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First evaluation of a commercial multiplex PCR panel for rapid detection of pathogens associated with acute joint infections

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BIOFIRE Joint Infection Panel Targets		
Gram-positive bacteria	**Gram-negative bacteria**	**Yeasts**
Anaerococcus prevotii/vaginalis	*Bacteroides fragilis*	*Candida spp.***
Clostridium perfringens	*Citrobacter*	*Candida albicans*
Cutibacterium avidum/granulosum	*Enterobacter cloacae complex*	
Enterococcus faecalis	*Escherichia coli*	
Enterococcus faecium	*Haemophilus influenzae*	
Finegoldia magna	*Kingella kingae*	
Parvimonas micra	*Klebsiella aerogenes*	
Peptoniphilus	*Klebsiella pneumoniae group*	
Peptostreptococcus anaerobius	*Morganella morganii*	
Staphylococcus aureus	*Neisseria gonorrhoeae*	
Staphylococcus lugdunensis	*Proteus spp.*	
*Streptococcus spp**	*Pseudomonas aeruginosa*	
Streptococcus agalactiae	*Salmonella spp.*	
Streptococcus pneumoniae	*Serratia marcescens*	
Streptococcus pyogenes		
Antimicrobial resistance genes		
Carbapenemases		
IMP, KPC, NDM, Oxa-48-like, VIM		
Methicillin Resistance		
mecA/C and MREJ		
Extended Spectrum Beta-Lactamase		
CTX-M		
Vancomycin Resistance		
vanA/B		

Table S1. Overview of microorganisms and antimicrobial resistance genes present in the BIOFIRE JI Panel. Data can be found online (BIOFIRE JI Panel: https://www.biofiredx.com/products/the-filmarray-panels/ji/, last access: 30 November 2022). * All streptococci are included in the JI Panel, but only *S. agalactiae*, *S. pneumoniae* and *S. pyogenes* results are narrowed down to specific specie. For the other streptococci species, the BIOFIRE JI result is *''Streptococcus spp''*. ** As mentioned before, but now applicable to candida species.

Pt nr	Clinical suspicion of	Infection by criteria?	BIOFIRE JI result	Synovial fluid culture	Tissue cultures	Sonication fluid culture	Gram Staining
1	Acute native	Yes, SA	*S. pneumoniae*	*S. pneumoniae*	-	-	No bacteria or yeast ****
2	Acute native	Yes, SA	*S. pyogenes*	*S. pyogenes*	Negative	-	No bacteria or yeast ****
3	Acute native	Yes, SA	*St. aureus*	*St. aureus*	*St. aureus* (4/5)	-	No bacteria or yeast ****
4	Acute native	Yes, SA	*H. influenzae*	*H. influenzae*	Negative	-	No bacteria or yeast ****
5	Acute native	Yes, SA	*Streptococcus spp*	*S. dysgalactiae/canis*	*S. dysgalactiae/canis* (1/2)	-	Gram-positive cocci
6	Early acute PJI	Yes, PJI	*E. cloacae complex*	*E. cloacae complex*	-	-	Not performed
7	Early acute PJI	Yes, PJI	*St. aureus*	*St. aureus*	*St. aureus* (6/6)	*S. aureus*	No bacteria or yeast ****
8	Early acute PJI	Yes, PJI	*Streptococcus spp* **	*S. mitis* + *St. epidermidis* + *Corynebacterium spp.*	*S. capitis* (5/6) + *St. epidermidis* (6/6) + *Corynebacterium spp.* (6/6) + *S. mitis* (5/6)	-	No bacteria or yeast ****
9	Early acute PJI	Yes, PJI	*S. agalactiae*	*S. agalactiae (group B)*	*S. agalactiae (group B)* (4/4)	*S. agalactiae (group B)*	No bacteria or yeast ****
10	Early acute PJI	Yes, PJI	*En. faecalis* **	*En. faecalis* + *C. tuberculostearicum*	*En. faecalis (5/5)* + *C. tuberculostearicum* (3/5)	-	No bacteria or yeast ****
11	Late acute PJI	Yes, PJI	*Streptococcus spp.*	*S. dysgalactiae*	-	-	Gram positive cocci in chains
12	Late acute PJI	Yes, PJI	*Es. coli*	*Es. coli*	*Es. coli* (2/4)	-	No bacteria or yeast ****
13	Late acute PJI	Yes, PJI	*St. aureus*	*St. aureus*	*St. aureus* (2/4)	Negative	Gram-positive cocci in clusters
14	Late acute PJI	Yes, PJI	*S. pyogenes*	*S. pyogenes (group A)*	*S. pyogenes (group A)* (4/5)	*S. pyogenes (group A)*	Gram positive cocci in chains
15	Late acute PJI	Yes, PJI	*Streptococcus spp.* **	*S. vestibularis*	*S. vestibularis* (5/5) + *St. capitis* (5/5) + *St. epidermidis* (2/5)	-	Gram positive cocci in chains
16	Late acute PJI	Yes, PJI	*St. aureus*	*St. aureus*	-	-	Gram-positive cocci in clusters
17	Late acute PJI	Yes, PJI	*St. lugdunensis*	*St. lugdunensis*	*St. lugdunensis* (5/5)	-	No bacteria or yeast ****
18	Late acute PJI	Yes, PJI	*Streptococcus spp.*	*S. mutans*	*S. mutans* (4/4)	*S. mutans*	No bacteria or yeast ****
19	Late acute PJI	Yes, PJI	*Streptococcus spp.*	*S. dysgalactiae/canis*	*S. dysgalactiae/canis* (3/4)	-	Gram positive cocci in chains
20	Late acute PJI	Yes, PJI	*E. cloacae complex*	*E. cloacae complex*	*E. cloacae complex* (5/5)	*E. cloacae complex*	No bacteria or yeast ****
21	Late acute PJI	Yes, PJI	*St. aureus*	*St. aureus*	*St. aureus* (3/5)	*St. aureus*	Gram-positive cocci in clusters
22	Late acute PJI	Yes, PJI	*St. aureus*	*St. aureus*	-	-	Gram-positive cocci in clusters
23	Acute native	Yes, SA	Negative *	*S. pyogenes (group A)*	*S. pyogenes (group A)* (1/1)	-	No bacteria or yeast
24	Acute native	No	Negative	Negative	-	-	Not performed
25	Acute native	No	Negative	Negative	-	-	No bacteria or yeast
26	Acute native	No	Negative	Negative	Negative	-	No bacteria or yeast
27	Acute native	No	Negative	Negative	Negative	-	No bacteria or yeast
28	Acute native	No	Negative	Negative	Negative	-	No bacteria or yeast
29	Acute native	No	Negative	Negative	Negative	-	No bacteria or yeast
30	Early acute PJI	No	Negative	Negative	Negative	Negative	No bacteria or yeast
31	Early acute PJI	Yes, PJI	Negative *	Negative	*Cu. avidum* (3/3) + *St. epidermidis* (1/3)	-	No bacteria or yeast
32	Early acute PJI	No	Negative	Negative	Negative	Negative	Not performed
33	Early acute PJI	Yes, PJI	Negative *	*E. cloacae complex* +*St. epidermidis*	*E. cloacae complex* (4/4) + *St. epidermidis* (3/4)	E. *cloacae complex*	No bacteria or yeast
34	Early acute PJI	Yes, PJI	Negative **	Negative	*St. epidermidis* (3/5) + *C. aurimucosum* (2/5) + *St. caprae* (1/5)	*St. epidermidis* + *St. haemolyticus*	No bacteria or yeast
35	Early acute PJI	No	Negative	Negative	Negative	Negative	No bacteria or yeast
36	Early acute PJI	Yes, PJI	Negative **	*St. epidermidis*	*St. epidermidis* (5/5)	*St. epidermidis*	No bacteria or yeast
37	Early acute PJI	Yes, PJI	Negative **	*St. capitis*	*St. capitis* (1/5)	*St. capitis*	No bacteria or yeast
38	Early acute PJI	No	Negative	Negative	Negative	Negative	No bacteria or yeast
39	Late acute PJI	No	Negative	Negative	Negative	-	No bacteria or yeast
40	Late acute PJI	No	Negative	Negative	-	-	No bacteria or yeast
41	Late acute PJI	No	Negative	Negative	-	-	No bacteria or yeast
42	Late acute PJI	Yes, PJI	Negative *	*S. mutans*	*S. mutans* (5/6)	-	No bacteria or yeast
43	Late acute PJI	No	Negative	Negative	Negative	-	No bacteria or yeast
44	Late acute PJI	Yes, PJI	Negative*	Negative	Negative	*S. lugdunensis*	No bacteria or yeast
45	Late acute PJI	Yes, PJI	Negative **, ***	*Ca. jejuni*	*Ca. jejuni* (6/6)	Negative	Gram negative rods

Table S2. Overview of BIOFIRE JI results, Infection Diagnosis, culturing results and Gram staining for all included patients (n=45) with a clinical suspicion of native septic arthritis, early acute PJI and late acute PJI. PJIs were diagnosed according to the 2013 MSIS criteria, septic arthritis according to a positive synovial fluid or tissue culture. * False negative in comparison to infection diagnosis and culturing while the species (marked yellow) is included in the BIOFIRE JI Panel. ** False negative in comparison to infection diagnosis and culturing, but species (marked in red) is not included in BIOFIRE JI Panel. *** False negative in comparison to Gram staining, but species (marked in red) is not included in BIOFIRE JI Panel. **** False negative Gram staining in comparison to BIOFIRE result.
C. = *Corynebacterium*; Ca. = *Campylobacter*; Cu. = *Cutibacterium*; E. = *Enterobacter*; En. = *Enterococcus*; Es. = *Escherichia*; H. = *Haemophilus*; PJI = prosthetic joint infection; SA = septic arthritis; St. = *Staphylococcus*; S. = *Streptococcus*.