



PAN-PATHOGEN PCR

Compiled by the Microbiologists

1st Quarter 2023

Lancet Laboratories is offering a pan-pathogen PCR that detects 345 bacterial and fungal pathogens as well as *Plasmodium* spp. The technique utilises 16S/18S rRNA gene PCR and sequencing technologies enabling the identification of many organisms.

Clinical diagnostics are moving towards more broad and rapid molecular techniques in order to improve diagnostic yield and turnaround time, where culture-based techniques and singleplex molecular tests have not been sufficient.

This test has been used successfully in patients with infective endocarditis, orthopaedic infections, pneumonia, Mycobacterial infections, wound infections, meningitis, etc.

The turnaround-time is 24 hours from receipt in the molecular pathology laboratory for negative results and 72 hours for a positive result.

List of organisms identified by the pan-pathogen kit:

Gram-negative bacteria	<i>Edwardsiella tarda</i>	<i>Providencia stuartii</i>	<i>Dolosigranulum pigrum</i>	<i>Propionibacterium</i> spp.
<i>Achromobacter xylosoxidans</i>	<i>Elizabethkingia meningoseptica</i>	<i>Pseudomonas</i> spp.	<i>Eggerthella lenta</i>	<i>Rhodococcus</i> spp.
<i>Acidovorax</i> spp.	<i>Enhydrobacter aerosaccus</i>	<i>Ralstonia</i> spp.	<i>Enterococcus</i> spp.	<i>Rothia</i> spp.
<i>Acinetobacter</i> spp.	<i>Enterobacter</i> spp.	<i>Raoultella planticola</i>	<i>Eremococcus coleocola</i>	<i>Staphylococcus</i> spp.
<i>Aeromonas veronii</i>	<i>Escherichia</i> spp.	<i>Rickettsia typhi</i>	<i>Eubacterium</i> spp.	<i>Streptococcus</i> spp.
<i>Afipla broomeae</i>	<i>Fusobacterium</i> spp.	<i>Serratia marcescens</i>	<i>Facklamia</i> spp.	<i>Tropheryma whipplei</i>
<i>Aggregatibacter aphrophilus</i>	<i>Haemophilus</i> spp.	<i>Shigella</i> spp.	<i>Fingoldia magna</i>	<i>Tsukamurella</i> spp.
<i>Anaerotruncus colihominis</i>	<i>Hafnia alvei</i>	<i>Stenotrophomonas maltophilia</i>	<i>Gardnerella vaginalis</i>	<i>Ureaplasma urealyticum</i>
<i>Bacteroides</i> spp.	<i>Helicobacter pylori</i>	<i>Veillonella</i> spp.	<i>Gemella</i> spp.	<i>Vagococcus</i> spp.
<i>Bartonella quintana</i>	<i>Kingella</i> spp.	<i>Weeksella</i> spp.	<i>Gordonia</i> spp.	<i>Wolbachia</i> sp.
<i>Bordetella</i> spp.	<i>Klebsiella</i> spp.	<i>Yersinia</i> spp.	<i>Granulicatella adiacens</i>	Fungi
<i>Borrelia garinii</i>	<i>Kerstesia</i> spp.	Gram-positive bacteria	<i>Janibacter</i> spp.	<i>Aspergillus</i> spp.
<i>Bosea</i> spp.	<i>Kluyvera cryocrescens</i>	<i>Abiotrophia</i> spp.	<i>Kocuria</i> spp.	<i>Candida</i> spp.
<i>Brucella</i> spp.	<i>Lautropia mirabilis</i>	<i>Actinomyces</i> spp.	<i>Lactobacillus</i> spp.	<i>Cladosporium cladosporioides</i>
<i>Burkholderia</i> spp.	<i>Legionella pneumophila</i>	<i>Aerococcus</i> spp.	<i>Lactococcus</i> spp.	<i>Cryptococcus</i> spp.
<i>Campylobacter</i> spp.	<i>Leptotrichia</i> spp.	<i>Alloiococcus otitis</i>	<i>Leifsonia</i> spp.	<i>Didymella exitialis</i>
<i>Cand. Neoehrlichia mikurensis</i>	<i>Massilia</i> spp.	<i>Anaerococcus</i> spp.	<i>Listeria monocytogenes</i>	<i>Davidiella tassiana</i>
<i>Capnocytophaga</i> spp.	<i>Methylobacterium</i> spp.	<i>Atopobium</i> spp.	<i>Microbacterium</i> spp.	<i>Fusarium</i> spp.
<i>Chryseobacterium indologenes</i>	<i>Moraxella</i> spp.	<i>Bacillus</i> spp.	<i>Micrococcus</i> spp.	<i>Malassezia</i> spp.
<i>Citrobacter freundii</i>	<i>Morganella morganii</i>	<i>Blifidobacterium</i> spp.	<i>Mogibacterium timidum</i>	<i>Pseudallescheria boydii</i>
<i>Cloacibacterium normanense</i>	<i>Neisseria</i> spp.	<i>Brevibacterium</i> spp.	<i>Mycobacterium</i> spp.	<i>Saccharomyces cerevisiae</i>
<i>Comamonas testosteroni</i>	<i>Pantoea agglomerans</i>	<i>Carnobacterium</i> spp.	<i>Mycoplasma</i> spp.	<i>Schizophyllum radiatum</i>
<i>Coxiella burnetii</i>	<i>Paracoccus</i> spp.	<i>Clostridium</i> spp.	<i>Nocardia</i> spp.	<i>Sporobolomyces</i> spp.
<i>Cronobacter sakazakii</i>	<i>Pasteurella</i> spp.	<i>Coprococcus catus</i>	<i>Paenibacillus</i> spp.	<i>Issatchenkia orientalis</i>
<i>Curvibacter</i> spp.	<i>Porphyromonas</i> spp.	<i>Corynebacterium</i> spp.	<i>Parvimonas micra</i>	
<i>Delftia</i> spp.	<i>Prevotella</i> spp.	<i>Dermabacter hominis</i>	<i>Peptoniphilus</i> spp.	Protist
<i>Dialister</i> spp.	<i>Proteus</i> spp.	<i>Dietzia</i> spp.	<i>Peptostreptococcus</i> spp.	<i>Plasmodium</i> spp.

Advantages:

- Highly sensitive and specific
- Improved time to diagnosis
- Diagnosis in patients on antibiotics/antifungals
- Diagnosis in culture negative cases
- Both bacterial and fungal pathogens can be detected
- Cost-saving by minimising unnecessary additional tests and directing treatment

Limitations:

- Certain organisms are only identified to species level
- List of organisms not exhaustive

Sample Types:

- Tissue
- Swabs
- Urine
- CSF
- Respiratory samples
- Fluid/aspirates

References

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