

## Study shows why exercise boosts brainpower

POSTED: 7:46 p.m. EDT, March 12, 2007

### STORY HIGHLIGHTS

- Exercise builds new brain cells in a region linked with memory and memory loss
- Mice grew new cells in area known to be affected in age-related memory decline
- MRIs showed similar cell growth in human brains after exercise

**WASHINGTON** (Reuters) -- Exercise boosts brainpower by building new brain cells in a brain region linked with memory and memory loss, U.S. researchers reported Monday.

Tests on mice showed they grew new brain cells in a brain region called the dentate gyrus, a part of the hippocampus that is known to be affected in the age-related memory decline that begins around age 30 for most humans.

The researchers used magnetic resonance imaging scans to help document the process in mice -- and then used MRIs to look at the brains of people before and after exercise.

They found the same patterns, which suggests that people also grow new brain cells when they exercise.

"No previous research has systematically examined the different regions of the hippocampus and identified which region is most affected by exercise," Dr. Scott Small, a neurologist at Columbia University Medical Center in New York who led the study, said in a statement.

Writing in the Proceedings of the National Academy of Sciences, the researchers said they first tested mice.

Brain expert Fred Gage, of the Salk Institute in La Jolla, California, had shown that exercise can cause the development of new brain cells in the mouse equivalent of the dentate gyrus.

The teams worked together to find a way to measure this using MRI, by tracking cerebral blood volume.

"Once these findings were established in mice, we were interested in determining how exercise affects the hippocampal cerebral blood volume maps of humans," they wrote.

They of course could not dissect the brains of people to see if new neurons grew, but they could use MRI to have a peek.

They recruited 11 healthy adults and made them undergo a three-month aerobic exercise regimen.

They did MRIs of their brains before and after. They also measured the fitness of each volunteer by measuring oxygen volume before and after the training program.

Exercise generated blood flow to the dentate gyrus of the people, and the more fit a person got, the more blood flow the MRI detected, the researchers found.

"The remarkable similarities between the exercise-induced cerebral blood volume changes in the hippocampal formation of mice and humans suggest that the effect is mediated by similar mechanisms," they wrote.

"Our next step is to identify the exercise regimen that is most beneficial to improve cognition and reduce normal memory loss, so that physicians may be able to prescribe specific types of exercise to improve memory," Small said.