

Why you remember names and ski slopes

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When you meet your boss's husband, Harvey, at the office holiday party, then bump into him an hour later over the onion dip, will you remember his name? Yes, thanks to a nifty protein in your brain called kalirin-7.

Researchers at Northwestern University's Feinberg School of Medicine have discovered the brain protein kalirin is critical for helping you learn and remember what you learned.

Previous studies by other researchers found that kalirin levels are reduced in brains of people with diseases like Alzheimer's and schizophrenia. Thus, the discovery of kalirin's role in learning offers new insight into the pathophysiology of these disorders.

"Identifying the key role of this protein in learning and memory makes it a new target for future drug therapy to treat or delay the progression of these diseases," said Peter Penzes, lead author of the study and assistant professor of physiology at the Feinberg School. Penzes studied the brains of laboratory rats which are similar to human brains.

The study will be published November 21 in the journal *Neuron*.

Kalirin behaves like a personal trainer for your memory. When you learn something new, kalirin bulks up the synaptic spines in your brain -- which resemble tiny, white mushrooms. The spines grow bigger and stronger the more you repeat the lesson. It works the same whether you're learning a new cell phone number, skiing a new double black diamond slope or testing a pumpkin cheesecake recipe.

Synaptic spines are the sites in the brain where neurons (brain cells) talk to each other. "If these sites are bigger, the communication is better," Penzes said. "A synapse is like a volume dial between two cells. If you turn up the volume, communication is better. Kalirin makes the synaptic spines grow."

Kalirin's role in learning and memory help explain why continued intellectual activity and learning delays cognitive decline as people grow older. "It's important to keep learning so your synapses stay healthy," Penzes said.

Source: Northwestern University

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