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Common epilepsy drug could prevent and treat Alzheimer's disease

The team led by UBC Psychiatry Prof. Weihong Song, who is also the Jack Brown and Family Professor and Chair in Alzheimer's Disease at UBC, found that if Valproic Acid (VPA) is used as a treatment in early stages of AD memory deficit is reversed.

The study, published in the *Journal of Experimental Medicine*, reveals that VPA works by inhibiting the activity of an enzyme that produces a neurotoxic protein called beta Amyloid. In doing so, plaque formation is discontinued. Amyloid beta-proteins are the central component of neurotoxic plaques in AD.

"We found that if we used VPA in the early stage of Alzheimer's disease, in model mice, it reduced plaque formation and further prevented brain cell death and axon damage," says Song, who is a Canada Research Chair in Alzheimer's disease and Director of the Townsend Family Laboratories in UBC's Faculty of Medicine. "The drug also improved performance in memory tests."

The results will help inform the design of human clinical trials because researchers now understand the mechanisms and pathology of VPA in AD animal models.

"We are very excited about these results because we now know when VPA should be administered to be most effective and we now know how VPA is working to prevent AD," says Song, who is also a member of the Brain Research Centre at UBC and VCHRI. "A small human clinical trial is currently underway and we expect results to be available in the next year."

AD is a neurodegenerative disorder characterized by progressive cognitive deterioration and is the most common form of dementia. The Alzheimer Society of Canada estimates that AD affects close to 300,000 Canadians and accounts for two-thirds of all cases of dementia. By 2031, about 750,000 Canadians will suffer from AD and related dementias.



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Approximately \$5.5 billion per year is spent caring for persons with AD and related dementias in Canada. The Alzheimer's Association in the U.S. estimates there are approximately 500,000 Americans younger than 65 with Alzheimer's or other dementia.

Major funding for this research has been provided by the Canadian Institutes of Health Research, the Canadian Government agency for health research. CIHR's mission is to create new scientific knowledge and to catalyze its translation into improved health, more effective health services and products, and a strengthened Canadian health care system. Composed of 13 Institutes, CIHR provides leadership and support to more than 10,000 health researchers and trainees across Canada.

Additional funding has been provided by: the Michael Smith Foundation for Health Research, British Columbia's provincially mandated health research organization and through a donation from the Townsend Family as well as from a private donation from the Jack Brown and Family Alzheimer Foundation.

The UBC Faculty of Medicine provides innovative programs in the health and life sciences, teaching students at the undergraduate, graduate and postgraduate levels, and generates more than \$200 million in research funding each year.

The Brain Research Centre comprises more than 200 investigators with multidisciplinary expertise in neuroscience research ranging from the test tube, to the bedside, to industrial spin-offs. The centre is a partnership of UBC and VCHRI.

VCHRI is the research body of Vancouver Coastal Health Authority. In academic partnership with UBC, the institute advances health research and innovation across B.C., Canada, and beyond. www.vchri.ca
