

Inexpensive lab test identifies resistant infections in hours

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Researchers from Oregon State Public Health Lab have modified the protocol for a relatively new test for a dangerous form of antibiotic resistance, increasing its specificity to 100 percent. Their research, confirming the reliability of a test that can provide results in hours and is simple and inexpensive enough to be conducted in practically any clinical laboratory was presented at the 54th Interscience Conference on Antimicrobial Agents and Chemotherapy, an infectious disease meeting of the American Society for Microbiology.

The test, called Carba NP, originally developed by Patrice Nordmann and Laurent Poirel at the University of Fribourg, Switzerland, and Laurent Dortet of the University Hospital of the South-Paris Medical School, France, allows for rapid identification of carbapenem-resistant Enterobacteriaceae (CRE), often referred to in the media as "super bugs" for their ability to resist most major antibiotics. Carbapenems are an important class of powerful antibiotics for treating severe infections caused by multidrug-resistant Gram negative bacteria. Carbapenemases are enzymes produced by some bacteria which inactivate these antibiotics.

"Over the past decade carbapenemase-producing CRE (CP-CRE) have rapidly spread around the globe and are currently considered an urgent [public health](#) threat by the Centers for Disease Control and Prevention (CDC)," says Karim Morey of the Oregon State Public Health Lab, an author on the study. "Timely detection of CP-CRE is critical to patient care and infection control."

Polymerase chain reaction (PCR), a DNA-based test, is currently the gold standard for detecting CRE, but it is expensive and requires equipment that many labs just do not have, especially in low-income countries that are large reservoirs for CRE. Carba NP is a much less expensive test that most labs should be able to afford.

In the study Morey and her colleagues evaluated the ability of the Carba NP test to properly identify 59 of the 201 clinical isolates as carbapenemase producers. Using a previously published Mayo Clinic protocol, they correctly identified 92% as being carbapenemase producers, including all strains of NDM-1 and KPC, two important types of CRE. When they adjusted the protocol to increase the inoculum size and tested again they achieved 100% sensitivity. The average time to complete a test was 2.5 hours.

"We conclude that the Carba NP test is highly sensitive, specific and reproducible for the detection of carbapenemase production in a diverse group of organisms," says Morey.

This work was done as part of the Drug Resistant Organism Coordinated Regional Epidemiology Network, a statewide initiative to prevent the emergence and spread of CRE in the state of Oregon and Funded by the CDC.

Also at the meeting Nordmann, Poirel and Dortet presented a new method for identifying extended-spectrum beta-lactamase (ESBL), another dangerous form of [antibiotic resistance](#), directly from urine samples. This new [test](#), which costs only a few dollars to perform and can be implemented in almost any microbiology lab, has a specificity of over 98% and takes 20 minutes to obtain results compared to current methods which can take 1 to 2 days.

More information: This research was presented as part of the ASM's

54th ICAAC held September 5-9, 2014 in Washington, DC.

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