

Researchers develop quick way to detect rotavirus

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Christine Pitner '11 works in the lab to perfect the test biosensor; the test can detect rotavirus, the most common cause of severe diarrhea among infants and young children.

(PhysOrg.com) -- It may not have the instant recognition of AIDS or malaria, but rotavirus -- a common cause of diarrhea -- kills more than a half million people a year, most of them children in developing countries.

A team of Cornell researchers hopes to help bring those numbers down by developing a portable, rapid and inexpensive test to detect rotavirus, which would allow for the early intervention needed to save lives.

Rotavirus, the most common cause of severe diarrhea among infants and

young children, kills its victims by causing dehydration. Swift rehydration is crucial to treating the disease and preventing [brain damage](#). Yet diagnostic testing is currently done in sophisticated laboratory facilities, which are often inaccessible in the developing nations where rotavirus is most prevalent. Even where there are more readily available treatment options, rotavirus can lead to costly hospital visits -- an average of 200,000 per year in the United States before the availability of a vaccine in 2006.

The new test, developed by Antje Baeumner, professor of biological and environmental engineering, and research associate Katie Edwards, is a highly sensitive antibody-recognition system similar to a home pregnancy test, yielding a visible line when [rotavirus](#) is present in a fecal sample.

This test does not require any separate sample processing steps and can detect low concentrations of virus directly in fecal samples," Edwards said.

One of the biggest challenges has been ensuring that the results are easy to read. Baeumner's team not only had to create a simple test that could be used in non-lab settings but also produce highly visible color cues to code the results. Edwards said she is perfecting the test's visual detection properties and, with Christine Pitner '11 and research support specialist Barbara Leonard, she is also testing its effectiveness among different diets and fecal consistency.



In the presence of rotavirus, a readily visible band appears. It increases in intensity with increasing rotavirus concentration (dilutions are listed in the numbers here).

A partnership with a major company, which has not been revealed, means the test will be ready for commercialization shortly after development, which Edwards hopes will be soon.

The challenge then will be ensuring it is distributed to those who need it most. India, Southeast Asia, sub-Saharan Africa and Latin America are targets because they have the greatest mortality rates.

"I do think that it could have a significant impact, as long as it gets to the right people. The product development experience and distribution resources brought to the table by our corporate partnership will help to transition this research into a much-needed assay for people in developing nations," Edwards said.

Provided by Cornell University

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