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Rapid identification of invasive fungal disease via a multi-channel qPCR melting curve analysis

06. Fungal infection & disease

6b. Diagnostic mycology (incl molecular)

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Background Quantitative polymerase chain reaction (qPCR) is a routinely used method for the detection and quantitation of gene expression in real time. Multiplex qPCR requires the use of probe-based assays, in which each probe is labeled with a unique fluorescent dye, resulting in different observed signals for each assay. The signal from each dye is used to detect each target separately in the same tube or well. The availability to multiplex therefore allows the measurement of the expression levels of several targets or genes of interest quickly. Based on the above principles, a series of kits including MycoMDx Aspergillus PCR Assay Kit, MycoMDx Mucorales PCR Assay Kit, MycoMDx Pneumocystis Jiroveci PCR AssayKit and MycoMDx Talaromyces marneffei PCR Assay Kit were developed. (Table 1).

Methods In the present study, we evaluated the clinical performance of the MycoMDx Aspergillus PCR Assay Kit, MycoMDx Mucorales PCR Assay Kit, MycoMDx Pneumocystis jiroveci PCR Assay Kit and MycoMDx Talaromyces marneffei PCR Assay Kit (CE-approved), which includes 153 clinical samples (Positive samples 78; Negative samples 75) shown in Table 2. The above PCR detection kits were developed and produced by Dynamiker Biotechnology (Tianjin) Co., Ltd.

Results The sensitivity and specificity of the MycoMDx Aspergillus PCR Assay Kit, MycoMDx Mucorales PCR Assay Kit, MycoMDx Pneumocystis jiroveci PCR Assay Kit and MycoMDx Talaromyces marneffei PCR Assay Kit were 92.0% and 97.1%, 91.7% and 100.0%, 90.5% and 97.7%, 95.0% and 97.1%, respectively (Table 2).

Conclusions The Aspergillus PCR Assay Kit, MycoMDx Mucorales PCR Assay Kit, MycoMDx Pneumocystis jiroveci PCR Assay Kit and MycoMDx Talaromyces marneffei PCR Assay Kit have a great clinical value.Especially, the Aspergillus PCR Assay Kit can fast and accurate identification of clinically relevant Aspergillus species (A. fumigatus , A. flavus, A. terreus and A. niger) directly in clinical sample (BALF, serum).

Table 1

Table 1 Development of four detection kits

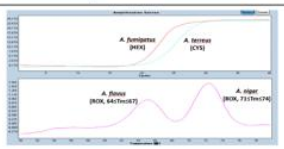
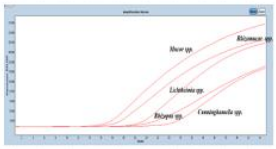
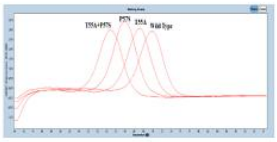
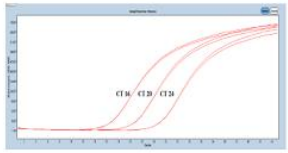
	PCR assay	Detecting target	Sample type	Kits	Amplification curve
1	MycoMDx *Aspergillus* PCR Assay	*Aspergillus fumigatus* *Aspergillus flavus* *Aspergillus niger* *Aspergillus terreus*	Serum、BALF		
2	MycoMDx *Mucorales* PCR Assay	*Rhizopus spp.* *Mucor spp.* *Lichtheimia spp.* *Cunninghamella spp.* *Rhizomucor spp.*	Biopsy, serum and BALF		
3	*MycoMDx Pneumocystis jiroveci* PCR Assay	*Pneumocystis jiroveci*	BALF		
4	*MycoMDx Talaromyces marneffei* PCR Assay	*Talaromyces marneffei*	Serum		

Table 2

Table 2 Diagnostic performance of the four detection kits in serum and BALF samples

	PCR assay	Proven/probable Positive samples (n)	Negative samples (n)	Sensitivity %	Specificity%
1	MycoMDx *Aspergillus* PCR Assay	25 Serum	34 Serum	92.0(23/25)	97.1(33/34)
2	MycoMDx *Mucorales* PCR Assay	12 BALF	41 BALF	91.7(11/12)	100.0 (41/41)
3	MycoMDx *Pneumocystis jiroveci* PCR Assay	21 BALF	41 BALF	90.5(19/21)	97.7(40/41)
4	MycoMDx *Talaromyces marneffei* PCR Assay	20 Serum	34 Serum	95.0(19/20)	97.1(33/34)

Keyword 1
probe-based qPCR
Keyword 2
melting curve analysis
Keyword 3
IFD

Conflicts of interest

Do you have any conflicts of interest to declare?
I have no potential conflict of interest to report