

# SAVING LIVES With a Pocket-Size Lab

What if aid workers in developing regions could quickly and accurately diagnose deadly diseases using just a paper card? Treatments could be delivered more effectively. Sources of outbreaks could be identified faster. Lives can be saved.

Dr. Shannon Weigum, assistant professor of biology at Texas State University, is using high-tech methods to create compact, easy-to-use tools that may help save the lives of some of the world's most vulnerable children.

"It's essentially an equipment-free platform to do some pretty sophisticated diagnostics," she said.

Weigum's work focuses on fighting gastrointestinal infections and diarrheal diseases. Ebola and bird flu might make bigger headlines — and fewer snickers — but these basic digestive ailments do far more damage.

In regions where people don't have reliable access to clean food and water, diseases like these kill more than 800,000 children every year.

Imbued with nanoparticles and using microfluidics, her paper cards interact with specific bacteria or viruses to quickly, accurately identify diseases.

A faster diagnosis means health workers can move beyond treating symptoms and attack the disease.

To deliver even faster, more detailed results in the field, Weigum is also collaborating with industry partners at Texas State's STAR Park to use smartphones to expand the card's capabilities.

Beyond fighting disease in developing regions, Weigum sees opportunities to use her tool to enhance food and water safety in American restaurants or on cruise ships. It could even be designed to screen for potential bioterrorism agents in domestic water supplies.

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SPECIALIZED  
**NANOPARTICLES  
AND MICROFLUIDICS**  
INSIDE THIS PAPER CARD  
PROVIDE FAST, ACCURATE  
**FIELD DIAGNOSES**  
FOR A VARIETY OF  
DEADLY PATHOGENS.



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