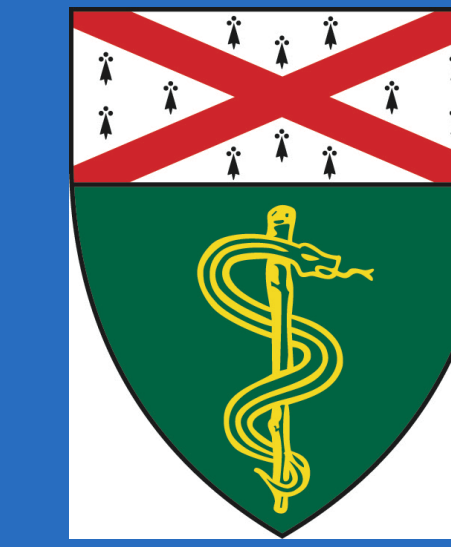


Evaluation of the BioFire Blood Culture Identification (BCID2) panel for transplant recipients with a bloodstream infection

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Background

- The BioFire blood culture identification (BCID2) is a multiplex PCR panel applied to positive blood cultures that detects 43 targets (including bacteria, *Candida* and resistance genes)
- In patients with bloodstream infections (BSI), the BioFire blood culture identification (BCID2) multiplex PCR panel is associated with:
 - Decreased time to organism identification¹
 - Decreased time to antimicrobial susceptibility results needed to guide optimal therapy²
- While the performance of BCID2 has been evaluated in the general population^{3,4}, data for transplant recipients are limited

Methods

Design: Retrospective cohort study

Participants:

- Solid organ recipients (SOTR) and bone marrow transplant recipients (BMTR) within 2 years of transplantation with BSI and BCID2
- Positive blood cultures for the same patient and same organism(s) occurring within 14 days of the initial test were considered a single BSI event

Data collection: Medical records reviewed for demographics and microbiological data.

Analysis: Descriptive statistics.

Objective

We sought to identify the clinical utility of the BCID2 panel in transplant recipients.

Results

Table 1: Demographics

	N	%
Age (years)		
18 to 29	5	11.1
30 to 39	2	4.4
40 to 49	5	11.1
50 to 59	13	28.9
60 to 69	18	40.0
70 to 79	2	4.4
Transplant type		
Allo-SCT	25	55.6
Auto-SCT	5	11.1
CAR-T	1	2.2
Heart	0	0.0
Kidney	10	22.2
Liver	4	8.9
Setting		
Inpatient	36	80.0
Outpatient	9	20.0
Blood culture source		
Central line	21	46.7
Peripheral	24	53.3
Length of stay		
2 - 7 days	7.0	15.6
8 - 14 days	4.0	8.9
15 - 30 days	13.0	28.9
31 - 90 days	6.0	13.3
>90 days	2.0	4.4
NA	13.0	28.9
Length of stay		
0 - 7 days	15	33.3
8 - 14 days	6	13.3
15 - 30 days	7	15.6
31 - 90 days	4	8.9
NA	13	28.9

- A total of **29 transplant recipients** were identified
- 45 positive blood cultures** underwent BCID2 testing
- Mean age was 54 years
- BCID2 did not detect 7/51 (14%) organisms** identified by blood cultures
 - Including monomicrobial (n=6/39) and polymicrobial (n=1/6) cultures
- All 7 organisms not identified by BCID2 were "off-target"** (not in the BCID2 database)
 - All occurred in BMTR
 - 4 were considered pathogenic** and treated with antimicrobials
 - 3 contaminants**
- BCID2 detected resistance markers (CTX-M or Van A/B) in all 15 samples**
 - Ceftriaxone (n=9)
 - Vancomycin resistance (n=6)

Table 2: BCID2 panel results

	N	%
Organisms detected by biofire		
One organism	34	75.6
Two organisms	5	11.1
None detected	6	13.3
Biofire organisms		
<i>Candida glabrata</i>	2	4.0
<i>Candida krusei</i>	1	2.0
<i>Enterobacter cloacae</i> complex	2	4.0
<i>Enterococcus faecalis</i>	2	4.0
<i>Enterococcus faecium</i>	8	16.0
<i>Escherichia coli</i>	11	22.0
<i>Klebsiella pneumoniae</i> group	9	18.0
Not Detected	6	12.0
<i>Pseudomonas aeruginosa</i>	3	6.0
<i>Serratia marcescens</i>	1	2.0
<i>Streptococcus pneumoniae</i>	1	2.0
<i>Streptococcus</i> spp.	4	8.0
Congruence of organism identification		
Correct	38	84.4
Did not identify organism	6	13.3
Did not identify all organisms	1	2.2
Accuracy by number of organisms		
Monomicrobial (n=39)	33	84.6
Polymicrobial (n=6)	5	83.3
Biofire resistance		
CTX-M	9	19.6
vanA/B	6	13.0
None detected	19	41.3
Not assessed	12	26.1
Accuracy of resistance detection		
Correct	15	100.0

Conclusions

- In transplant recipients,
 - BCID2 detected **86% of organisms and 100% of resistance markers** identified by conventional testing
- All 7 (14%) missed cases involved off-target organisms**
 - Of which **4 were considered pathogenic**
- BCID2 is a useful tool for BSI detection in transplant recipients
 - But providers should consider the possibility of off-target pathogens when clinically appropriate

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Disclosures

The authors have no financial disclosures relevant to this study.



BioFire™ FilmArray® Blood Culture Identification Panel BCID/BCID2

Table 3: Characteristics of unidentified isolated by BCID2

Blood culture #1	Blood culture #2	Age	Transplant type	Syndrome	Pathogenic	Treatment	Outcomes
Achromobacter species		62	Allo-SCT	Neutropenic fever	Yes	Minocycline for 10 days	Alive at last follow up (3/28)
<i>Candida guilliermondii</i>		52	Allo-SCT	Candidemia	Yes	Anidulafungin for 3 months	Alive at last follow up (4/4)
<i>Corynebacterium jeikeium</i>		57	Allo-SCT	MRSA bacteremia	Contaminant	NA	Alive at last follow up (9/6/21)
<i>Enterococcus faecalis</i> *	<i>Leuconostoc lactis</i>	59	Allo-SCT	<i>E. faecalis</i> bacteremia	Contaminant	NA	Died (11/29/21)
<i>Roseomonas mucosa</i>		56	Allo-SCT	Neutropenic fever	Yes	Meropenem for 20 days	Alive at last follow up (3/29)
<i>Sphingopyxis alaskensis</i>		64	Allo-SCT	Asymptomatic screening	Yes	Ciprofloxacin for 7 days	Died (08/16/21)
<i>Sphingopyxis alaskensis</i>		64	Allo-SCT	MSSA bacteremia	Contaminant	NA	Died (08/16/21)

*Not missed