

New understanding of protein's role in brain

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How do we process thoughts and store memories? A team of researchers headed by Dr. Nahum Sonenberg of McGill's Department of Biochemistry and Goodman Cancer Centre has discovered that brains in mammals modify a particular protein in a unique way, which alters the protein's normal function. This discovery represents an important step in understanding how our brains work.

When our memories are being formed, nerve cells, or neurons, communicate with each other through electrical impulses at specialized connections. To strengthen these connections, the neurons require new proteins - key molecules needed for all forms of [cellular activity](#). The protein in question, 4E-BP2, controls the process of producing new proteins in the [nervous system](#).

This process, known as protein synthesis or translation, is the major focus of research in Sonenberg's laboratory. Before the team's discovery, no one knew 4E-BP2 could be chemically altered in such a manner as the team described in its work, much less that this could have an effect on neuron function.

According to the lead researcher Dr. Michael Bidinosti, a recent graduate from Sonenberg's laboratory, "we found a modification to a protein that controls the cellular protein-synthesis machinery. This modification seems to affect the ability of [nerve cells](#) to communicate with each other and is thought to be part of the processes underlying memory."

He explains that study of [protein synthesis](#) and of memory are increasingly converging fields, and that the team's research is an important achievement in this arena. Collaboration was critical to the discovery as the team includes researchers from the Université de Montréal, the Montreal Neurological Institute, the University of Toronto, Baylor College of Medicine in Houston, and the University of Bergen in Norway.

"Better understanding of [protein](#) synthesis in the [brain](#) is crucial to the advancement of neuroscience, particularly as researchers discover that altered proteins may have a direct impact on the memory process," says Dr. Anthony Phillips, Scientific Director of the Canadian Institutes of Health Research (CIHR) Institute of Neurosciences, Mental Health and Addiction. "CIHR hopes that these new findings will lead to more research aimed at ultimately solving memory loss issues."

More information: The research was published in the journal *Molecular Cell* on March 25, 2010.

Provided by McGill University

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