Quick microchip test for dangerous antibiotic resistant bacteria

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Researchers at the Veterinary Laboratories Agency in Surrey have developed microchips capable of quickly and cheaply identifying dangerous and drug resistant bacteria in clinical samples, scientists announced today at the Society for General Microbiology's 161st Meeting at the University of Edinburgh, UK.

For the first time doctors and veterinarians will be able to test clinical samples from their patients for the presence of the genes for antibiotic resistance in bacteria, getting the results within 24 hours instead of having to wait for as much as a week.

"We have developed a test chip which can accurately identify 56 virulence genes in the diarrhoea-causing Escherichia coli bacteria and 54 antimicrobial resistance genes covering all the known families of gram-negative bacteria", says Dr Muna Anjum from the UK¡¦s Veterinary Laboratories Agency in Addlestone, Surrey.

The chip will speed up the process of diagnosis and treatment by giving quicker results from clinical testing laboratories. The chip will also make it possible to carry out routine surveillance studies to monitor the way genes for virulence and antimicrobial resistance are spread in the environment, food samples, or even in farm and wild animals.

"Our chips have already been used very successfully in a survey of microbial resistance in human clinical isolates, foods, farm animals and also in wild animals, where we were looking at them as possible

reservoirs of infection which can transmit disease back into farm animals", says Dr Anjum.

The miniaturised microarray chips were developed by studying and identifying the dangerous genes from samples of gut bacteria including the diarrhoea-causing E. coli bacteria and the food poisoning bug Salmonella.

In a test of the new chip screening technique, the most common antibiotic resistance gene was identified in 90% of E. coli and 56% of Salmonella bacteria from a random group of animal and human clinical samples. The tests even identified some unique and previously unknown combinations of virulence genes, whose significance still needs to be determined.

"In the near future, we are planning to automate the method to enable each sample to be tested for up to 600 genes and for 96 samples to be processed in half a day", says Dr Muna Anjum. "This will allow large scale monitoring of bacterial pathogens to see how they gain and lose genes related to disease and its control".

This technology will also allow scientists to search for and identify important genes from other pathogens and bacteria, for instance genes which may be commercially important in industrial processes such as waste handling, plastics production, manufacturing, food processing or pharmaceutical development.

Source: Society for General Microbiology

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