

# Neuroscientists target Alzheimer’s “silent stage”

Research exploring the first visible changes in the brain is helping scientists evaluate new potential treatments for Alzheimer’s.

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The latest research into what is known as the “silent stage” of Alzheimer’s disease has prompted many experts to believe that early intervention may offer the best chance of therapeutic success.

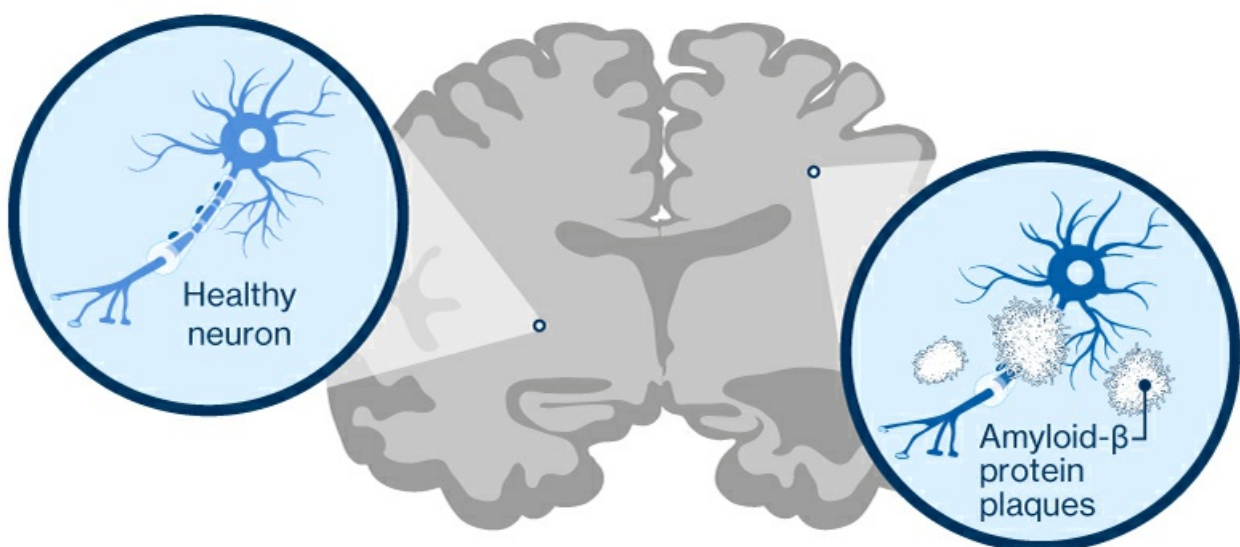
The “silent stage” of Alzheimer’s concerns what goes on inside the brain before symptoms appear and is today a major focus of current research. Neuroscientists are particularly interested in the different types of protein that build up in the brain, sometimes 20 years before Alzheimer’s symptoms appear. These proteins cause damage to the neurons we need to remain cognitively healthy.

[Developing treatments for Alzheimer’s disease is] a bit like solving a jigsaw puzzle without knowing what the end result needs to look like.

**Pierre N. Tariot**, co-director of the Alzheimer’s Prevention Initiative and director of Banner Alzheimer’s Institute

## Intervening early

The appearance of one of the proteins known as amyloid is the first visible change in the brain and is the basis of a leading hypothesis for treatment research. The next visible change is the buildup of the protein tau, in what are known as tau tangles. Once these appear, Alzheimer’s symptoms typically follow.



The appearance of amyloid plaques in the brain is the first visible sign of Alzheimer’s.

Experimental treatments for Alzheimer's put the amyloid hypothesis to the test. "If we can interfere with the production of abnormal forms of amyloid using disease-modifying treatments and stop them from forming harmful plaques in the brain, we may be able to delay the onset, slow the progression, or even stop Alzheimer's from developing," says Dr. Pierre N. Tariot, co-director of the Alzheimer's Prevention Initiative and director of Banner Alzheimer's Institute.

## Testing the amyloid hypothesis

"As it's still unknown what causes Alzheimer's, we can't yet diagnose it at a preclinical stage. This makes the job of developing effective treatments particularly challenging – a bit like solving a jigsaw puzzle without knowing what the end result needs to look like," Dr. Tariot explains. The fact that a person does not show clinical signs of Alzheimer's does not mean that he or she won't go on to develop the disease. There are some initial thoughts on how to diagnose Alzheimer's at the preclinical stage, but these are premature. Science teaches us that we need to focus our research on people who are at a well-defined risk of Alzheimer's.

As with many other areas of medicine, genetics are instrumental in accelerating research. The idea that hidden within us lie essential clues to what may cause and affect Alzheimer's gives scientists direction.

Technology is used to search for these clues. The discovery of new biomarkers – snippets of genetic material – may serve as an early warning sign to diagnose the condition and follow its progression and response to treatment.

In addition to increased understanding and awareness of Alzheimer's risk factors, continuous research is essential for progressing Alzheimer's prevention efforts. According to Dr. Tariot, "It's only through rigorous scientific research – the process of formulating hypotheses, making logical predictions based on them, and then carrying out experiments based on those predictions – that we will make the advances that are needed."

## Recruiting for a trial focused on prevention

Researchers are testing early interventions in genetically high-risk older adults before symptoms appear. A current research program designed collaboratively by Novartis, Amgen and Banner Alzheimer's Institute is actively recruiting 3 000 adults aged 60-75 with a higher genetic risk of developing Alzheimer's.

As our knowledge of Alzheimer's evolves, it's important to look toward the future implications of targeting prevention programs in people who don't yet have symptoms. There are many controversies when dealing with risk instead of symptomatic disease. However, this is often the premise of early medicine and requires strong collaboration and commitment.

A big believer in expanding collaboration to help tackle Alzheimer's disease, Danny Bar-Zohar heads up global neuroscience at Novartis and recognizes the need for a long-term approach. "While it's too early to determine the success of ongoing research, every study contributes to the body of knowledge that brings us closer to a solution," he says. "And while change doesn't happen overnight, if we stay focused on our goals, we will move in the right direction."

Learn how collaborative neuroscience research is helping target the "silent stage" of Alzheimer's.

## Living with Alzheimer's

Read our story of a fitness trainer who strives to keep his mother's mind limber as she lives with Alzheimer's.

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