Rats Do Resistance Training To Make Your Brain Healthier

By ACSH Staff — February 20, 2016

Three blind mice. See how they run. Or lift weights. Or perform high-intensity interval training. Sounds like fun, right? That’s what researchers out of the University of Jyvaskyla in Finland certainly thought. So, they decided to investigate.

In a recent study published in the February issue of the *Journal of Physiology*, scientists subjected rodents (rats, not mice) to different exercise modalities and assessed what effect if any the exercises had on brain structure and function. And they found that a good aerobic workout improves gray matter.

Here’s what happened: Researchers injected the rodents with a substance used to detect new brain cells and separated them into four groups:

1) an aerobic exercise group
2) a resistance training group
3) a high-intensity interval training, or HIIT, group
4) a sedentary control

Each group performed its assigned activity (or non-activity) for six-to-eight weeks.

We know what you’re thinking — How does one control and promote exercise among rats?

Well, for the first group, the rats were given a running wheel, which allowed them to run in their cages at their leisure. While individual time and distances varied, most rats utilized the wheel, logging up to several miles per day.
Resistance-training rats climbed a tiny ladder with weights attached to their tails. And the rat-equivalent of HIIT training was surprisingly similar to what humans would perform: Fifteen minutes of three-minute, all-out running bursts on a treadmill followed by two minutes of slow and steady active recovery.

At the conclusion of the six-to-eight-week period, scientists found a marked increase in what's called neurogenesis [3] the creation of new brain cells in a mature brain in certain exercise groups. Specifically, neurogenesis occurred in the hippocampus, the part of the brain responsible for learning and memory [4].

The cohort experiencing the greatest amount of neurogenesis: The aerobic exercise group.

The HIIT group also showed an increase in neural development, but significantly less than the aerobic-training group. Interestingly, resistance training showed no effect on hippocampal structure and function, suggesting that even rats can be "muscleheads [5]."

According to the study's lead researcher, Dr. Miriam Nokia, the findings have important health implications.

"Sustained aerobic exercise might be most beneficial for brain health also in humans," Dr. Nokia told the New York Times [6]. Animal studies are usually the precursor to human studies, so potential next steps could be to determine whether or not these same findings hold true across human cohorts.

If you're looking not only to improve your heart health or physique, and maybe enhancing your intellect, sustained aerobic exercise might prove useful. That's not to say that HIIT training and resistance exercises aren't beneficial; they may simply lead to other cognitive benefits.