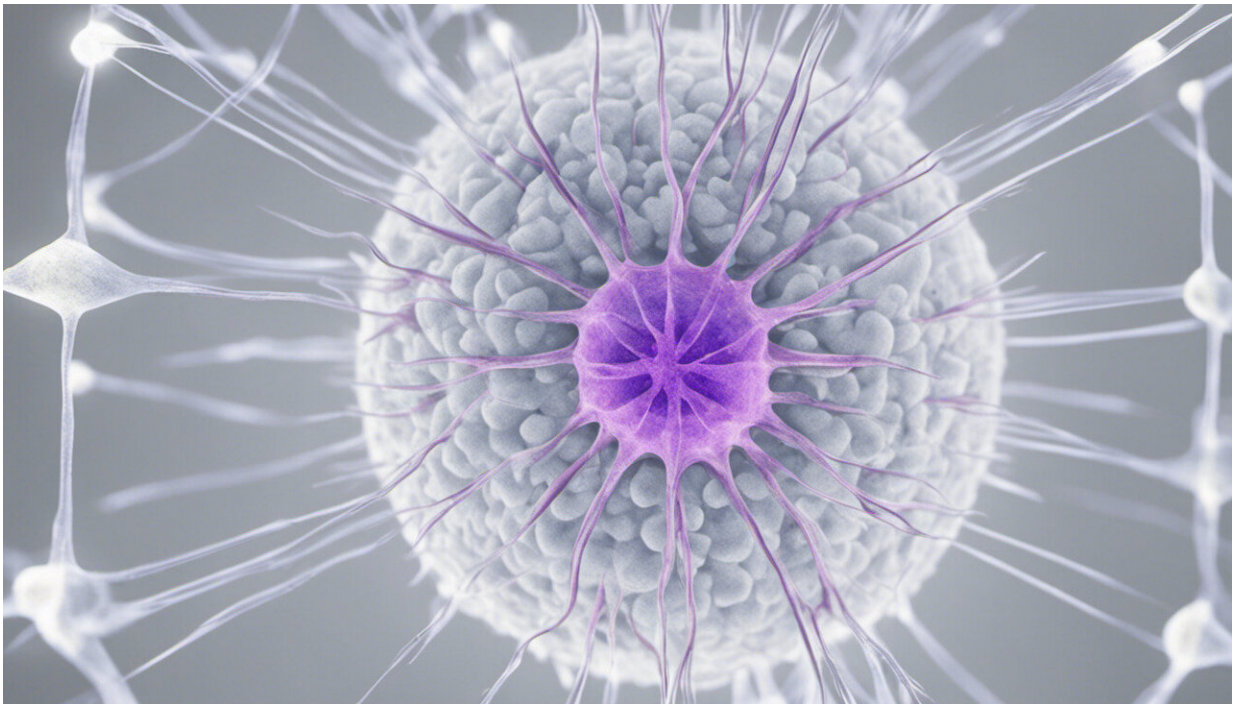


Scientists shift goals in Alzheimer's research to focus on prevention

July 16 2019, by Emily Gersema



Credit: AI-generated image ([disclaimer](#))

After more than 100 years of research on Alzheimer's disease, scientists are beginning to believe that a cure is not achievable.

"The idea that there is going to be one drug that fixes all this seems more and more unlikely. It is a multifactorial disease," said Margaret Gatz,

professor of psychology at USC Dornsife College of Letters, Arts and Sciences.

Although sticky amyloid plaques and tangles in the brain are an obvious Alzheimer's hallmark, they are not the sole factors behind the memory-erasing illness, which affects more than 5 million Americans.

The search for solutions is urgent amid an aging baby boomer population. U.S. annual costs associated with Alzheimer's disease are projected to increase from \$307 billion to \$1.5 trillion by 2050, according to research by the USC Schaeffer Center for Health Policy and Economics and USC Leonard Davis School of Gerontology.

Researchers at USC Dornsife have identified a host of factors that raise the risk for the disease that could be potential targets for treatment or prevention. Many are presenting their latest findings July 14–18 at the Alzheimer's Association International Conference in Los Angeles.

"USC's angle on this is that we need to incorporate things other than just amyloid and tau, such as vascular and inflammatory contributors," said Daniel Nation, associate professor of psychology at USC Dornsife. "And that treatment may need to target, more generally, how to sustain brain health and how to stop neurodegeneration."

A broad approach to treatment requires an interdisciplinary approach to research. At USC, Alzheimer's research involves a cross-collaboration of scientists from biological and computational sciences, economics, environmental science, genetics, gerontology, medicine, neuroscience, psychology and policy. Together, they may have the right amount of fire power to curb Alzheimer's disease.

One disease, many contributors

Working with data from the Swedish Twin Registry and other [large data sets](#), Gatz has found anxiety appears to raise risk for the disease. In addition, she has found that someone who develops type 2 diabetes in middle age also has a significant risk factor for Alzheimer's disease.

Meanwhile, Caleb Finch, University Professor at USC Leonard Davis School of Gerontology and USC Dornsife, has found that pollution exposure raises the risk of developing Alzheimer's, particularly among older women.

Several USC Dornsife researchers are focused on gender differences. Women are at greater risk of developing Alzheimer's than men because of their longer lifespans, Gatz said, but other factors may also be in effect. To answer this question, Christopher Beam, assistant professor of psychology and gerontology, is studying whether certain levels of hormones, or early life exposure to them, may protect some women from developing the disease.

Many countries including the United States have large studies that track aging populations. However, some of the studies stop short of identifying whether or not someone has dementia or Alzheimer's, even though the data sets include cognitive and memory results that could serve as a marker for who is likely to have the disease.

Susan Luczak, a research professor of psychology at USC Dornsife, is working with Beam and Gatz to develop a score that would indicate, based on a constellation of symptoms, whether or not dementia is developing and, if so, its severity. Ultimately, having such a proxy for all of these studies would help scientists compare the different data sets on the basis of memory, cognitive abilities and the participants' ability to function in everyday life.

Genetic risks

Certain genes—including the ApoE4 gene—can significantly raise the risk. For instance, Gatz noted that someone with the ApoE4 gene and cardiovascular disease has a significant risk of developing Alzheimer's disease. However, another gene, TOMM40, may be even more influential than ApoE4 in memory loss, according to work by Carol Prescott, professor of psychology and gerontology at USC Dornsife, and T. Em Arpawong of USC Leonard Davis School.

However, genes are not the only reason someone may develop a disease or become immune to it. The location of someone's home, their line of work, years of schooling, or even their own mental health may affect whether or not Alzheimer's is in the cards.

Titus Galama, an associate professor of economics at USC Dornsife's Center for Economic and Social Research, is studying the intersection of genetic risks with environmental factors, such as the [work environment](#), that may affect whether or not someone develops Alzheimer's disease. He and his colleagues use large social-science datasets that follow aging Americans over time, such as the national Health and Retirement Survey. Many of these studies in recent years have collected genetic information, too.

"An important focus of our work is on the 'use it or lose it' hypothesis," said Galama. "We know what kind of work these individuals are in, and we can tell whether these are cognitively, physically, or socially demanding, to see whether certain jobs protect them from cognitive decline. We then want to see if, for example, cognitively demanding jobs can delay the onset of Alzheimer's for genetically-at-risk individuals."

Gatz has found indications that the type of job matters for whether a patient develops Alzheimer's disease. Positions that involve managing, mentoring or organizing seem to be protective.

Keeping Alzheimer's at bay

On the preventive side, scientists believe that there are potential opportunities in drug therapies that are already on the market for treating other ailments.

Recently, Nation found that people receiving treatment for diabetes have a lower risk for Alzheimer's than those who have diabetes but aren't on any prescription drugs to manage it.

Nation has been exploring how signs of Alzheimer's may first appear in the brain's vast system of capillaries, which are essential to the brain's protective blood-brain barrier, the "pathway" that determines which nutrients and other items may pass through.

Lately, Nation said, he has been delving into "senolytics"—the use of drugs to help clear the body of aging cells that may be toxic.

Regardless of how his tactics compare to those of other researchers, they are on the hunt for the same trophy—more lives saved.

"Treating earlier and treating all of these pathologies may not be realistic, but if we can come up with ways to boost [brain function](#), then that will benefit the brain in the face of many other diseases," Nation said.

More information: Watch experts from USC Dornsife and USC Davis School discuss early detection, prevention and care for Alzheimer's disease patients:

www.facebook.com/usc/videos/433985157445582/

Provided by University of Southern California

Citation: Scientists shift goals in Alzheimer's research to focus on prevention (2019, July 16)
retrieved 7 May 2024 from

<https://medicalxpress.com/news/2019-07-scientists-shift-goals-alzheimer-focus.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.