

Veterinary researcher studies potential therapy for hydrogen sulfide poisoning

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Ongoing research at Iowa State University is investigating the long-term neurological damage caused by hydrogen sulfide poisoning, a threat to both humans and animals that can originate from sources as varied as swamps to industrial processes to manure pits.

Wilson Rumbelha, a professor of veterinary diagnostic and production animal medicine, said the poison targets multiple systems in the [human body](#), including the respiratory and cardiovascular systems and the brain. In high enough concentrations, exposure to the gas can be acutely fatal.

But Rumbelha's research is focused on the long-term consequences of hydrogen sulfide poisoning in survivors. He said exposure can bring about psychological and neurological problems in humans, sometimes months after the exposure.

"In some cases, survivors can end up in a permanent vegetative state," Rumbelha said. "We don't have an antidote, and little is known about the mechanisms behind how it works. It's really a novel area that hasn't been investigated very well."

Rumbelha recently received a two-year grant from the National Institutes of Health to study the long-term risks associated with exposure to the gas and to test a drug that may pave the way to a therapy in humans. Rumbelha is working with personnel at the University of California, San Diego, to determine if a novel compound currently being investigated as a treatment for cyanide exposure may also have benefits

in cases of hydrogen sulfide poisoning.

Hydrogen sulfide gas can form naturally in marshes, volcanoes and sewers. It's also a byproduct of some industrial and manufacturing processes, such as oil and gas production. Animals sometimes come into contact with the gas on farms when manure pits are agitated, Rumbeiha said. Production animals occasionally suffer from hydrogen sulfide poisoning if given feed or water high in sulfur. The gas gives off a distinct sulfur odor, but, in high enough concentrations, it can paralyze a human's sense of smell and become virtually undetectable.

The NIH grant funding Rumbeiha's work comes from a program that supports research on potential responses to weapons of mass destruction. Rumbeiha said policymakers have raised concerns about the possibility of terrorists releasing [hydrogen sulfide](#) in enclosed areas such as subway stations.

In addition to its national security implications, Rumbeiha said his research could yield advances in both veterinary medicine and human health.

"The poison has a toxic effect on both animals and people," he said. "By understanding the animal model, that knowledge could also be applicable in humans."

Provided by Iowa State University

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