

Study identifies therapeutic targets for Alzheimer's disease

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UK researchers Erhard Bieberich and Simone Crivelli have identified new therapeutic targets for Alzheimer's disease. Credit: Arden Barnes | UK Photo

A new University of Kentucky College of Medicine study has identified potential targets to develop a therapy that could prevent Alzheimer's disease.

Alzheimer's disease is the most common form of dementia, affecting an estimated 6.2 million Americans in 2021 according to the Centers for Disease Control and Prevention. Currently, there is no cure, only pharmaceutical and behavioral interventions for managing symptoms.

The study, published in the *Journal of Extracellular Vesicles* on June 1, focuses on how ceramide, a type of lipid or fat, is used by cells to secrete small fluid-filled sacs called extracellular vesicles. Secreted by cells to communicate with each other, extracellular vesicles have been defined as the "Trojan horses of neurodegeneration."

During the Alzheimer's disease process, extracellular vesicles are enriched with ceramide. If the extracellular vesicles are taken up by [nerve cells](#), the ceramide attacks mitochondria, the cells' powerhouse, thereby compromising [energy production](#) and normal cell function.

The research led by Simone Crivelli, Ph.D., in the Department of Physiology identifies new targets to reduce ceramide binding to extracellular vesicles.

"Increasing our knowledge on how extracellular vesicles are formed and how their cargo is determined may lead to the development of new therapeutic approach for Alzheimer's disease," said Crivelli, a postdoctoral scholar in the lab of Erhard Bieberich, Ph.D.

The current study is part of a broader research effort by the Bieberich lab to understand how extracellular vesicles damage neurons in Alzheimer's disease, ultimately leading to neurodegeneration and [cognitive decline](#). The findings could be promising for the development of new therapies for Alzheimer's disease.

Bieberich's lab is focused on understanding the function of ceramide and was first to discover that ceramide is enriched in [extracellular vesicles](#) in

Alzheimer's disease. Current and future research from his lab is focused on understanding how ceramide mediates or enhances the damage by neurotoxic proteins in Alzheimer's disease.

More information: Simone M. Crivelli et al, Function of ceramide transfer protein for biogenesis and sphingolipid composition of extracellular vesicles, *Journal of Extracellular Vesicles* (2022). [DOI: 10.1002/jev2.12233](https://doi.org/10.1002/jev2.12233)

Provided by University of Kentucky

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