

AMD Projects

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Innovate • Transform • Protect

CDC's Advanced Molecular Detection (AMD) initiative fosters scientific innovation to transform public health and protect people from disease threats.

AMD Projects: Combatting Healthcare-associated Infections

Building advanced molecular detection infrastructure to combat healthcare-associated infections

Untreatable infections threaten a return to the time when simple infections were deadly. Hospitals and other healthcare settings battle to protect their patients from these drug-resistant organisms and prevent their spread to other patients. Predicting how these bacteria will become resistant is a challenge.

When investigating unfamiliar territory, such as the evolution of germs, the use of proven standardized investigative methods decreases confusion as multiple groups work to understand more about a pathogen. It is critical for partners to measure and investigate specific resistant bacteria in the same way, using a common vocabulary and accepted criteria. The study will decode the building blocks of genetic material to reveal how specific genes change and develop over time. This will create detailed family trees for two high-threat germs, *Clostridium difficile*—a germ that causes life-threatening diarrhea—and carbapenem-resistant Enterobacteriaceae (CRE)—a family of germs that have become resistant to all or nearly all the antibiotics we have today.

This study will help CDC establish a new, more robust standard to determine reliably the genetic history of drug-resistant bacteria. Understanding the genetic likeness will help in the development of protocols and procedures for testing and analysis. Ultimately, understanding how *C. difficile* and CRE have changed over time and how they spread will protect more people and reduce infections in healthcare settings.



Clostridium difficile is a common cause of antibiotic-associated diarrhea.

