

Exercise boosts health by influencing stem cells to become bone, not fat, researchers find

September 1 2011

McMaster researchers have found one more reason to exercise: working out triggers influential stem cells to become bone instead of fat, improving overall health by boosting the body's capacity to make blood.

The body's mesenchymal stem cells are most likely to become fat or bone, depending on which path they follow.

Using treadmill-conditioned mice, a team led by the Department of Kinesiology's Gianni Parise has shown that [aerobic exercise](#) triggers those cells to become bone more often than fat.

The exercising mice ran less than an hour, three times a week, enough time to have a significant impact on their blood production, says Parise, an associate professor.

In sedentary mice, the same stem cells were more likely to become fat, impairing blood production in the marrow cavities of bones.

The research appears in a new paper published by the *Journal of the Federation of American Societies for Experimental Biology*.

"The interesting thing was that a modest exercise program was able to significantly increase [blood cells](#) in the marrow and in circulation," says Parise. "What we're suggesting is that exercise is a potent stimulus -- enough of a stimulus to actually trigger a switch in these [mesenchymal stem cells](#)."

The composition of cells in the bone marrow cavity has an important influence on the productivity of blood stem cells.

In ideal conditions, blood stem cells create healthy blood that boosts the immune system, permits the efficient uptake of oxygen, and improves the ability to clot wounds.

[Bone cells](#) improve the climate for blood stem cells to make blood.

But when [fat cells](#) start to fill the bone marrow cavity -- a common symptom of [sedentary behavior](#) -- blood stem cells become less productive, and conditions such as anemia can result.

The findings add to the growing list of established benefits of exercise, Parise says, and suggest that novel non-medicinal treatments for blood-related disorders may be in the future.

"Some of the impact of exercise is comparable to what we see with pharmaceutical intervention," he says. "Exercise has the ability to impact stem cell biology. It has the ability to influence how they differentiate."

Provided by McMaster University

Citation: Exercise boosts health by influencing stem cells to become bone, not fat, researchers find (2011, September 1) retrieved 23 April 2024 from <https://phys.org/news/2011-09-boosts-health-stem-cells-bone.html>

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