

Spring 2013

# Micro News

News and updates from Microbiology at the Public Health Laboratory

Health  
Protection  
Agency

Find out more information about the tests and services offered at West Midlands Public Health Laboratory at [www.heftpathology.com](http://www.heftpathology.com)

## Next Generation Sequencing Technology in Public Health



### Conventional sequencing has the drawback of being too expensive to use for large scale sequencing such as whole genome sequencing.

New technologies, collectively known as Next generation Sequencing (NGS) are therefore slowly moving from research and development into the diagnostic lab. Like conventional sequencing, NGS will be useful to identify mutations conferring antimicrobial and antiviral resistance but the biggest predicted impact of NGS will be for real-time molecular public health investigations. NGS will allow faster and more extensive sequencing for many pathogens giving us detailed epidemiological typing information. Phylogenetic (family tree type) analysis of the sequence data will allow us to track the identity and relatedness of organisms causing infections both in health care

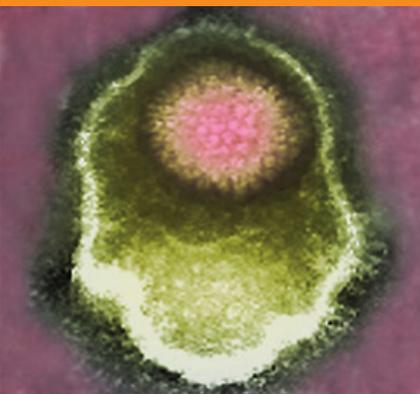
facilities and the community. This will let us investigate how outbreaks like norovirus spread and improve infection control in real time. Our laboratory is very excited about this new era of practical molecular genetics and we are actively involved with NGS projects ranging from Tuberculosis to norovirus and HIV. You can read about our work with TB, in collaboration with Oxford University, in Lancet Infectious Diseases (Feb 2013. Vol. 13 No. 2 pp 137-146).

Please contact us if you would like to find out more or if you have a good project in mind, otherwise watch this space for future updates.

## Quantitative HSV and VZV Assay

The laboratory is now offering quantitative PCR assays on EDTA blood samples for both Herpes Simplex Virus (HSV) and Varicella Zoster Virus (VZV).

This test is being offered in response to an increasing demand for PCR detection of HSV and VZV in blood samples in septic neonates or immunocompromised patients with disseminated HSV / VZV infections. Adding quantitative analysis for these samples is very useful to monitor treatment response. Please contact us if you want more information on where and when to use this test.



Please remember a skin swab for a qualitative HSV and VZV PCR is still the sample of choice to diagnose HSV or VZV infections.

New rapid diagnostics in the laboratory: improving accuracy and speed



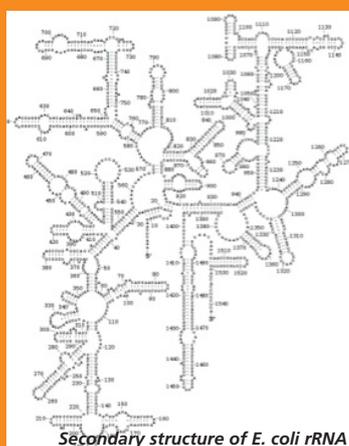
Routine bacterial identification methods of bacteria recovered from clinical isolates can take up to 48 hours in some cases. Organisms can be identified through genetic sequencing, but a new rapid technology is now available using mass spectrometry. Matrix-assisted laser desorption ionisation – time of flight (MALDI-TOF) uses ribosomal protein mass peaks to speciate organisms. Colonies of organisms are placed on a target, which is then heated with a laser triggering desorption. The matrix material coating the target heavily absorbs UV laser light, leading to the ablation of upper layer of the matrix. The hot plume produced during ablation contains many species: neutral and ionized matrix molecules, protonated and deprotonated matrix molecules, matrix clusters and nanodroplets. The mass peaks produced coupled with the travel time allow accurate organism identification within 20 minutes. As part of the modernisation and automation of the microbiology laboratory, the MALDI-TOF will allow rapid cheap throughput and turnover of clinical specimens thus potentially reducing the turnaround time. The robust identification will in the future allow us to increase the range of primary specimens that could be tested, further reducing turnaround times and increasing the information flow to users.

# 16s rDNA PCR and Sequencing

We are pleased to announce that we have now launched 16s rDNA PCR and Sequencing as a new regional specialist reference test.

## What can 16s PCR and Sequencing be used for?

This test is intended to supplement conventional "M,C+S". It can detect and identify bacteria in clinical samples. Because it is based on DNA detection this includes dead bacteria (including those killed by antibiotic treatment) and fastidious/un-culturable bacteria. It can also be used for Identification of bacterial isolates



## What sample types can be tested?

Clinical samples must be from normally sterile sites. Suitable samples include tissue (e.g. native heart valves), aspirates, pus and CSF. All samples should be transported in a sterile container (e.g. universal) without any additives. Samples which have been stored in water, PBS or any other carrier medium are not suitable. Bacterial isolates for identification should be sent on a slope culture. We would be happy to discuss requests for this test prior to sample submission.

## Clinical interpretation of result

All results will receive a clinical validation and interpretation by a



Real Time PCR machine

Consultant Microbiologist who will then telephone the result to the requester. In order to ensure that appropriate interpretation can be undertaken please ensure that relevant clinical details are included on the request form.



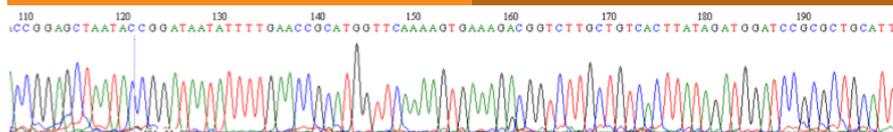
16s PCR can be carried out on bacterial isolates or clinical samples from a sterile site

## Turnaround times and cost

The service will be provided Monday to Friday; with all results being telephoned as soon as they are available. The turnaround time will be within 7 days and the cost of the test will be £43.88 for the current financial year 2012/13.

If you have any queries regarding the service, please contact:

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**Dr Abid Hussain**  
abid.hussain@heartofengland.nhs.uk



Some sequencing data

For all enquiries please contact us on 0121 424 3117  
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