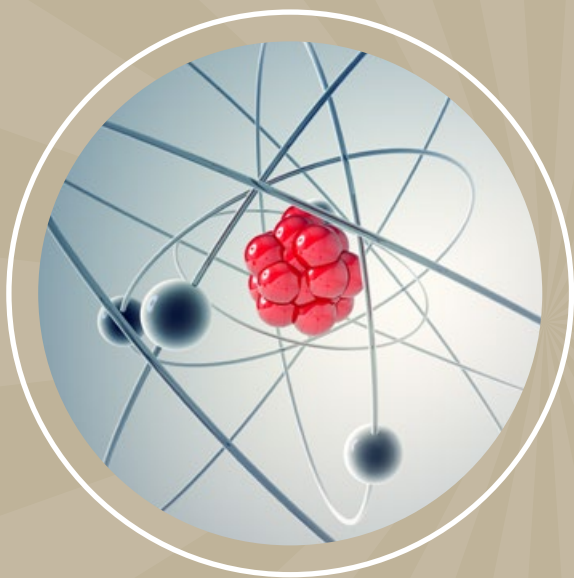
It's a simple process, but these critical reactions power many complex metabolic functions — all of which can **impact human longevity**.



This simple transfer of an electron between molecules fuels life-sustaining metabolic functions, such as producing cellular energy. So by supporting your body's REDOX reactions, you can enhance cellular energy production — an important step for living longer.

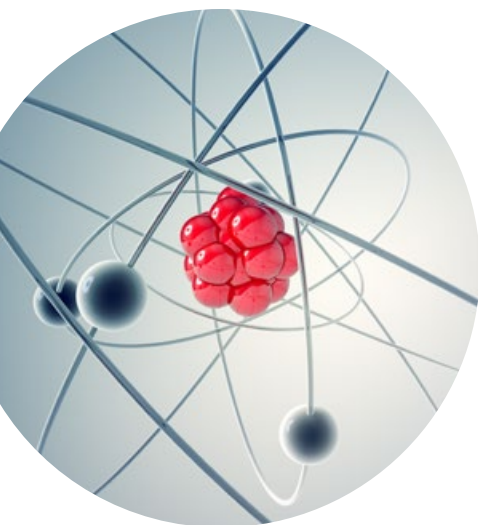
Wow, we did learn something useful in high school chemistry!

Now we're going to take a closer look at the "electron shuttle" — and learn how this essential component holds the key to supporting REDOX reactions.



# #2

**All Aboard the  
Electron Shuttle**



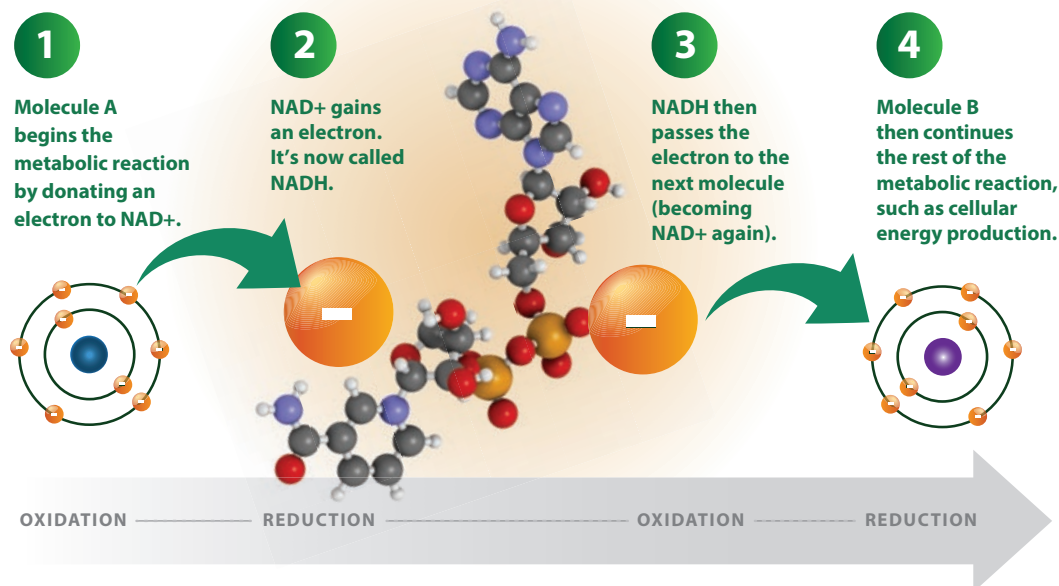
## All Aboard the Electron Shuttle

For an electron to transfer from one molecule to another, it needs to hitch a ride — and that's where the electron shuttle comes in.

One such electron shuttle is a coenzyme that's found in every cell of the body called Nicotinamide Adenine Dinucleotide. That's quite a mouthful, so we'll just call it by its other name: NAD<sup>+</sup>.

Without electron shuttles like NAD<sup>+</sup>, REDOX reactions would not be efficient enough to fuel life-sustaining functions. Let's take another look at a REDOX reaction — but this time in more detail and with the addition of NAD<sup>+</sup>:

**Nicotinamide Adenine Dinucleotide acts as a shuttle for the transfer of electrons.**



**Without NAD<sup>+</sup> facilitating this electron transfer, these REDOX reactions would not be efficient enough to fuel many metabolic reactions.**

So, the more NAD<sup>+</sup> you have, the more efficient the REDOX reactions will be. And the more efficient the REDOX reactions are, the more efficient your metabolic functions will be.

All of that sounds impressive ... but what does it really mean to you? Read on to discover exactly what NAD<sup>+</sup> can do for *your* health and longevity!



# #3

**The Many Essential  
Benefits of NAD+**





**We know how essential NAD<sup>+</sup> is because research has shown that the natural age-related decline in NAD<sup>+</sup> levels can have many negative impacts on our health.**

## The Many Essential Benefits of NAD<sup>+</sup>

Here's a quick recap of what we've learned so far: REDOX reactions fuel life-sustaining metabolic functions, and NAD<sup>+</sup> plays a vital role (as the electron shuttle) in REDOX reactions — making NAD<sup>+</sup> an essential part of life.

In fact, we know how essential NAD<sup>+</sup> is because research has shown that the natural age-related decline in NAD<sup>+</sup> levels can have many negative impacts on our health, including several disorders and symptoms that we typically identify with aging. These include:

- Neurodegeneration in the brain<sup>1</sup>
- Vascular inflammation, which can damage blood vessels and result in a stroke or heart attack<sup>2-4</sup>
- Increased fat storage in the liver, which can lead to non-alcoholic fatty liver disease<sup>5-7</sup>
- Increased fat production and deposition in white adipose tissue, like that found in dangerous belly fat<sup>8,9</sup>
- Insulin resistance, which can cause higher blood sugar levels and lead directly to metabolic syndrome, putting you at increased risk for heart disease, stroke, and diabetes<sup>3,10,11</sup>
- Fatigue<sup>12,13</sup>
- Loss of muscle strength<sup>12,13</sup>
- Fatty infiltration of muscles that deprives them of their normal sources of energy<sup>12,13</sup>

Given all this, perhaps it's no surprise that boosting NAD<sup>+</sup> levels has been shown to reverse key indicators of aging.<sup>14</sup>

In one recent study,<sup>15</sup> researchers showed that NAD<sup>+</sup> fights aging in two distinct ways: It increases cellular energy and it activates two crucial anti-aging enzymes called sirtuins,<sup>16-19</sup> which contribute to longevity by silencing genes that accelerate aging.<sup>1,20-24</sup>

### Boosting Cell Energy Production

Mitochondria, the producer of cellular energy, require optimal levels of NAD<sup>+</sup> in order to function properly.<sup>20,25</sup> That's why a drop in NAD<sup>+</sup> levels can lead to mitochondrial dysfunction, which can then result in many of the physical symptoms of aging.<sup>1,14,26</sup>

Fortunately, studies have shown that by increasing the body's levels of NAD<sup>+</sup>, mitochondrial dysfunction—and the aging process itself—can be reversed.<sup>14</sup>



One of the anti-aging sirtuins that NAD<sup>+</sup> activates is called SIRT3. Primarily located in the mitochondria, SIRT3 plays an important role in the regulation of several mitochondrial processes<sup>27</sup> and has been shown to:

- Protect against:
  - obesity<sup>28</sup>
  - fatty liver<sup>28</sup>
  - high cholesterol<sup>28</sup>
  - insulin resistance<sup>28</sup>
- Improve stem cell regeneration<sup>29</sup>
- Play a neuroprotective role in neurodegenerative disorders like Huntington's disease<sup>30</sup>

### Promoting longevity

Like SIRT3, the sirtuin SIRT1 depends on NAD<sup>+</sup> in order to perform its life-giving functions—and it also plays a crucial role in the aging process. In fact, several studies have shown the influence of SIRT1 activity on extending life span.<sup>31,32</sup>

SIRT1 promotes longevity by helping to:

- Regulate and protect against premature cellular senescence, a process that contributes to accelerated aging<sup>33,34</sup>
- Protect against neurodegenerative disorders and age-related cognitive decline<sup>35–37</sup>
- Regulate metabolism<sup>33</sup>
- Maintain stem cells<sup>38</sup>
- Improve muscle performance<sup>39</sup>
- Reduce the incidence of cancer<sup>27,31</sup>
- Improve glucose control<sup>31</sup>
- Improve wound healing<sup>31</sup>
- Delay bone loss<sup>31</sup>
- Protect against endothelial dysfunction<sup>33</sup>

So now we know that fighting off the effects of aging requires optimal levels of NAD<sup>+</sup>. But if NAD<sup>+</sup> levels naturally decrease with age, what can we do about it? As it turns out, there's a remarkable new compound that can help us restore our body's healthy, youthful NAD<sup>+</sup> levels.

SIRT3

SIRT1



**There's a remarkable new compound that can help us restore our body's healthy, youthful NAD<sup>+</sup> levels.**



# #4

A Natural New  
Way to Boost  
NAD+ Levels

## A Natural New Way to Boost NAD<sup>+</sup> Levels

Many scientists believe that maintaining our NAD<sup>+</sup> levels could be the key to slowing, stopping, or even reversing the aging process. And extensive research on the topic recently led to an exciting breakthrough.

Researchers discovered how to restore higher levels of NAD<sup>+</sup> through the use of a unique form of vitamin B3 called nicotinamide riboside. This compound converts to NAD<sup>+</sup> in the body,<sup>40,41</sup> allowing aging individuals to boost their NAD<sup>+</sup> cellular levels with regular supplementation.

Vitamin B3 plays a role in over 400 enzymatic reactions throughout the body and is crucial for cellular energy production and management.<sup>42</sup> By increasing our body's NAD<sup>+</sup> levels, the nicotinamide riboside form of B3 can provide a wide array of anti-aging benefits. What's more, it does this without the skin flushing and rash caused by standard forms of vitamin B3.<sup>41</sup>

Studies have demonstrated the various benefits of nicotinamide riboside, including:<sup>21,43</sup>

- Switching “off” the genes of aging
- Extending life span
- Increasing endurance
- Improving cognitive function
- Activating sirtuins
- Enhancing cellular energy

A groundbreaking advance in the field of longevity, nicotinamide riboside supplementation can help you prevent the effects of aging—and promote youthful vitality—throughout your entire body.



**Nicotinamide riboside converts to NAD<sup>+</sup> in the body, allowing aging individuals to boost their NAD<sup>+</sup> cellular levels with regular supplementation.**



A Quick Chemistry  
Class Refresher



All Aboard the  
Electron Shuttle



The Many Essential  
Benefits of NAD<sup>+</sup>

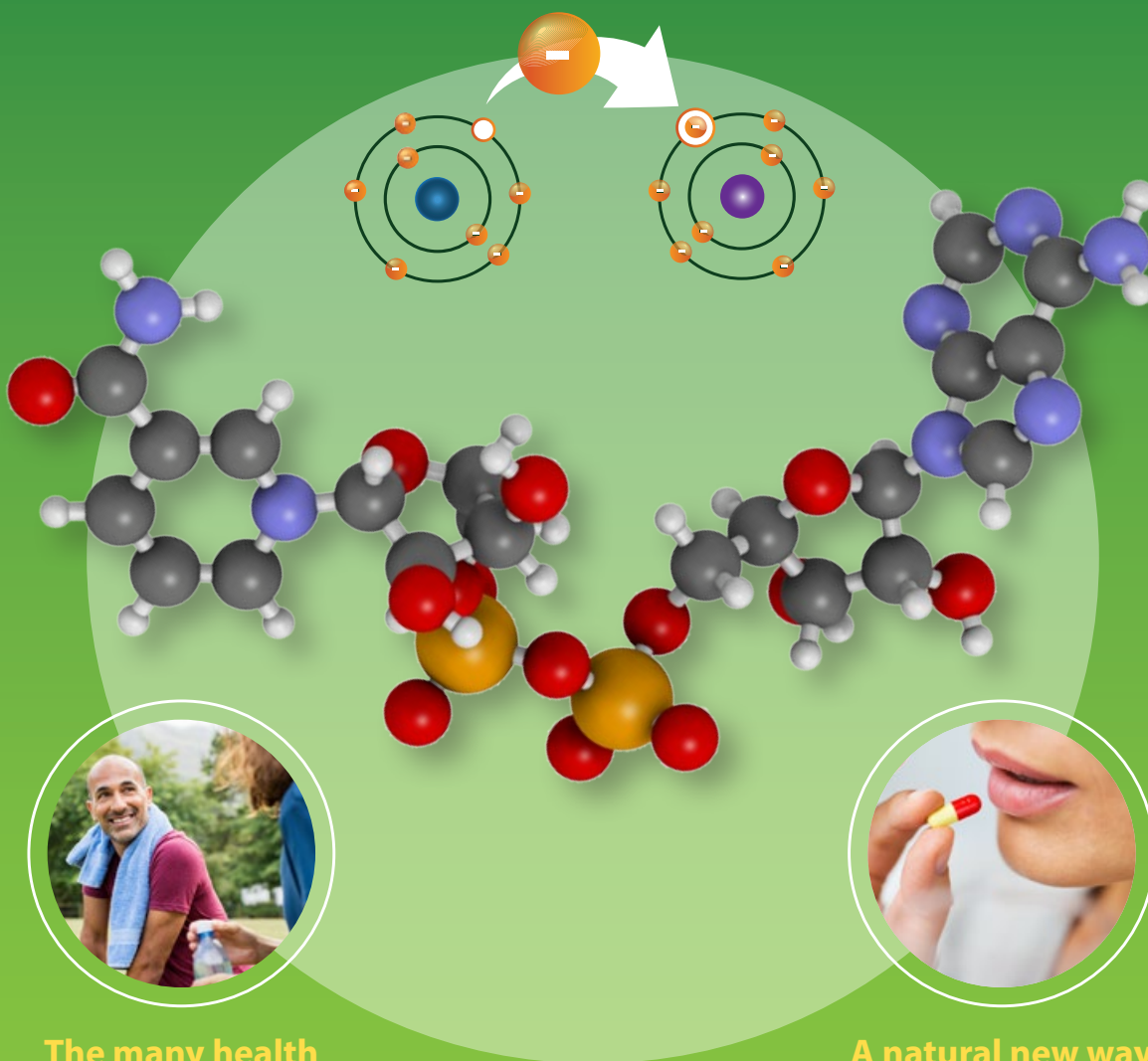


**A Natural New  
Way to Boost  
NAD<sup>+</sup> Levels**

# Unlocking the Key to Longevity with NAD<sup>+</sup>

## NAD<sup>+</sup> assists in REDOX reactions

NAD<sup>+</sup> acts as an electron shuttle in REDOX reactions, allowing for more efficiency in those reactions. And the more efficient the REDOX reactions are, the more efficient your metabolic functions will be.



## The many health benefits of NAD<sup>+</sup>

Boosting NAD<sup>+</sup> levels has been shown to reverse key indicators of aging.<sup>14</sup> It increases cellular energy and it activates two crucial anti-aging enzymes called sirtuins,<sup>16-19</sup> which contribute to longevity by silencing genes that accelerate aging.<sup>1,20-24</sup>

## A natural new way to boost NAD<sup>+</sup> levels

A groundbreaking advance in the field of longevity, nicotinamide riboside supplementation can help you prevent the effects of aging—and promote youthful vitality—throughout your entire body.

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