

# A vascular fountain of youth

April 12 2019, by Jennifer Rainey Marquez

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Credit: Reid Schulz

Heart disease is the leading cause of death in the United States among men and women, and the number one risk factor is age. In large part, this is because of the damage that occurs in our blood vessels as we grow older. But what if you could turn back your circulatory system's clock?

Georgia State scientists recently uncovered a molecule that could serve

as a vascular fountain of youth. The molecule, which is produced by the liver during fasting or [calorie restriction](#), can delay vascular aging by preventing senescence—the gradual deterioration of a cell's ability to divide and multiply—among endothelial cells, which line the interior surface of [blood vessels](#).

The molecule, called  $\beta$ -Hydroxybutyrate, not only promotes cell division. It can also help fight against senescence caused by accumulated DNA damage, the primary cause of aging.

"When people grow old, the vessels that supply different organs are the most sensitive to age-related damage," says the study's senior author, Ming-Hui Zou, director of the Center for Molecular and Translational Medicine at Georgia State and a Georgia Research Alliance Eminent Scholar in Molecular Medicine. "If we can make the vascular system 'younger,' it could reduce the risk of not just cardiovascular disease but also Alzheimer's disease and cancer."

Unfortunately, it takes more than just skipping a meal to produce the molecule naturally. The liver only makes  $\beta$ -Hydroxybutyrate during periods of extremely restrictive food intake, starvation or prolonged intense exercise. So the researchers are working to develop a chemical that can mimic its effects.

"It's been known that fasting can have an anti-aging effect, but our work has provided a chemical link," says Zou. "The next step is figuring out how to turn this discovery into a tool that can be used by anyone, not just dieters."

Provided by Georgia State University

Citation: A vascular fountain of youth (2019, April 12) retrieved 5 May 2024 from

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