

Supplementary Table 1. Major studies evaluating the performance of FDA approved/cleared multiplex molecular panels for testing positive blood culture bottles

Study	Ward et al. (1)				Bhatti et al. (2)						Salimnia et al. (3)		Altun et al. (4)				Wojewoda et al. (5)			Mestas et al. (6)				Sullivan et al. (7)		Ledeboer et al. (8)					
	Verigene Gram-Positive and Gram-Negative Blood Culture Test		FilmArray BCID panel		FilmArray BCID panel			Verigene Gram-Positive and Gram-Negative Blood Culture Test RUO			FilmArray BCID panel		FilmArray BCID panel		FilmArray BCID panel		Verigene Gram-Positive Blood Culture Test			Verigene Gram-Positive Blood Culture Test				Verigene Gram-Negative Blood Culture Test		Verigene Gram-Negative Blood Culture Test					
	Sensitivity (%)	Specificity (%)	Sensitivity (%)	Specificity (%)	Correctly Identified (%)	Misidentified (%)	Not Identified (%)	Misidentified (%)	Correctly Identified (%)	Not Identified (%)	Sensitivity (%)	Specificity (%)	TP/FP	TN/FN	Sensitivity (%)	Specificity (%)	Number (actual/expected) of blood cultures with Verigene results	Sensitivity (%)	Specificity (%)	Number tested	Number correctly identified	Sensitivity (%)	Specificity (%)	Number of isolates correctly identified/number of isolates tested (%)	PPA (%)	NPA (%)					
<i>Staphylococcus</i> species	23/24 (95.8)	149/149 (100)	69/69 (100)	104/104 (100)	64 (100)				64 (100)		770/798 (96.5)	1,397/1,409 (99.1)					25/25	100	100												
<i>Staphylococcus aureus</i>	17/17 (100)	156/156 (100)	17/17 (100)	156/156 (100)	32 (100)				32 (100)		253/257 (98.4)	1,946/1,950 (99.8)	22/0	178/0	100	100	44/44	100	100	36	36	100	100								
<i>Staphylococcus epidermidis</i>	44/44 (100)	128/129 (99.2)							23 (100)								25/25	100	100	65	64	100	99.4								
<i>Staphylococcus lugdunensis</i>									1 (100)								1/1	100	100	1	1	100	100								
<i>Streptococcus</i> species	8/11 (72.7)	162/162 (100)	11/11 (100)	159/162 (98.1)	9 (100)				9 (100)		198/203 (97.5)	1,999/2,004 (99.8)					13/17	76.5	100												
<i>Streptococcus agalactiae</i>	3/3(100)	169/170(99.4)	3/3(100)	169/170 (99.4)	2 (100)				2 (100)		36/36 (100)	2,171/2,171 (100)	5/0	195/0	100	100	6/6	100	100	6	6	100	100								
<i>Streptococcus pyogenes</i>					1 (100)				1 (100)		38/38 (100)	2,168/2,169 (99.9)	3/0	197/0	100	100	1/1	100	100	6	5	83.3	100								
<i>Streptococcus pneumoniae</i>	1/1 (100)	170/172 (98.8)	1/1 (100)	172/172 (100)							36/37 (97.3)	2,168/2,170 (99.9)	14/0	186/0	100	100	5/2	100	98.2	5	5	100	100								
<i>Streptococcus anginosus</i> group									1 (100)								4/4	100	100												
<i>Enterococcus</i> species			8/8 (100)	165/165 (100)	9 (100)						127/130 (97.7)	2,073/2,077 (99.8)	16/5	177/2	88.9	97.3															
<i>Enterococcus faecalis</i>	1/2 (50)	171/171 (100)							5 (100)								13/13	100	100	13	12	92.3	100								
<i>Enterococcus faecium</i>	5/5 (100)	167/168 (99.4)							4 (100)								27/29	93.1	100	15	15	100	100								
<i>Listeria</i> species																															
<i>Listeria monocytogenes</i>											36/36 (100)	2,171/2,171 (100)	2/0	198/0	100	100															
<i>Klebsiella oxytoca</i>	2/2 (100)	171/171 (100)	1/2 (50)	171/171 (100)	1 (100)				1 (100)		59/64 (92.2)	2,142/2,143 (99.9)	3/0	197/0	100	100								2/3 (67%)	63/66 (95.5)	1,726/1733 (99.6)					
<i>Klebsiella pneumoniae</i>	4/4 (100)	169/169 (100)	4/4 (100)	168/169 (99.4)	6 (100)				6 (100)		102/105 (97.1)	2,093/2,102 (99.6)	9/0	191/0	100	100								10/10 (100%)	339/365 (92.9)	1,433/1434 (99.9)					
<i>Serratia marcescens</i>					2 (100)				1 (50)	1 (50)	76/77 (98.7)	2,129/2,130 (99.9)												6/6 (100%)							
<i>Proteus</i> species											39/39 (100)	2,168/2,168 (100)													0/1 (0%)	75/75 (100)	1,722/1724 (99.9)				
<i>Acinetobacter</i> species	1/2 (50)	171/171 (100)																							4/4 (100%)	60/61 (98.4)	1,736/1738 (99.9)				
<i>Acinetobacter baumannii</i>											51/51 (100)	2,151/2,156 (99.8)																			
<i>Haemophilus influenzae</i>											43/43 (100)	2,164/2,164 (100)	2/0	198/0	100	100															
<i>Neisseria meningitidis</i>											36/36 (100)	2,171/2,171 (100)	1/0	199/0	100	100															
<i>Pseudomonas aeruginosa</i>	2/2 (100)	171/171 (100)	2/2 (100)	146/171 (85.4)	4 (100)				4 (100)		51/52 (98.1)	2,154/2,155 (99.9)	4/0	196/0	100	100								16/16 (100%)	176/178 (98.9)	1,620/1621 (99.9)					
<i>Enterobacteriaceae</i>			2/2 (100)	171/171 (100)	23 (100)						490/498 (98.4)	1,705/1,709 (99.8)																			
<i>Escherichia coli/Shigella</i> species	29/29 (100)	144/144 (100)	29/29 (100)	144/144 (100)	11 (100)				11 (100)		150/153 (98.0)	2,049/2,054 (99.8)	39/0	160/1	97.5	100								23/24 (96%)	675/675(100)	1,118/1124 (99.5)					
<i>Enterobacter</i> species	4/4 (100)	169/169 (100)	4/4 (100)	169/169 (100)					1 (100)															13/14 (93%)	144/145 (99.3)	1,918/1924 (99.7)					
<i>Enterobacter cloacae</i> complex					1 (100)						38/39 (97.4)	2,165/2,168 (99.9)	2/0	198/0	100	100															
<i>Citrobacter</i> species	2/2 (100)	170/171 (99.4)							1 (100)															5/6 (83%)	58/58 (100)	1,750/1751 (99.9)					
Yeasts																															
<i>Candida albicans</i>											64/64 (100)	2,139/2,143 (99.8)	7/1	192/0	100	99.5															
<i>Candida glabrata</i>					27 (100)				25 (96)		49/49 (100)	2,156/2,158 (99.9)	4/0	196/0	100	100															
<i>Candida krusei</i>											37/37 (100)	2,170/2,170 (100)																			
<i>Candida parapsilosis</i>											59/61 (96.7)	2,144/2,146 (99.9)																			
<i>Candida tropicalis</i>											39/39 (100)	2,168/2,168 (100)																			
Resistance genes																															
<i>mecA</i>													24/2	173/1	96	98.9	44/44	100	100												
<i>vanA</i>																	23/24	95.8	100												
<i>vanB</i>																															
<i>bla_{KPC}</i>					1 (100)				1 (100)															7/7 (100%)	53/53 (100)	1746/1746 (100)					
<i>bla_{NDM}</i>																								1/1 (100%)	51/53 (96.2)	1746/1746 (100)					
<i>bla_{OXA}</i>																								1/1 (100%)	66/70 (94.3)	1728/1729 (99.9)					
<i>bla_{VIM}</i>																								3/3 (100%)	68/68 (100)	1731/1731 (100)					
<i>bla_{IMP}</i>																								1/2 (50%)	47/47 (100)	1752/1752 (100)					
<i>bla_{CTX-M}</i>								1(100)																19/19 (100%)	181/183 (98.9)	1616/1616 (100)					
Comparator methods/Gold standard used to assess assay performance	Isolates were identified using Vitek 2 (bioMérieux), MALDI TOF MS and biochemical methods. Susceptibility testing was performed per routine protocol with Vitek 2.				Isolates were identified using Vitek MS RUO (bioMérieux). Susceptibility testing was performed per routine protocol with Vitek 2 using the following cards: AST-GP67, AST-ST01, and AST-GN75.						Isolates were identified using standard phenotypic procedures used in each laboratory and automated methods including MicroScan Walk-Away (Siemens Medical Solutions), Vitek 2, and Phoenix (BD Diagnostics). <i>A. baumannii</i> was identified by bidirectional 16S rRNA gene PCR/sequencing.				Isolates were identified using MALDI-TOF MS, Vitek2 XL and by a panel of desktop spot and agglutination tests. Susceptibility testing was done by disc diffusion.				Isolates were identified using PNA-FISH, Vitek 2 and biochemical methods. Susceptibility testing was performed with Vitek 2.			Isolates were identified using Vitek 2 and other biochemical tests. Discordant results were confirmed by MALDI-TOF MS or 16S rRNA gene PCR/sequencing.				Isolates were identified using Vitek 2 and/or Phoenix automated systems. Bidirectional 16S rRNA gene PCR/sequencing was used for discrepant resolution.					

TP = True positive, TN = True negative, FP = False positive, FN = False negative, PPA = Positive percent agreement, NPA = Negative percent agreement

References:

1. **Ward C, Stocker K, Begum J, Wade P, Ebrahimsa U, Goldenberg SD.** 2015. Performance evaluation of the Verigene (Nanosphere) and FilmArray (BioFire) molecular assays for identification of causative organisms in bacterial bloodstream infections. *European Journal of Clinical Microbiology & Infectious Diseases* **34**:487-496.
2. **Bhatti MM, Boonlayangoor S, Beavis KG, Tesic V.** 2014. Evaluation of FilmArray and Verigene systems for rapid identification of positive blood cultures. *Journal of Clinical Microbiology* **52**:3433-3436.
3. **Salimnia H, Fairfax MR, Lephart PR, Schreckenberger P, DesJarlais SM, Johnson JK, Robinson G, Carroll KC, Greer A, Morgan M, Chan R, Loeffelholz M, Valencia-Shelton F, Jenkins S, Schuetz AN, Daly JA, Barney T, Hemmert A, Kanack KJ.** 2016. Evaluation of the FilmArray blood culture identification panel: results of a multicenter controlled trial. *Journal of Clinical Microbiology* **54**:687-698.
4. **Altun O, Almuhayawi M, Ullberg M, Ozenci V.** 2013. Clinical evaluation of the FilmArray blood culture identification panel in identification of bacteria and yeasts from positive blood culture bottles. *Journal of Clinical Microbiology* **51**:4130-4136.
5. **Wojewoda CM, Sercia L, Navas M, Tuohy M, Wilson D, Hall GS, Procop GW, Richter SS.** 2013. Evaluation of the Verigene Gram-positive blood culture nucleic acid test for rapid detection of bacteria and resistance determinants. *Journal of Clinical Microbiology* **51**:2072-2076.
6. **Mestas J, Polanco CM, Felsenstein S, Dien Bard J.** 2014. Performance of the Verigene Gram-positive blood culture assay for direct detection of Gram-positive organisms and resistance markers in a pediatric hospital. *Journal of Clinical Microbiology* **52**:283-287.
7. **Sullivan KV, Deburger B, Roundtree SS, Ventrola CA, Blecker-Shelly DL, Mortensen JE.** 2014. Pediatric multicenter evaluation of the Verigene gram-negative blood culture test for rapid detection of inpatient bacteremia involving gram-negative organisms, extended-spectrum beta-lactamases, and carbapenemases. *Journal of Clinical Microbiology* **52**:2416-2421.
8. **Ledeboer NA, Lopansri BK, Dhiman N, Cavagnolo R, Carroll KC, Granato P, Thomson R, Jr., Butler-Wu SM, Berger H, Samuel L, Pancholi P, Swyers L, Hansen GT, Tran NK, Polage CR, Thomson KS, Hanson ND, Winegar R, Buchan BW.** 2015. Identification of Gram-negative bacteria and genetic resistance determinants from positive blood culture broths by use of the Verigene Gram-negative blood culture multiplex microarray-based molecular assay. *Journal of Clinical Microbiology* **53**:2460-2472.