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AusDiagnostics provides new weapons in war against antibiotic resistance

The overuse and misuse of antibiotics has allowed the development of antibiotic-resistant bacteria.

In particular, the emergence of carbapenem resistance in bacteria is a major public health concern because these agents are regarded as one of the last effective therapies available for treating serious infections.

Carbapenemases are key causes of carbapenem resistance and are a particular threat because they can be transferred between different bacterial species and spread rapidly around the world.

Two papers in the *Journal of Antimicrobial Chemotherapy* illustrate very different approaches to the problem. In one (Meunier D, Woodford N, Hopkins KL. Evaluation of the AusDiagnostics MT CRE EU assay for the detection of carbapenemase genes and transferable colistin resistance determinants *mcr-1/-2* in MDR Gram-negative bacteria. *J Antimicrob Chemother* 2018; doi:10.1093/jac/dky347) a new kit for reference laboratories is validated. This kit can detect the rarer Carbapenemase Resistant Enterobacteriaceae (CRE) genes such as SME, GES, SIM, DIM, GIM IMI, SPM, *mcr-1* and *Fri-1* to *Fri-4* in addition to the big 5 (IMP, VIM, OXA-48, KPC and NDM)

Genes like *mcr-1* which confer resistance to the last resort antibiotic, colistin, are critical for infection control units of hospitals and reference laboratories to detect.

In the second publication (Evaluation of multiplex tandem PCR (MT-PCR) assays for the detection of bacterial resistance genes among Enterobacteriaceae in clinical urines. Schmidt et al *J Antimicrob Chemother.* in press) the approach is directed more toward the clinician. Instead of asking the question “what resistance genes are present”, this kit asks the question “which antibiotics can I use on this patient”.

It is designed around difficult cases of urinary tract infections and aims to give a clinician a 90 per cent probability that a particular antibiotic will work in that patient. This approach is directed towards improved antibiotic stewardship by commencing treatment with an antibiotic that likely to be successful on the patient.

Both of these products can be used without the need for nucleic acid extraction of the sample (colony or urine) and save days of culture work to get a result.

Another product in the AusDiagnostics range used for fighting antibiotic resistance is the Bacteraemia kit, which simulates the performance of a MALDI TOF instrument for identifying bacterial species.

This kit is particularly useful for smaller hospitals who don't have immediate access to MALDI TOF.

AusDiagnostics Managing Director Dr Keith Stanley said the team at AusDiagnostics are committed to developing innovative products.

“We are improving the way that laboratory staff and clinicians work. This, in turn, will have better outcomes for patients who are diagnosed with these types of antibiotic-resistance bacteria,” he said.

About AusDiagnostics:

AusDiagnostics registered as an Australian company in 2006 and now employs around 50 staff across four countries. Its proprietary technology, “Multiplexed Tandem PCR”, was patented in 2005 following a START grant from the Australian Government to Corbett Research PTY Ltd. MT-PCR allows multiplexing any number of gene targets and can detect minor pathogens even in the presence of a large abundance of other pathogens. This makes it very useful for dual or multiple infections.

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