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T cell protein boosts learning

Stress, sickness and depression can generate inflammation in the brain, which is detrimental to learning. According to a new study that will appear online on May 3rd in the *Journal of Experimental Medicine* (www.jem.org), T cells level the learning curve by producing a protein that combats inflammation, establishing a more learning-conducive environment in the brain.

Learning defects had been reported in mice lacking T cells, but how these cells boosted brain power was unknown. A team led by Jonathan Kipnis (University of Virginia, Charlottesville) investigated the activity of these cells in mice trained to find their way through a water maze. Training the mice caused T cells to accumulate in the membrane that surrounds the brain. Once there, the cells produced a protein called interleukin-4 (IL-4), which reduced the abundance of inflammatory proteins known to hinder learning. Mice lacking IL-4 had a hard time navigating the maze, but their learning disability could be reversed by giving them IL-4-producing T cells.

It's not yet clear if IL-4 has similar effects in humans. If so, these findings could impact the design of new therapies aimed at boosting learning and memory in children with learning disabilities or adults with age-related dementia.

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