

# **A diet of essential amino acids could keep dementia at bay**

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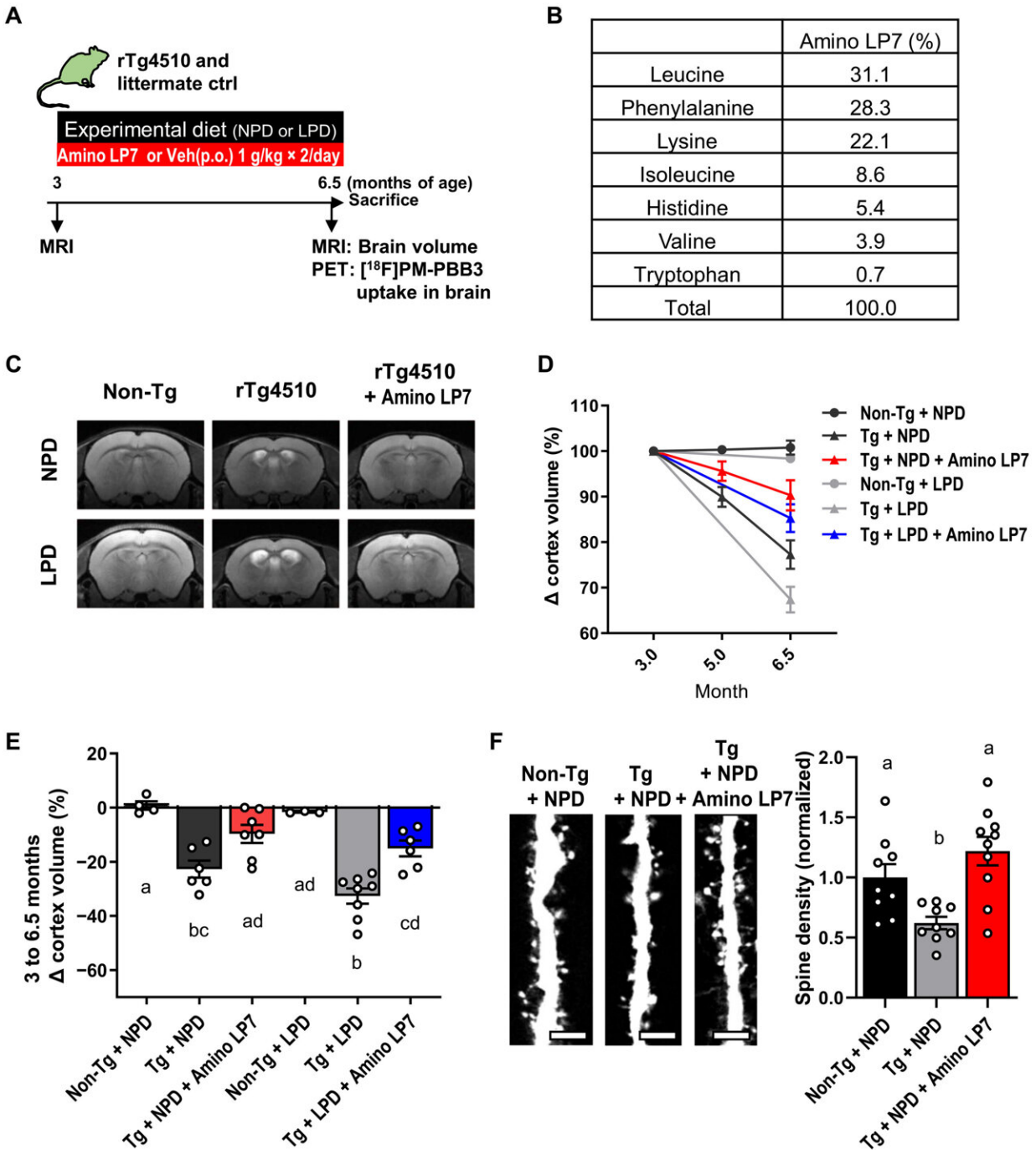


Fig. 1. Neurodegenerative processes in rTg4510 mice are accelerated by an LPD and ameliorated by Amino LP7. (A) Schematic diagram of the experimental procedure. p.o., per os. (B) Composition of Amino LP7. (C to E) Representative coronal MR images (C), time course of cortex volume alterations ( $\Delta$ cortex volume) (D), and summary of  $\Delta$ cortex volume at 6.5 months (E) of mice in six conditions: rTg4510 mice or their littermate controls under NPD or LPD with or

without Amino LP7 administration ( $n = 3$  to  $8$  for each condition). Analysis of variance (ANOVA) [ $F_{(5,28)} = 16.98$ ,  $P_{(2,25)} = 9.19$ ,  $P = 0.001$ ] with Tukey's post hoc test was used. All data are expressed as the means  $\pm$  SEM. Points represent individual animals. The difference between the means is not statistically significant ( $P \geq 0.05$ ) for all groups with the same alphabetical symbols and is statistically significant ( $P$

Dementia—a condition involving the extreme loss of cognitive function—is caused by a variety of disorders, including Alzheimer's disease. According to World Health Organization estimates, approximately 10 million individuals worldwide develop dementia every year, indicating the high psychological and social impact of this condition. Dementia mainly affects older people, and so far, simple and effective strategies for preventing this condition have remained elusive.

In a recent [study published in \*Science Advances\*](#), Japanese researchers showed that a [low protein diet](#) can accelerate [brain](#) degeneration in mouse models of Alzheimer's disease. More importantly, they found that Amino LP7—a supplement containing seven specific [amino acids](#)—can slow down brain degeneration and dementia development in these animals. Their work expands on previous studies, which have demonstrated the effectiveness of Amino LP7 in improving cognitive function.

Dr. Makoto Higuchi from the National Institutes for Quantum Sciences and Technology, one of the lead scientists on the study, explains, "In older individuals, low protein diets are linked to poor maintenance of brain function. Amino acids are the building blocks of proteins. So, we wanted to understand whether supplementation with essential amino acids can protect the brains of [older people](#) from dementia, and if yes, what mechanisms would contribute to this protective effect."

First, the researchers studied how a low protein diet affects the brain in mouse models of Alzheimer's disease, which generally demonstrate neurodegeneration and abnormal protein aggregates called "Tau" aggregates in the brain. They found that mice consuming a low protein diet not only showed accelerated brain degeneration but also had signs of poor neuronal connectivity. Interestingly,

these effects were reversed after supplementation with Amino LP7, indicating that the combination of seven specific amino acids could inhibit brain damage.

Next, the research team examined how Amino LP7 affects different signs of brain degeneration in the Alzheimer's model. Untreated mice showed high levels of progressive brain degeneration, but Amino LP7 treatment suppressed neuronal death and thereby reduced brain degeneration, even though the Tau aggregates remained. According to Dr. Akihiko Kitamura, who also led this study, "Tau plaques in the brain are characteristic of Alzheimer's and most treatments target them. However, we have shown that it is possible to overcome this Tau deposition and prevent brain atrophy via supplementation with Amino LP7."

Next, to understand how Amino LP7 protects the brain, the researchers comprehensively analyzed the gene-level changes induced by Amino LP7. Their findings were quite encouraging. They observed that Amino LP7 reduces brain inflammation and also prevents kynurenine, an inflammation inducer, from entering the brain, thereby preventing inflammatory immune cells from attacking neurons. They also found that Amino LP7 reduces neuronal death and improves neuronal connectivity, improving brain function.

"These results suggest that [essential amino acids](#) can help maintain balance in the brain and prevent brain deterioration. Our study is the first to report that specific amino acids can hinder the development of dementia," say Dr. Hideaki Sato and Dr. Yuhei Takado, both of whom majorly contributed to the study. "Although our study was performed in mice, it brings hope that amino [acid](#) intake could also modify the development of dementias in humans, including Alzheimer's disease," they add.

The study by this research group throws open several avenues for better understanding how dementias occur and how they can be prevented. Given that Amino LP7 improves brain function in older people without cognitive impairment, their findings suggest that it could also be effective in people with cognitive dysfunction.

Indeed, this patent-pending supplement could one day help millions worldwide live an improved, [dementia](#)-free life.

**More information:** Hideaki Sato et al, Neurodegenerative processes accelerated by protein malnutrition and decelerated by essential amino acids in a tauopathy mouse model, *Science Advances* (2021). DOI: [10.1126/sciadv.abd5046](https://doi.org/10.1126/sciadv.abd5046) . [www.science.org/doi/10.1126/sciadv.abd5046](https://www.science.org/doi/10.1126/sciadv.abd5046)

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