

## Heart attack research discovers new treatment target

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Research led by David Lefer, PhD, Professor and Director of the Cardiovascular Center of Excellence at LSU Health Sciences Center New Orleans School of Medicine, demonstrates for the first time crosstalk between two protective signaling molecules during a heart attack. By providing new and important information about the mechanisms involved in heart attacks and organ transplantation, the research identifies a potential new treatment target for heart disease.

The paper will be published in *Proceedings of the National Academy of Sciences (PNAS)* Online Early Edition the week of February 10, 2014. Previous studies found that <u>hydrogen sulfide</u> protects cells from damage caused by a number of diseases, including cardiovascular, in a similar manner to that reported for another protective gas, nitric oxide. Though hydrogen sulfide and nitric oxide are biologically similar, it was thought that they protected cells via distinctly different mechanisms. The LSUHSC research team found that instead, they interact and "talk" to each other, and it is this interaction that produces the protective effect during heart attacks.

"We found that hydrogen sulfide regulates the body's production of nitric oxide which, in turn, protects the heart muscle against cell death," notes Dr. Lefer.

Working in a mouse model, the researchers discovered the interdependence between the two molecules. When an enzyme that produces hydrogen sulfide was absent, they found that the production



and action of <u>nitric oxide</u> were greatly reduced, resulting in increased oxidative stress and more severe injury to the heart and liver from blocked blood flow as well as from the eventual restoration of blood flow.

"This study has far reaching implications for the development of novel treatments for cardiovascular disease," concludes Dr. Lefer. Although progress has been made, <u>heart disease</u> remains the leading cause of death in the United States. According to the American Heart Association, approximately every 34 seconds, 1 American has a coronary event, and approximately every 1 minute 23 seconds, an American will die of one.

**More information:** Hydrogen sulfide (H2S) cytoprotective signaling is endothelial nitric oxide (eNOS)-nitric oxide (NO)–dependent, <u>www.pnas.org/cgi/doi/10.1073/pnas.1321871111</u>

Provided by Louisiana State University

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