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COVER STORY

Brain-Restoring Impact of Magnesium L-Threonate

By Susan Goldschein

MIT researchers discovered and patented **magnesium L-threonate** based on its unique ability to boost **brain** levels of **magnesium**.

Rapid absorption and ability to **enter the brain** enables this **magnesium** to structurally reverse certain aspects of **brain aging**.¹⁻⁴

A recent **human** study demonstrates the benefits of **magnesium L-threonate** in adults with **cognitive dysfunction, sleep disorders, and anxiety**.¹

The most startling finding is a reversal of more than **nine years** in clinical measures of **brain aging** in people who supplemented with **magnesium L-threonate**.

Magnesium L-threonate (MgT) was developed at the Massachusetts Institute of Technology.²

MgT (pronounced “Mag T”) is special because of the way it boosts brain magnesium levels when taken orally. This effect is due to its unique ability to cross the **blood-brain barrier**.²

Research has shown that once **MgT** gets into the brain, it increases the **density** of **synapses**, which are the communication **connections** between brain cells.¹

This is critical because loss of **synaptic density** is associated with **brain shrinkage** and **cognitive decline**.^{5,6}

WHAT YOU NEED TO KNOW

- A new human study using a unique, highly-available form of magnesium, magnesium-L-threonate, or MgT, shows that 12-week administration not only boosts performance on individual cognitive tests, but also **reverses brain aging** by more than nine years in older adults with cognitive impairment.
- Our brains shrink as we age, victims of steady declines in the numbers and functions of our brain cells and their cerebral “switchboards” known as synapses.
- Loss of those synapses is currently the best predictor of cognitive decline, the slowing and wandering of our wits as we age.
- Scientists now believe that preventing the loss of synapses, and promoting their density, has incredible potential for preventing cognitive decline.
- Animal studies confirm that MgT has remarkable capacity to promote new synapse formation and enhance plasticity in ways that preserve youthful brain function.

- We only get one brain apiece to last our entire lives – MgT supplementation appears to be indispensable in preserving our best brain function.

Published Human Data



Scientists at three independent institutions carried out a randomized, double-blind, placebo-controlled clinical trial of **MgT** in older adults with cognitive impairment.¹

To participate in the study, candidates had to be between the ages of 50 and 70, and have self-reported complaints of memory problems, sleep disorders, and anxiety.¹

This study was based on the premise that **sleep** and **anxiety** disorders correlate with perceived **memory loss**.⁷ Those who report **mild cognitive impairment** and who also have **sleep** and **anxiety** disorders are more likely to develop **Alzheimer's**.^{1,8-11}

In this multi-center study, participants were randomly assigned to receive **placebo** or **magnesium L-threonate** in the dose of **1,500-2,000 mg** each day (depending on body weight) for 12 weeks.

Baseline **cognitive testing** commenced before people started taking **MgT** or **placebo**. These cognitive tests were then repeated at six-week and 12-week points.¹

The following four separate tests were used to evaluate cognitive function:

- Executive function
- Working memory
- Attention
- Episodic memory (ability to recall fleeting events)

Findings from this study revealed:

1. MgT improved body magnesium status. After 12 weeks researchers found significant increases in red blood-cell concentration and in urinary excretion of magnesium in the treated group.¹ Increased urinary excretion indicates that large amounts of magnesium have been absorbed, while increased levels in red blood cells show high circulating levels of magnesium in the body.

2. MgT improved cognitive abilities. Using a test of visual attention and task switching, researchers saw significant increases in performance speed for executive function and cognitive processing. These benefits appeared as early as week six on some of the tests.¹ Most tellingly, the overall composite scores for all tests of the **MgT**-supplemented group increased significantly compared with baseline scores and with those of placebo recipients at weeks six and 12.

3. MgT reduced fluctuation in cognitive ability. When cognitive functions are worse on some days than others, it is a warning sign of developing mild cognitive impairment.^{12,13} In the present study, while placebo recipients showed considerable fluctuation in their cognitive scores, those in the **MgT** group had primarily positive changes.¹

4. MgT reversed clinical measures of brain aging. This is a significant finding, which we'll explain in more detail in the next section.

Understanding Your Brain Age

Brains do not **functionally** age at the same rate as whole-body **chronological** age.

For example, a **60-year-old** person can have a brain age of **70**, meaning they are **functioning** at an "older" level.¹

This variance of brain aging is based on measurable performance and physiological parameters.¹⁴⁻¹⁷

In the **MgT** study discussed earlier, the average **chronological age** of all subjects in the study was **57.8 years**. Their average baseline "**functional**" brain age, however, was estimated to be **68.3 years**.

In other words, the study subjects were about **10 years older** in terms of their **cognitive function**.¹

What the researchers found next was remarkable.

The average functional brain age of subjects receiving **MgT** supplements **decreased** from an older **69.6 years** at the start of the study, to **60.6** after just six weeks of treatment.

That's a **nine-year reduction** in **brain age** in a matter of weeks.¹ This improvement continued until week 12 with total reduction in brain age of **9.4 years**.

By the end of the study, **cognitive abilities** were brought almost back to normal for their **younger** chronological age in subjects who took **MgT**.

In other words, MgT treatment was found to reverse these measured aspects of **brain aging** until it was nearly identical to their cognitively healthy peers.¹

Overall, the results of this clinical trial are potentially game-changing for the aging population. The study found that MgT significantly improved cognitive performance on several standardized tests, while reducing the fluctuations in performance that are a warning of developing cognitive impairment in the future.

It also showed a reversal of the **brain age** of **MgT**-supplemented subjects by nearly a **decade**.

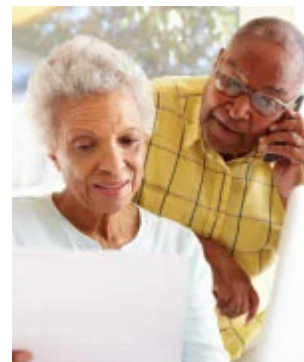
How MgT Regenerates Aging Brains

The study detailed above shows that **MgT** improved cognitive function in aging adults, and helped "rejuvenate" their brains towards normal function for their age.

The key takeaway of this study is that achieving higher **brain levels** of **magnesium** results in a **younger** brain.

Previous studies give us insight into how. They demonstrate that increasing magnesium concentrations in cultured brain cells from the hippocampus (the area of the brain where memories are stored and retrieved) increases both **synaptic density** and **brain plasticity**.^{18,19}

Here's why this is important:



- **Synaptic density** is a measure of the structural integrity of brain **synapses**. The greater the synaptic density, the more efficient the cognitive processing.²⁰
- **Plasticity** is a measure of how readily synaptic connections can change with new stimuli. It is the equivalent of learning at the cellular level.²¹⁻²⁴

Getting more magnesium into brain cells is not as simple as adding it to the diet. That's because of the complex regulatory functions of the blood-brain barrier.^{2,25}

As a result, consuming a typical magnesium compound rather than **magnesium L-threonate** (MgT) doesn't affect brain functions like cognition and memory because much of it does not reach the brain.² In fact, studies show that raising human blood magnesium levels **300%** changes magnesium in cerebrospinal fluid by less than **19%**.²⁶

Research shows that **MgT** increases **synaptic density** in precisely the brain regions most crucial to executive function and memory.²⁻⁴ These are the two most critical processes in something as simple as recognizing that a red light means "stop."

Studies in aging rats and in a mouse model of Alzheimer's disease have also shown that MgT enhances synaptic plasticity and is capable of reversing cognitive impairment.^{2,4}

Overcoming Anxiety

Animal studies demonstrate that MgT helps reduce fear-related memories, and prevents fear memories from becoming over-generalized—actions that contribute directly to reductions in **anxiety**.^{3,27}

While fear plays an important role in keeping us safe from real threats, persistent fearful memories from a specific traumatic occurrence, such as a car accident, can cause us to become anxious and even paralyzed into inactivity.^{3,27,28}

A supplement like MgT that can squelch fearful memories, while also helping our brains put them into context, represents a real step forward in addressing debilitating elements of brain aging.

Summary



The mineral **magnesium** has emerged as a major contributor to the integrity of microscopic **synaptic** structures of the brain.

But getting high amounts of magnesium into the brain is complicated because it has difficulty penetrating the **blood-brain barrier**.

Magnesium L-threonate, or **MgT**, is unique because it enters the brain more efficiently and reaches brain cells, offering a novel delivery system for this valuable neurochemical.

In a remarkable **human** study, MgT was found not only to effectively boost brain magnesium concentrations, but also to significantly improve performance and speed on a battery of cognitive tests in adults with early cognitive impairment.

Even more dramatically, MgT supplementation reduced brain age by more than **nine years**. That represents a **reversal** in these clinical measures of brain aging.

MgT is available as a dietary supplement for anyone interested in proactive brain-aging protection.

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

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