

# Garlic boosts hydrogen sulfide to relax arteries

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Eating garlic is one of the best ways to lower high blood pressure and protect yourself from cardiovascular disease. A new study from the University of Alabama at Birmingham (UAB) shows this protective effect is closely linked to how much hydrogen sulfide (H<sub>2</sub>S) is produced from garlic compounds interacting with red blood cells.

The UAB researchers found this interaction triggered red blood cells to release H<sub>2</sub>S, which then led to the relaxation of blood vessels. Fresh garlic was used at a concentration equal to eating two cloves. The resulting H<sub>2</sub>S production caused up to 72 percent vessel relaxation in rat arteries.

This relaxation is a first step in lowering blood pressure and gaining the heart-protective effects of garlic, said David Kraus, Ph.D., a UAB associate professor in the Departments of Environmental Health Sciences and Biology and the study's lead author.

The research team examined molecules in garlic called polysulfides and their ability to liberate H<sub>2</sub>S within cells. The findings appear in the journal *Proceedings of the National Academy of Sciences* (PNAS).

"When these garlic compounds are metabolized to H<sub>2</sub>S in the vascular system, the H<sub>2</sub>S targets membrane channels and causes smooth muscle cells to relax," Kraus said. "So a garlic-rich diet has many good effects, and H<sub>2</sub>S may be the common mediator."

The findings add to a study by John Elrod and David Lefer, Ph.D., of the Albert Einstein College of Medicine published in PNAS that showed H<sub>2</sub>S protected hearts from the tissue and cell damage often seen in heart attack patients.

The new study, performed by Gloria Benavides, Ph.D., of UAB's Department of Environmental Health Sciences, Kraus and others, is the first to

show garlic-derived polysulfides in the diet boost bodily H<sub>2</sub>S production.

H<sub>2</sub>S is a toxic, flammable gas responsible for the smell of rotten eggs. It's also produced naturally by the body in small amounts, and as age advances, H<sub>2</sub>S production dwindles.

Exactly how H<sub>2</sub>S affords the cardiovascular system so much protection is not entirely clear, but it may involve limiting oxidative damage in cells, Kraus said.

"The role of garlic compounds in preventing platelet aggregation, which can trigger a heart attack or stroke, and in limiting cancer growth and the progression of several diseases is well documented," he said.

The new findings show H<sub>2</sub>S may be the mediator for these protective benefits. Future studies are being planned to better understand how much H<sub>2</sub>S production is needed through garlic or supplements to maximize those benefits.

Source: University of Alabama at Birmingham

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