

Hydrogen sulfide reduces glucose-induced injury in kidney cells

January 3 2012

Hydrogen sulfide, a gas notorious for its rotten-egg smell, may have redeeming qualities after all. It reduces high glucose-induced production of scarring proteins in kidney cells, researchers from The University of Texas Health Science Center San Antonio report in the *Journal of Biological Chemistry*. The paper is scheduled for print publication in early 2012.

"There is interest in gases being mediators of biological events," said B.S. Kasinath, M.D., professor of medicine and a nephrologist with UT Medicine San Antonio, the clinical practice of the School of Medicine at the UT Health Science Center. "We found that when we added sodium hydrosulfide, a substance that releases [hydrogen sulfide](#), to [kidney cells](#) exposed to [high glucose](#), it decreased the manufacture of matrix proteins that scar the kidney."

Consistent with this finding, enzymes in the kidney that facilitate production of hydrogen sulfide were reduced in mice with type 1 or type 2 diabetes, Dr. Kasinath and his team reported.

Scarring in the kidney, called renal fibrosis, is a core defect leading to end-stage kidney disease. Nearly half of end-stage kidney disease in the U.S. is related to diabetes, which is a disease marked by poor regulation of blood glucose.

"We have found a way to decrease matrix [protein synthesis](#), which is a problem in diabetes," Dr. Kasinath said. Because the studies are limited

to cells, the finding should not be extrapolated to the treatment of human [diabetic kidney disease](#), he emphasized.

The finding paves the way for studies in mice or other animal models. Both the safety and effectiveness of hydrogen sulfide should be established in animal models of kidney disease before human trials can be considered. This precaution is required because hydrogen sulfide, at higher concentrations, is known to be a toxic agent.

[Journal of Biological Chemistry](#) editors selected the team's manuscript to be the Paper of the Week, reserved for the top 1 percent of manuscripts in significance and overall importance. About 50 to 100 papers are selected for this recognition from the more than 6,600 the journal publishes each year. Hak Joo Lee, Ph.D., a postdoctoral fellow in the Division of Nephrology, is the lead author on the [study](#).

Provided by University of Texas Health Science Center at San Antonio

Citation: Hydrogen sulfide reduces glucose-induced injury in kidney cells (2012, January 3)
retrieved 6 May 2024 from
<https://medicalxpress.com/news/2012-01-hydrogen-sulfide-glucose-induced-injury-kidney.html>

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