Officials of the Food and Drug Administration (FDA) in July announced steps “to ensure that certain tests used by health care professionals to help diagnose and treat patients provide accurate, consistent, and reliable results.” As part of this effort, FDA plans to extend oversight to include laboratory-developed tests (LDTs), which are designed, manufactured, and used within a single laboratory—a category of diagnostic procedures that more typically falls under jurisdiction of the Centers for Medicare & Medicaid Services (CMS) under the mandate of the Clinical Laboratory Improvement Amendments (CLIA). A major focus of this new activity from FDA is the ongoing development of “companion diagnostics,” that is, tests that are paired with specific treatments. The agency says it will continue “to exercise enforcement discretion for low-risk LDTs, LDTs for rare diseases and, under certain circumstances, LDTs for which there is no FDA-approved or cleared test.”

2009 to enable responses to priority pandemic prevention and response.

On August 4, the U.S. Ambassador to Liberia declared a disaster due to the effects of the Ebola outbreak. In response, USAID has activated a Disaster Assistance Response Team (DART). The DART, comprising team members in Monrovia, Liberia, and Conakry, Guinea, will coordinate planning, operations, logistics, administrative issues, and other critical areas of the interagency response. CDC will staff public health and medical response positions on the DART. This week, USAID announced an additional $12.45 million of Global Health and International Disaster Assistance funding to support efforts by CDC, the WHO, and NGOs to ramp up the Ebola response. USAID also has an additional 70,000 sets of personal protective equipment already in central and southern Africa that can be deployed to West Africa for use in the Ebola outbreak.

Ken Isaacs, Samaritan’s Purse, Boone, N.C.: Samaritan’s Purse is an international nongovernment organization with 38 years of experience dedicated to humanitarian relief. The Ebola outbreak has had a profound impact on our organization. We had hoped not to become involved in direct clinical care but as the disease resurged in June, we had no choice.

We believe the reported numbers only show 25–50% of the cases. The ministries of Health in Guinea, Liberia, and Sierra Leone do not have the capacity to handle these crises. If a mechanism is not found to create an acceptable paradigm for the international community to become directly involved, then the world will be relegating the containment of this disease to threaten Africa and other countries to three of the poorest nations in the world.

Samaritan’s Purse and [Doctors Without Borders] continue to be the two primary caregivers. . . That the world would allow two relief agencies to shoulder this burden along with overwhelmed Ministries of Health in these countries testifies to the lack of serious attention the epidemic was given.

The global impact of Ebola has yet to be fully realized. In the developing world, it has the potential to destabilize entire countries while creating widespread and even regional insecurity. It will have a devastating effect on transportation hubs, economies, health care systems, and governments.

Jeffrey L. Fox is the Microbe Current Topics and Features Editor.

NEW IN ASM JOURNALS

E. coli More Adept at Resisting Radiation Than Was Thought

David C. Holzman

Escherichia coli cells carry 46 genes—many previously unrecognized—that enable it to withstand exceptionally high levels of ionizing radiation, according to Michael M. Cox of the University of Wisconsin and his collaborators. These bacteria thus encode “new pathways of cellular self-repair, including DNA pathways that [if present] in humans may help protect us from cancer,” he says. Details appear in the July 2014 *Journal of Bacteriology* (doi:10.1128/JB.01589-14).

High doses of ionizing radiation can be deadly not only to humans, plants, and animals, but also to microbial cells. “Most of the damage occurs because ionizing radiation produces reactive oxygen species in water, and these molecules cause oxidative damage to anything—cellular proteins, DNA, membranes—that they come in contact with,” Cox says.

Nonetheless, some types of bacteria, notably *Deinococcus radiodurans*, are highly resistant to high levels of radiation. *E. coli*, which is not known for its resistance to radiation, can adapt to it under special circumstances, according to Cox and collaborators. They developed resistant strains via directed evolution, subjecting cells of *E. coli* to 20 cycles of gradually increasing levels of radiation—enough to kill 99% of the bacteria at each round—and harvesting the successive survivors.

“In a nutshell, three genes account for most of the new phenotype,” says Cox. However, other genes contribute to that phenotype, too, he adds. “Presumably, there were genes that were not altered in the evolution experiment, but yet were still critical to recovery from the damage inflicted by radiation. The new work is a screen to identify those genes.” Among the 46 genes, “nearly
The capacity of *D. radiodurans* to resist radiation appears ancillary to its resistance to dehydration, notes Richard Fishel of the Ohio State University in Columbus. Unlike *E. coli*, *D. radiodurans* occupies a niche where desiccation is a constant hazard. This causes massive chromosome breakage, he says. Organisms have many ways to resist or survive dehydration, including encapsulating themselves. *D. radiodurans* does so by ensuring that “it has multiple copies of its genome, so that no matter how badly it is thrashed, it can always reassemble it.” Some of the relevant genes are conserved, but *E. coli*, he says, is far less efficient at recombination than is *D. radiodurans*.

David C. Holzman is the Microbe Journal Highlights Editor.

### RESEARCH ADVANCES

**Natural Product from Soil Fungus Blocks Metallo-β-Lactamases**

Carol Potera

Aspergillomarasmine A (AMA), a natural product from soil-dwelling fungi, proves an efficient inhibitor of several types of metallo-β-lactamases, including New Delhi metallo-β-lactamase-1 (NDM-1), according to Gerard Wright at McMaster University in Hamilton, Ontario, Canada, and his collaborators. Because those β-lactamases render bacterial pathogens resistant to carbapenem antibiotics, he and his collaborators are continuing to study this natural product as a candidate to use with carbapenems to overcome that resistance and restore their clinical usefulness, he says.

Wright and his collaborators screened soil samples that were collected from various locations across Canada for activity against carbapenem-resistant strains of gram-negative pathogens. In a preliminary screening assay, AMA, which was extracted from the fungus *Aspergillus versicolor*, boosts the antibacterial activity of the antibiotic meropenem against several strains of *Escherichia coli* that produce NDM-1, they found.

To follow up on that screening, Wright and his group tested AMA and meropenem on 229 strains of gram-negative pathogens of several species, all of which express metallo-β-lactamases, that were collected from patients during the past decade. AMA restored carbapenem killing in 88% of NDM-1-positive samples and 90% of VIM-2-positive samples, according to Wright. Further, when mice were infected with an ordinarily lethal strain of *Klebsiella pneumoniae* containing NDM-1, more than 95% of the mice survived when treated with a single dose of meropenem supplemented with AMA. However, if the ani-