CDC's AMD Program

AMD Projects

Innovate • Transform • Protect

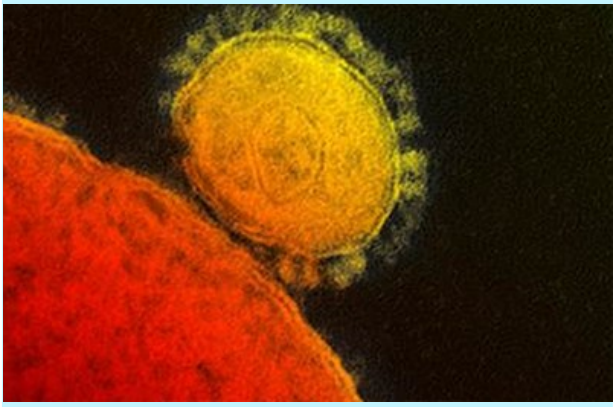
CDC's Advanced Molecular Detection (AMD) program fosters scientific innovation in genomic sequencing, epidemiology, and bioinformatics to transform public health and protect people from disease threats.

AMD Projects: Identifying the Unknown

Using targeted and metagenomic sequencing to identify and characterize pathogens in unknown respiratory

Coughing? It could be whooping cough, the flu, pneumonia, or a slew of other respiratory illnesses. Sometimes during outbreaks it's not easy for medical or public health professionals to determine quickly what's causing respiratory illnesses. This is why CDC brings together highly skilled epidemiology and laboratory respiratory experts to form the Unexplained Respiratory Disease Outbreaks (URDO) work group. CDC epidemiologists look at the characteristics of the disease and patterns of an outbreak. CDC laboratory scientists help solve the mystery by identifying the pathogen causing an outbreak. But, there is a problem. Current diagnostic techniques can be slow and not completely informative, slowing down an effective response to the outbreak.

CDC is developing a new tool to help laboratory scientists



New coronaviruses can appear unexpectedly in different parts of the world, causing outbreaks of respiratory illness. Identifying and stopping respiratory threats quickly increases global health security.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Updated: February 2017

quickly identify which germ—including new or rare ones—is causing an outbreak. With targeted sequencing analysis, scientists will identify and characterize pathogens in respiratory specimens from URDO responses. They hope to also determine the specific strain responsible for an outbreak and whether or not that strain is resistant to antibiotics.

By using a single method, in this case a testing "chip" containing thousands of short strands of genetic material (primer panels) that help start DNA replication, CDC will be able to identify the cause of a respiratory outbreak faster. This will allow for effective prevention and control strategies to be put in place quickly to protect people's health.

For more information on Unexplained Respiratory Disease Outbreaks, please visit the CDC website, www.cdc.gov/urdo/index.html.

2017 Update

In the first two years, CDC project investigators, with the Massachusetts and Minnesota State Public Health Laboratories, have successfully developed and validated primer panels for 19 bacteria and viruses and various drug resistance markers for *Mycoplasma pneumoniae*, influenza A, respiratory syncytial virus, and certain strains of *Legionella pneumophila* and Streptococcus *pneumoniae*. Researchers implemented a standard process to guide the creation and validation of the remaining 35 primer panels that will be included on the final URDO testing chip. Processes for evaluating and analyzing the complex genetic data generated have also been established to identify which germ or germs are present in samples from multiple patients that are simultaneously tested. Over the next year, these new primer panels and processes will be tested both at CDC and by selected health departments in the United States.

Updated: February 2017