Verification of Analytical Bacterial Spectrum of Novodiag Bacterial GE+ and QIAstat-Dx GI Panels in a Hospital Setting

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Novodiag

QIAstat

Target	Method(s) used for routine testing	Target included on multiplex panel	
		QIAstat	Novodiag
Campylobacter[b]	Culture	✓	✓
Salmonella[c]	Culture	✓	✓
Yersinia enterocolitica	Culture	✓	✓
Yersinia pseudotuberculosis	Culture		✓
Shigella spp.[d]	Culture, in-house PCR	✓	✓
STEC	Culture, in-house PCR	✓	✓
EIEC	Culture, in-house PCR	✓	✓
EPEC	Culture, in-house PCR	✓	✓
ETEC	Culture, in-house PCR	✓	✓
EAEC	Culture, in-house PCR	✓	✓
Clostridium difficile[e] **(tcdB)**	Real-time PCR (GeneXpert)	✓	✓
Plesiomonas shigelloides	Culture	✓	
Vibrio cholerae	Culture	✓	✓
Vibrio parahaemolyticus	Culture	✓	✓
Vibrio vulnificus	Culture	✓	

Organisms (no. samples)	Species (no. samples)	Material (no. samples)	QIAstat Detection rate	Novodiag Detection rate
Campylobacter[a] (n=21)	C. jejuni (18)	Clinical samples (15)	14/15	15/15
		EQA, QCMD (GastroB18S-01 and 02)	2/2	2/2
		ATCC 33560	1/1	1/1
	C. coli (2)	EQA, QCMD (GastroB18S-03)	1/1	1/1
		ATCC 33559	1/1	1/1
	C. upsaliensis (1)	CCUG 23626	1/1	NI
Salmonella[b] (n=23)		Clinical samples (16)	12/16[c]	10/16[c]
		EQA, QCMD (GastroB18S-02)	1/1	0/1
		Clinical strains (4)	4/4	4/4
		ATCC 13076 and ATCC 14028	2/2	2/2
Yersinia (n=16)	Y. enterocolitica (14)	Clinical samples (7)	7/7	6/7[d]
		EQA, QCMD (GastroB18S-08)	1/1	0/1 [d]
		Clinical strains (5)	5/5	2/5 [d]
		ATCC 23715	1/1	0/1 [d]
	Y. pseudotuberculosis (2)	Clinical samples (2)	NI	2/2
Shigella spp. (n=13)	S. sonnei (7)	Clinical samples (6)	6/6	6/6
		ATCC 25931	1/1	1/1
	S. flexneri (4)	Clinical samples (2)	2/2	2/2
		EQA, QCMD (GastroB18S-07)	1/1	1/1
		ATCC 12022	1/1	1/1
	S. boydii (1)	NCTC 9359	1/1	1/1
	S. dysenteriae (1)	Clinical sample	1/1	1/1

Vandbakterier

Organisms (no. samples)	Species	Material (no. samples)	QIAstat Detection rate	Novodiag Detection rate
Plesiomonas (n=3)	P. shigelloides	Clinical samples (1) EQA, QCMD (GastroB18S-06) ATCC 33560	1/1 1/1 1/1	NI
Vibrio (n=4)	V. parahaemolyticus V. vulnificus V. cholerae	Clinical strains (2) Clinical strains (2) NA	2/2 2/2	1/2 NI

Clostridiodes (Clostridium) difficile

Organism (no. samples)	Subtype (no. samples)	Material (no. samples)	QIAstat Detection rate	Novodiag Detection rate
Clostridioides difficile (n=24)	Toksin B (tcdB) (9)	Clinical samples (9)	9/9	8/9
	Toxin B (tcdB) plus binary toxin (cdtA/cdtB) (7)	Clinical samples (7)	7/7	3/7
	Toxin B (tcdB) plus binary toxin (cdtA/cdtB) and tcdCΔ117 (8)	Clinical samples (6)	5/6	3/6
		Clinical strains (1)	1/1	0/1
		EQA, QCMD (GastroB18S-04)	1/1	0/1

Organisms	Serotype	Targets	QIAstat	Novodiag
EAEC;ETEC;EAEC	NA	eae, eltA, AggR	EPEC, LTST, AGGR	EPEC (eae), ETEC, EAEC
EAEC	NA	eae (lt,st?)	(EPEC, LTST)	E. coli (eae)
ETEC	NA	estA	ETEC (LTST)	E. coli (ETEC)
EPEC	NA	eae	EPEC	E. coli (EPEC, eae)
STEC	O27:H30	stx2b	STEC (stx1/stx2)	EHEC stx2
EPEC	O111	eae	EPEC	E. coli (EPEC, eae)
EAEC	NA	AggR (eae?)	EPEC, AGGR	E. coli (EPEC, eae) missing aggR
STEC	O26:H11	eae,stx1a	STEC (stx1/stx2)	EHEC (eae, stx1)
EIEC	NA	ipaH	EIEC/Shigella	Shigella spp. / EIEC
STEC	O26:H11	stx2a (eae pos SSI)	STEC (stx1/stx2)	EHEC,eae stx2
ETEC, EAEC	NA	eltA, estA aggR	ETEC, EAEC (LTST, AGGR)	E. coli (ETEC, EAEC)
ETEC	NA	eltA, estA	ETEC (LTST)	E. coli (ETEC)
STEC	O26:H11	eae,stx1a	STEC (stx1/stx2)	E. coli (eae, stx1)
EIEC	O96:H19	ipaH	EIEC/Shigella	Shigella spp. / EIEC
STEC	O157:H7	eae,stx1a;stx2c	STEC (stx1/stx2, O157:H7)	E. coli EHEC (eae,stx1,stx2)
STEC	O26:H11	stx1a	STEC (stx1, stx2, 0157: H7)?	E. coli (eae, stx1)
STEC	O153, O178:H7!	stx1c (no eae primary)	STEC (stx1/stx2)	E. coli EHEC (eae,stx1,stx2)
STEC	O145:H-	stx2a	STEC (stx1/stx2)	E. coli (EHEC, eae,stx2)
STEC	O157:H7	eae,stx1a, stx2a	STEC (stx1/stx2, STEC (O157:H7)	EHEC (eae, stx1,stx2)
STEC	O154:H31	stx1d	STEC (stx1/stx2)	EHEC (stx1)
STEC with estAp	OX187:O28;	stx2g,estAp	ETEC (lt/st), STEC (stx1/stx2)	EHEC (stx2), ETEC
STEC	O8:H9	stx2a stx2d	STEC (stx1/stx2)	EHEC (stx2)
STEC	O63:H6	stx2f	STEC (stx1/STX2)	EHEC (eae,stx2)
STEC	O145:H34	stx2f	STEC (stx1/stx2)	EHEC (eae,stx2)
STEC	O156:H4	stx2d	STEC (stx1/stx2)	EHEC (stx2)
STEC with eltA	O166:H15	stx2d eltA	STEC (stx1/stx2) ETEC (lt/st)	EHEC (stx2), ETEC
STEC	O9:H9	stx2e	STEC (stx1/stx2)	Negative
ETEC	O6:H16	eltA, estAh	ETEC (lt/st)	ETEC
EPEC	O157:H NA	eae	EPEC	Negative

Conclusions		
	QIAstat	Novodiag
Hands-on-time	Short	Short
Turn-around-time	+++	+++
Amplification curves/ct value	yes	no
Reports	STEC	STEC subtype
	Camp. spp	C. species level
Technical failures	++	+
Multiplex, targets	B+V+P	B (+P)
Sensitivity, overall	+++	++
Salmonella	++	+
CD	+++	+
Yersinia	+++ inkl. 1A	+++
High throughput setting	1 module +	4 modules +
Versatility	Resp. panel (CNS panel)	CARBA panel
Price	+++	+