

# Toward a fast, simple test for detecting cholera rampaging in 40 countries

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With cholera on the rampage in Haiti and almost 40 other countries, scientists are reporting the development of a key advance that could provide a fast, simple test to detect the toxin that causes the disease. The report appears in ACS' journal *Bioconjugate Chemistry*. Cholera affects more than 200,000 people annually, mainly in developing countries, and causes about 5,000 deaths. Many involve infants, children, and the elderly.

J. Manuel Perez and colleagues note that cholera is an intestinal infection from food or water contaminated with the bacterium *Vibrio cholerae*. It produces a toxin that can cause severe [diarrhea](#), which can lead to rapid [dehydration](#) and death. Prompt treatment thus is essential, and yet existing tests to diagnose cholera are time-consuming, expensive, and require the use of complex equipment.

The scientists describe a key advance toward a better, faster test. The new method uses specially prepared nanoparticles of [iron oxide](#), each barely 1/50,000th the width of a single human hair, coated with a type of sugar called dextran.

To achieve this, they looked for specific characteristics of the cholera toxin receptor (GM1) found on cells' surface in the victim's gut, and then they introduced these features to their nanoparticles.

When the magnetic nanoparticles are added to water, blood, or other fluids to be tested, the cholera toxin binds to the nanoparticles in a way

that can be easily detected by instruments. The test hardware can be turned into portable gear that health care workers could use in the field, the scientists say. The approach also shows promise for treating cholera intoxication.

**More information:** "Identification of Molecular-Mimicry-Based Ligands for Cholera Diagnostics using Magnetic Relaxation", *Bioconjugate Chemistry*.

Provided by American Chemical Society

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