A quantative detection of septicemia-inducing pathogen based on capillary electrophoresis coupled with multiplex PCR

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Rapid diagnosis of septicemia-inducing pathogen has been considered as important criteria for a patient management and an appropriate therapy of septicemia in the early phase. Among several techniques, capillary electrophoresis-based single-strand conformation polymorphism (CE-SSCP) combined with 16S or 18S rRNA gene-specific PCR has come into the spotlight due to its benefits such as high sensitivity, resolution and great reproducibility. In this study, we developed a novel technique for quantitative pathogen diagnosis by CE-SSCP coupled with multiplex PCR. We introduced template-switching method for universal primer, which guarantee quantitative amplification of each DNA in multiplex PCR. Asymmetric PCR is applied for this study that maintain linear amplification phase longer. Consequently, we developed a one-step CE-SSCP diagnosis method; perform detection and quantification at same time. As a model system, 12 species of septicemia-inducing pathogen were identified and quantified simultaneously. The results illustrated the potentials of this method on pathogen diagnosis and high-throughput drug discovery.