

New risk gene illuminates Alzheimer's disease

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A team of international scientists, including a researcher from Simon Fraser University, has isolated a gene thought to play a causal role in the development of Alzheimer's disease. The *Proceedings of the National Academy of Sciences* recently published the team's study.

The newly identified gene affects accumulation of amyloid-beta, a protein believed to be one of the main causes of the damage that underpins this [brain disease](#) in humans.

The gene encodes a protein that is important for intracellular transportation. Each brain cell relies on an internal highway system that transports molecular signals needed for the development, communication, and survival of the cell.

This system's impairment can disrupt amyloid-beta processing, causing its eventual accumulation. This contributes to the development of [amyloid plaques](#), which are a key hallmark of Alzheimer's disease.

Teasing out contributing disease factors, whether genetic or environmental, has long posed a challenge for Alzheimer's researchers.

"Alzheimer's is a multifactorial disease where a build-up of subtle problems develop in the nervous system over a span of decades," says Michael Silverman, an SFU biology associate professor. He worked on the study with a team of Japanese scientists led by Dr. Takashi Morihara at Osaka University.

Identifying these subtle, yet perhaps critical genetic contributions is challenging. "Alzheimer's, like many human disorders, has a genetic component, yet many environmental and lifestyle factors contribute to the disease as well," says Silverman. "In a sense, it is like looking for a needle in a complex genetic haystack."

Only a small fraction of cases have a strong hereditary component, for example early-onset Alzheimer's.

This breakthrough in Alzheimer's research could open new avenues for the design of therapeutics and pave the way for early detection by helping healthcare professionals identify those who are predisposed to the disease.

"One possibility is that a genetic test for a particular variant of this newly discovered gene, along with other variants of genes that contribute to Alzheimer's, will help to give a person their overall risk for the disease.

"Lifestyle changes, such as improved diet, exercise, and an increase in cognitive stimulation may then help to slow the progression of Alzheimer's," says Silverman.

More information: *PNAS* [DOI: 10.1073/pnas.1307345111](https://doi.org/10.1073/pnas.1307345111)

Provided by Simon Fraser University

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