

Manganese Can Stop E. Coli Toxin, Study Says

By Elizabeth Lopatto - Jan 19, 2012

A [deadly toxin](#) produced by certain kinds of E. coli, including those that caused an outbreak in [Europe](#) last year, can be combated using the element manganese, according to research that may lead to an inexpensive treatment for infections.

Manganese, commonly found in nature, protected cells against as much as 4,000 times the amount of that toxin required to cause death in the lab, according to scientists in the journal [Science](#). In a study, mice dosed with manganese were resistant to the poison.

That toxin, called Shiga, caused the severe diarrhea and kidney damage seen in the European outbreak. Antibiotics aren't effective and may make the poison worse by causing the bacteria to burst open, releasing more Shiga and making patients sicker. There is no treatment for the infections, which sicken 150 million worldwide and kill more than 1 million each year, according to the study authors.

"An inexpensive, accessible treatment -- not a designer drug -- is the ideal solution," said Adam Linstedt, a biologist at [Carnegie Mellon University](#) in Pittsburgh and a study author, in a statement. Most of the illnesses from Shiga take place in the developing world, so cheapness is important, he said.

The toxin is also produced by [Shigella](#), which can be acquired through contaminated food or water. About 14,000 cases of this illness are reported in the U.S. every year.

Manganese protects cells by blocking the path the Shiga toxin takes to shut down the cell. Shiga avoids the cell's lysosomes, which would render it harmless, by riding on a protein called GPP130. The presence of manganese causes GPP130 to go to the lysosomes, leading Shiga there as well.

The 2011 European outbreak sickened more than 4,300 people and killed at least 50.

The culprit was tainted sprouts, although health officials at first mistakenly blamed tomatoes, Spanish cucumbers, and lettuce.