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Can Exercise Really Make You Grow New Brain Cells?

How one neuroscientist discovered the path to a healthier and happier brain.

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JANE PORTER |

Wendy Suzuki, was on a river raft

Peru, when she had a major wakeup call. She found that she was the weakest person on the expedition, an observation that bothered her, given that she was only in her mid-30s at the time. But Suzuki also wasn't all that surprised. A professor of neural science and psychology at New York University, she had been spending all her time in the research lab. "I was in New York, in my lab, eating takeout, and gaining weight," says Suzuki.

When she got back from Peru, she decided to change her lifestyle. Suzuki started going to the gym regularly and after a few months, she noticed changes that, as a neuroscientist,

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Wendy Suzuki Photo:
courtesy of Wendy
Suzuki

piqued her interest. For one, her mood shifted and she felt generally happier. Then one day, while working on a research grant, she surprised herself. "I was sitting in my office and I noticed something I hadn't noticed before: My writing was going

well. Typically, writing never goes well," she says. "I'm a neuroscientist. My memory is better; my attention is better; my mood is better." At the time, she asked herself: "What do we know about this?"

It was the beginning of what turned into a shift in Suzuki's research. She refocused her lab work on the effects exercise has on patterns of electrical activity in the brain and neuroplasticity. In her new book, [Healthy Brain, Happy Life](#), Suzuki tells her personal story while sharing insights gleaned from her years of research in the field.

Fast Company spoke with Suzuki about the unique connection between brain cell growth and exercise as well as how to create a practical and sustainable exercise regimen that maximizes one's brain health and happiness.

WHY THE TIME TO START IS NOW

Because our memory degenerates with age,

much of the research on exercise's effects on memory focuses on older populations, says Suzuki. But preventing that degeneration before it starts is an area of study Suzuki realized could use more exploration. She began teaching an undergraduate class at NYU called "Can Exercise Change Your Brain?" which involved a one-hour intense workout—led by Suzuki herself—followed by a lecture focused on what exercise does to the brain.

Her students that semester were her first study subjects. She tested them cognitively at the start and end of the semester and found that even with just a once-a-week exercise regimen, their response time overall improved. Compared to a control class that was not exercising regularly, she also found that her students were more capable of dealing with the stress of final exams. "Exercise can protect you from the debilitating effects of stress," she says. What's more, she believes the most dramatic changes in the brain due to exercise happen to young adults, which is why she urges that the time to start exercising is now.

HOW TO BUILD NEW BRAIN CELLS

One reason exercise leads to a happier, healthier brain is because it promotes neurogenesis, or the birth of new brain cells, which helps



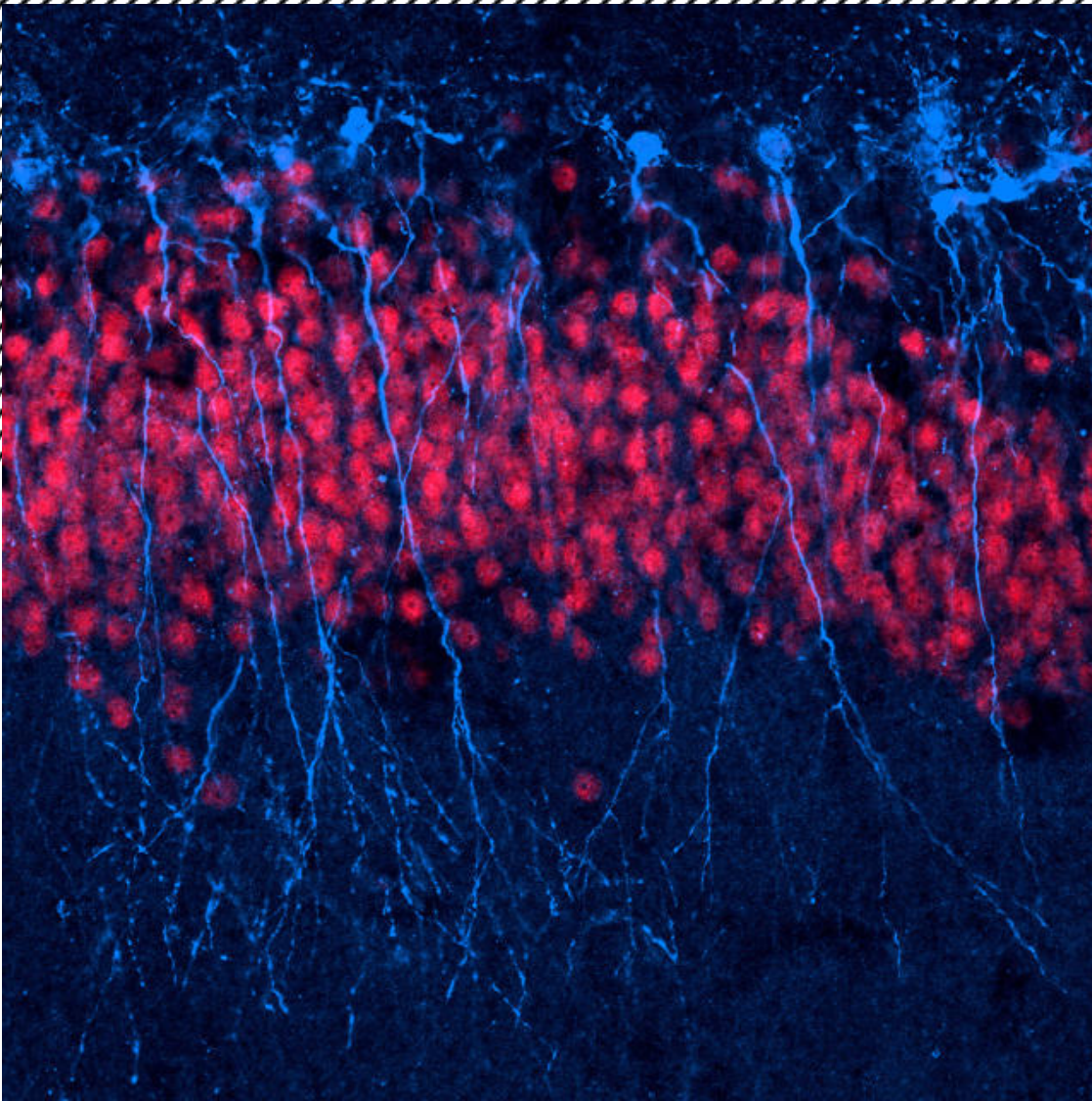


Photo: Flickr user [Jason Snyder](#)

improve cognitive function, says Suzuki. Importantly, there's one very specific region of the brain where actual new brain cells are created because of exercise: the hippocampus. A small seahorse-shaped region on either side of the brain, the hippocampus is critical for our ability to form and retain new long-term memories.

With only two areas of the brain capable of producing new brain cells in adulthood—the olfactory bulb, associated with our ability to smell, and the hippocampus, which is critical

not just for memory, but also mood and imagination, says Suzuki, it's important to understand just what's going on neurologically when we exercise.

The hippocampal cells produced as a result of exercise aren't the same as the ones we already have, she says. "They are different from the old hippocampal cells that are there," says Suzuki. Because they are newer and stronger, "they get integrated into more hippocampal circuits faster." Hence the improvement in memory and mood.

PUMPING UP OUR BRAIN CIRCUITS

Much of the research in exercise and its effects on the brain has focused on the prefrontal cortex, the area of the brain involved in shifting attention, personality, and executive functions like decision making. While exercise doesn't produce new brain cells in the prefrontal cortex, it does promote gliogenesis, or the production of support cells that connect neural cells in the prefrontal cortex, allowing them to work more efficiently.



Exercising first thing in the morning

During exercise, there's a hormone secreted by the muscles called [irisin](#), which stimulates the presence of BDNF, or brain-derived neurotrophic factor,

can produce a noticeable difference in your attention and ability to focus.

important for the efficient transmission of signals in the brain. "BDNF, like the oil in a car, will grease the wheels and make the brain work better," says Suzuki.

WHY FIRST THING IN THE MORNING MATTERS

We know exercising is important, but the question of what time of day is best is a matter of speculation. According to Suzuki, if you want to get the maximum effect from exercising, do it first thing in the morning. "When do you want those growth factors in your brain working? You want them working when you get to work," she says.

Exercising first thing in the morning can produce a noticeable difference in your attention and ability to focus. When Suzuki changed her workout routine from evenings to early mornings, she noticed the effects in herself as well. "I was able to get much longer bouts of effective writing done on mornings when I worked out," she says. "I pooped out much earlier on mornings I didn't exercise."

YOU'LL BE EXHAUSTED AT FIRST—PUSH THROUGH IT

That's not to say getting out of bed and lacing up

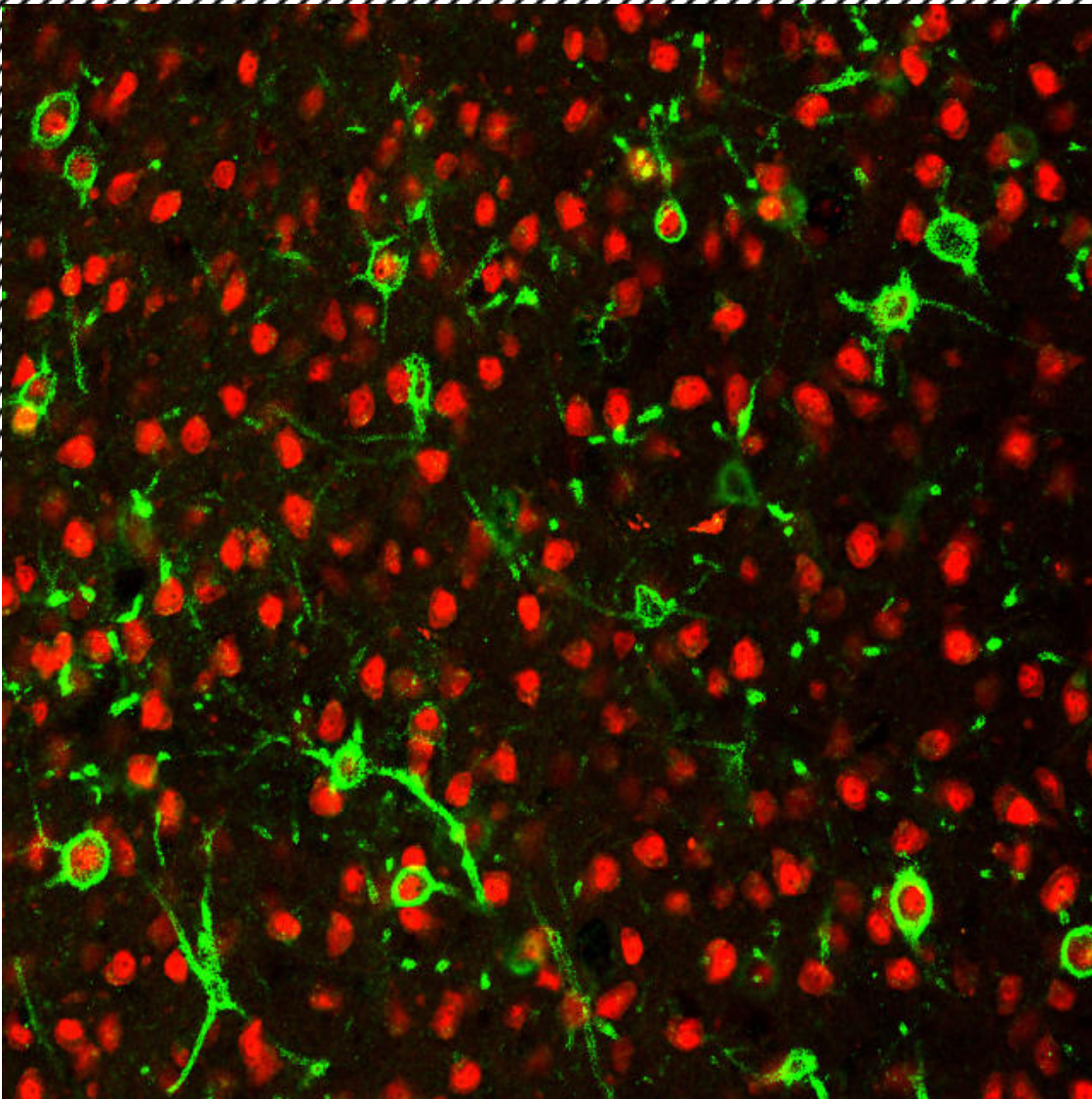


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your sneakers early in the morning is easy. In fact, Suzuki warns that when you get started, you'll have to push through a hump during which your body may feel more exhausted than usual for the first two weeks. At first it will be tough, she acknowledges. "Just like anything else, it's painful." But she encourages people to push through that initial discomfort, remembering that it takes the brain and body time to adjust to a new regimen. "It's hard at first, but it's for your brain strength," she says. "I hope people can use that to get inspired to do a little more."

And remember too that you may not see positive results in the first, second, or even third week. It takes time for change to happen. "It's not like one day I went to the gym and everything changed," says Suzuki. " It took a year and a half to build everything up."

Today Suzuki is increasing her research on a larger scale, studying a group of incoming freshman at NYU who have agreed to alternate between not exercising one semester and working out regularly the next. "I am so excited about this research because of its potential to change the way that we live," says Suzuki. "Everyone is in search of the magic pill that does not exist. I consider exercise our best bet for the magic pill."

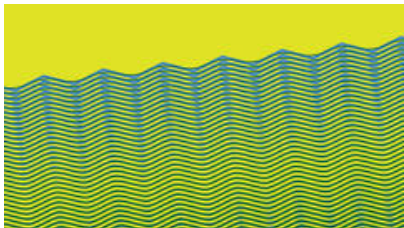




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