

INTRODUCING: Blood Culture Identification Panel 2 (BCID2)

A new version of the BioFire FilmArray Blood Culture Identification Panel has been released. This panel, the BCID2, features an expanded array of targets, including additional bacterial and fungal pathogens and an increased number of resistance determinants. The new panel will replace the old panel effective **July 6, 2021**. The panel will continue to be run on the first positive blood culture bottle from a patient in a single episode (defined as no previous positive blood within 5 days). The BCID2 panel will only be run on subsequent positives if the Gram stain differs.

To facilitate easier interpretation, the panel will now be given its own test code (BCID2), aka Blood Culture ID, NAA. When a positive culture is obtained by microbiology, the laboratory will place an order for the BCID2, and results of the panel can be found under this order. The table below shows all of the targets on the new panel and indicates targets that have been added.

Gram Negative Bacteria	Gram Positive Bacteria	Antimicrobial Resistance Genes	Yeast
<i>Acinetobacter calcoaceticus-baumannii</i> complex	<i>Enterococcus faecalis</i>	Carbapenemases	<i>Candida albicans</i>
Enterobacterales	<i>Enterococcus faecium</i>	IMP*	<i>Candida auris</i> *
<i>Enterobacter cloacae</i> complex	<i>Listeria monocytogenes</i>	KPC	<i>Candida glabrata</i>
<i>Escherichia coli</i>	<i>Staphylococcus</i>	OXA-48-like*	<i>Candida krusei</i>
<i>Klebsiella aerogenes</i> *	<i>Staphylococcus aureus</i>	NDM*	<i>Candida parapsilosis</i>
<i>Klebsiella oxytoca</i>	<i>Staphylococcus epidermidis</i> *	VIM*	<i>Candida tropicalis</i>
<i>Klebsiella pneumoniae</i> group	<i>Staphylococcus lugdunensis</i> *	<u>Colistin Resistance</u>	<i>Cryptococcus neoformans/gattii</i> *
<i>Proteus</i> spp.	<i>Streptococcus</i>	<i>mcr-1</i>	
<i>Salmonella</i> *	<i>Streptococcus agalactiae</i>	<u>ESBL</u>	
<i>Serratia marcescens</i>	<i>Streptococcus pneumoniae</i>	CTX-M*	
<i>Haemophilus influenzae</i>	<i>Streptococcus pyogenes</i>	<u>Methicillin Resistance</u>	
<i>Neisseria meningitidis</i>		<i>mecA/C</i>	
<i>Pseudomonas aeruginosa</i>		<i>mecA/C and MREJ (MRSA)</i> *	
<i>Stenotrophomonas maltophilia</i> *		<u>Vancomycin Resistance</u>	
		<i>vanA/B</i> *	

*Indicates a new addition to the panel

HIGHLIGHTS OF RELEVANT CHANGES OR ADDITIONS:

- *Enterobacteriaceae* has been updated to *Enterobacterales* to reflect a recent taxonomic update. This remains a broad target that will be positive when an organism within the order *Enterobacterales* is present in the sample. Within the panel are targets for commonly encountered *Enterobacterales*, like *E. coli*, but other *Enterobacterales* will only be positive for the order specific target, such as *Citrobacter* species.
- The panel detects CTX-M the most common ESBL gene in the United States, along with five of the most common carbapenemase genes (KPC, NDM, IMP, OXA-48-like, and VIM).
- The panel includes *mecA/C* detection with and without MREJ to differentiate *mecA/C* in coagulase negative Staphylococci and *mecA/C* in *S. aureus* when polymicrobial samples are tested.
 - *mecA/C* will only be reported when *S. aureus*, *S. epidermidis*, and/or *S. lugdunensis* are detected. Other coagulase negative staph detections are considered contaminants and *mecA/C* is not reported by the panel to discourage unnecessary antibiotic use.

TESTING DETAILS

Turn Around Time

- Blood cultures incubated at main laboratory: Generally, within 2 hours of culture positivity
- Blood cultures incubated at Acute Care Labs: Generally, within 6 hours of Gram stain report

Reporting and Interpretation

Results will be entered under a different test code than the blood culture order. Each organism on the panel and resistance gene targets that are valid for the detected organisms will be reported as Detected or Not Detected. An example report is shown below.

Blood Culture Identification Results

Results of the BCID2 should be used to guide therapy. However, resistance to antibiotics can occur via multiple mechanisms. All positive bottles will be cultured, and phenotypic susceptibility results will be reported to guide any necessary updates to therapy.

OBL-BLOOD CULTURE ID, NAA: Patient Communication
Not Released X Not seen

OBL-BLOOD CULTURE ID, NAA (Order 4203916)

Results

6/3/2021 3:11 PM - Interface, Health Network Labs Results In

Specimen Information: Specimen (LAB)

Component	Value	Flag	Ref Range	Units	Status	Lab
E. faecalis, PCR	Not Detected		Not Detected		Final	HNL1
E. faecium, PCR	Not Detected		Not Detected		Final	HNL1
L. monocytogenes, PCR	Not Detected		Not Detected		Final	HNL1
Staphylococcus species, PCR	Not Detected		Not Detected		Final	HNL1
S. aureus, PCR	Not Detected		Not Detected		Final	HNL1
S. epidermidis, PCR	Not Detected		Not Detected		Final	HNL1
S. lugdunensis, PCR	Not Detected		Not Detected		Final	HNL1
Streptococcus species, PCR	Not Detected		Not Detected		Final	HNL1
S. agalactiae, PCR	Not Detected		Not Detected		Final	HNL1
S. pneumoniae, PCR	Not Detected		Not Detected		Final	HNL1
S. pyogenes, PCR	Not Detected		Not Detected		Final	HNL1
A. baumannii complex, PCR	Not Detected		Not Detected		Final	HNL1
B. fragilis, PCR	Not Detected		Not Detected		Final	HNL1
Enterobacteriales, PCR	Detected	!	Not Detected		Final	HNL1
E. cloacae complex, PCR	Not Detected		Not Detected		Final	HNL1
E. coli, PCR	Not Detected		Not Detected		Final	HNL1
K. aerogenes, PCR	Not Detected		Not Detected		Final	HNL1
K. oxytoca, PCR	Not Detected		Not Detected		Final	HNL1
K. pneumoniae group, PCR	Detected	!	Not Detected		Final	HNL1
Proteus species, PCR	Not Detected		Not Detected		Final	HNL1
Salmonella species, PCR	Not Detected		Not Detected		Final	HNL1
S. marcescens, PCR	Not Detected		Not Detected		Final	HNL1
H. influenzae, PCR	Not Detected		Not Detected		Final	HNL1
N. meningitidis, PCR	Not Detected		Not Detected		Final	HNL1
P. aeruginosa, PCR	Not Detected		Not Detected		Final	HNL1
S. maltophilia, PCR	Not Detected		Not Detected		Final	HNL1
CTX-M, PCR	Detected	!	Not Detected		Final	HNL1
IMP, PCR	Not Detected		Not Detected		Final	HNL1
KPC, PCR	Not Detected		Not Detected		Final	HNL1
mcr-1, PCR	Not Detected		Not Detected		Final	HNL1
NDM, PCR	Detected	!	Not Detected		Final	HNL1
OXA 48 LIKE, PCR	Not Detected		Not Detected		Final	HNL1
VIM, PCR	Not Detected		Not Detected		Final	HNL1
C. albicans, PCR	Not Detected		Not Detected		Final	HNL1
C. auris, PCR	Not Detected		Not Detected		Final	HNL1
C. glabrata, PCR	Not Detected		Not Detected		Final	HNL1
C. krusei, PCR	Not Detected		Not Detected		Final	HNL1
C. parapsilosis, PCR	Detected	!	Not Detected		Final	HNL1
C. tropicalis, PCR	Not Detected		Not Detected		Final	HNL1
C. neoformans/gattii, PCR	Not Detected		Not Detected		Final	HNL1
Comment	PENDING				Incomplete	CORE

Genus Specific Target →

Genus Specific Target →

Order Specific Target →

Resistance Markers
Genes that are not applicable, such as mecA/C when no Staph species is detected are hidden.

INTERPRETATION

In the above example *Enterobacterales*, *E. coli*, CTX-M, NDM, and *C. parapsilosis* were detected. This indicates that the blood culture is positive for an *E. coli* carrying CTX-M and NDM and treatment with cephalosporins and carbapenems will likely be ineffective. Phenotypic susceptibility will be performed to confirm these results. The culture also is positive for the yeast *Candida parapsilosis* and treatment with an antifungal may be warranted. Based on this molecular test, the expected Gram stain to correlate with these results would be Gram negative rods and yeast.