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# Your Liver May Be 'Eating' Your Brain

By Christopher Wanjek, Columnist | October 15, 2013 02:52pm ET

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A protein called PPARalpha is needed by both the liver and the brain, a new study suggests.

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Your liver could be "eating" your brain, new research suggests.

People with extra abdominal fat are three times more likely than lean individuals to develop [memory loss and dementia](#) later in life, and now scientists say they may know why.

It seems that the liver and the hippocampus (the memory center in the brain), share a craving for a certain protein called PPARalpha. The liver uses PPARalpha to [burn belly fat](#); the hippocampus uses PPARalpha to process memory.



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In people with a large amount of belly fat, the liver needs to work overtime to metabolize the fat, and uses up all the PPARalpha — first depleting local stores and then raiding the rest of the body, including the brain, according to the new study. [[10 Things You Didn't Know About the Brain](#)]

The process essentially starves the hippocampus of PPARalpha, thus hindering memory and learning, researchers at Rush University Medical Center in Chicago wrote in the study, published in the current edition of the journal *Cell Reports*.

Other news reports were incorrect in stating that the researchers established that obese individuals were 3.6 times more likely than lean individuals to develop dementia. That finding dates back to a 2008 study by researchers at the Kaiser Permanente Division of Research in Oakland, Calif.

In another study, described in a 2010 article in the *Annals of Neurology*, researchers at Boston University School of Medicine found that the greater the amount of belly fat, the greater the [brain shrinkage in old age](#).

The surprising discovery in the new study is that the hippocampus uses PPARalpha to process memory and learning, and that this is a possible reason for the connection between belly fat and dementia and/or memory loss.

Rush University researchers, led by neurological sciences professor Kalipada Pahan, raised mice that were deficient in PPARalpha. Some mice had normal PPARalpha in the liver but depleted PPARalpha in the brain, and had poor memory and learning abilities. Others had normal PPARalpha in the brain but not the liver, and showed normal memory, as expected.

When the researchers injected PPARalpha into the hippocampus of PPARalpha-deficient mice, their learning and memory improved, Pahan said.

"Further research must be conducted to see how we could potentially maintain normal PPARalpha in the [human] brain in order to be resistant to memory loss," Pahan told LiveScience.

PPARalpha thus provides a new avenue to explore in searching for a treatment or cure for [Alzheimer's disease](#), dementia, and related memory-loss and cognition problems, Pahan said.

Losing your belly fat won't hurt, either.

Follow Christopher Wanjek [@wanjek](#) for daily tweets on health and science with a humorous edge. Wanjek is the author of "Food at Work" and "Bad Medicine." His column, [Bad Medicine](#), appears regularly on LiveScience.

## Editor's Recommendations

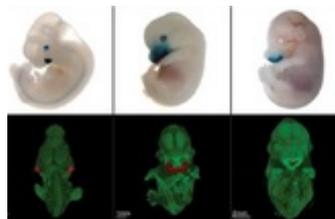
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