

Improving blood vessel health in the brain may help combat Alzheimer's

December 3 2019



PET scan of a human brain with Alzheimer's disease. Credit: public domain

In patients with Alzheimer's disease, amyloid-beta protein fragments accumulate in the tissue and blood vessels of the brain, likely due to a faulty clearance mechanism. In experiments conducted in mice,

investigators at Massachusetts General Hospital (MGH) have found that very slow spontaneous vessel pulsations—also known as 'vasomotion' - drive the clearance of substances from the brain, indicating that targeting and improving this process may help to prevent or treat amyloid-beta accumulation.

In their study published in *Neuron*, the researchers injected a fluorescently labeled carbohydrate called dextran into the brains of awake mice, and they conducted imaging tests to follow its clearance. Their experiments revealed that vasomotion was critical for clearing dextran from the brain and stimulating an increase of the amplitude of these vessel pulsations could increase clearance. Also, in mice with [cerebral amyloid angiopathy](#), a condition that causes amyloid-beta to build up in the walls of the brain's [blood vessels](#), vessel pulsations were hindered and clearance rates were reduced.

"We were able to show for the first time that large dilations and contractions of vessels that happen spontaneously at an ultra-low frequency are a major driving force to clear waste products from the brain," said lead author Susanne van Veluw, Ph.D., an investigator in the department of Neurology at MGH. "Our findings highlight the importance of the vasculature in the pathophysiology of Alzheimer's disease. If we direct [therapeutic strategies](#) towards promoting healthy vasculature and therefore improve clearance of amyloid-beta from the [brain](#), we may be able to prevent or delay the onset of Alzheimer's disease in the future."

More information: *Neuron* (2019). [DOI: 10.1016/j.neuron.2019.10.033](https://doi.org/10.1016/j.neuron.2019.10.033)

Provided by Massachusetts General Hospital

Citation: Improving blood vessel health in the brain may help combat Alzheimer's (2019, December 3) retrieved 20 March 2024 from <https://medicalxpress.com/news/2019-12-blood-vessel-health-brain-combat.html>

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