

# When mice with Alzheimer's inhaled menthol, their cognitive abilities improved

June 12 2024, by Emily Spencer

---



Credit: CC0 Public Domain

Imagine a future where the smell of menthol could alleviate some of the

worst symptoms of Alzheimer's disease. This might sound like science fiction, but innovative new research is making it a potential reality.

Scientists [have discovered](#) that when [mice](#) with Alzheimer's inhaled [menthol](#), their cognitive abilities improved. This unexpected finding highlights a potential new avenue for treating this debilitating condition.

Alzheimer's disease is a serious [neurodegenerative](#) disorder that gets worse over time. It is characterized by [changes in the brain](#) that result in loss of neurons and connections.

It affects everyone differently, but the most [common symptoms](#) include a gradual decline in memory, thinking and [social skills](#), and frequent mood changes. This can affect a person's ability to learn new things, carry out daily tasks, recognize family and friends and, eventually, live independently.

[Recent figures](#) show that 55 million people worldwide are living with Alzheimer's disease and other forms of dementia. With the populations of many countries [aging rapidly](#), this number is only expected to rise.

There are 10 million new cases of Alzheimer's and dementia each year—a new case every 3.2 seconds. This has led experts to [estimate](#) that over 150 million people will have the disease by 2050. At any rate, Alzheimer's is one of the biggest challenges facing public health in the 21st century.

Fortunately, scientists are now working on so-called ["disease-modifying"](#) drugs that can slow or potentially cure Alzheimer's. Most current treatments just manage symptoms.

## Of mice and menthol

In the new study mentioned above, researchers set out to examine the interactions between the [olfactory](#), [immune](#) and [central nervous systems](#). In their [previous study](#) they found that repeated exposure to menthol enhanced the immune response in mice. Here, the team focused on whether it could improve their [cognitive abilities](#) as well.

During this study, mice that were genetically modified to exhibit Alzheimer's were repeatedly exposed to menthol for six months. The researchers analyzed their [immune response](#) and cognitive capacity and compared them with healthy mice. Surprisingly, mice with Alzheimer's showed a significant improvement following short exposures to the minty-smelling substance.

Specifically, menthol helped to regulate the immune system, prevent cognitive deterioration, and improved memory and learning capabilities.

Researchers found that it lowered levels of [interleukin-1 beta](#), a protein linked to memory problems in Alzheimer's disease. This protein, or "[cytokine](#)" causes inflammation in the brain, which can harm cognitive function. Lowering interleukin-1 beta can help reduce this inflammation and prevent further cognitive decline.

Menthol was also found to mimic the effects of artificially reducing [T-regulatory cells](#)—[immune cells](#) that help control inflammation and keep the immune system balanced. This finding suggests a possible treatment pathway for conditions like Alzheimer's and highlights the potential for particular smells to be used as therapies.

[Previous research](#) has established links between smells and our immune and nervous systems, and we already know that [smells can influence our cognition](#). For example, by triggering emotions and memories.

In addition, it is now known that certain diseases related to the central

nervous system—for example, Alzheimer's, [Parkinson's](#) and [schizophrenia](#)—sometimes come with a loss of smell. While the complexities of these relationships remain unclear, this new research adds some promising data that will help us better understand them.

These results are based on initial observations of lab mice and so can't be generalized to human Alzheimer's patients. Not only are our brains wired differently from mice, but it is not clear how our olfactory systems or perception of odors may differ. However, until the effects of menthol are studied using a human sample, this is a crucial first step towards developing a greater understanding of how to treat the disease.

Further research is needed to investigate the link between Alzheimer's and smell, and this could lead to some interesting techniques. For example, using [smell training](#) as a treatment for managing, or even delaying the onset of Alzheimer's.

For now, though, this piece of research provides us with some interesting findings concerning the relationship between the immune system and brain function, and hope for those affected by this disease.

This article is republished from [The Conversation](#) under a Creative Commons license. Read the [original article](#).

Provided by The Conversation

Citation: When mice with Alzheimer's inhaled menthol, their cognitive abilities improved (2024, June 12) retrieved 26 June 2024 from <https://medicalxpress.com/news/2024-06-mice-alzheimer-inhaled-menthol-cognitive.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.