Clinically important pathogen detection by microarray validated with various clinical isolates

유승민, 장경희[1], 유내춘[2], 금기창[3], 유원민[4], 김준명[1], 이상엽*

KAIST 생명화학공학과; [1]연세대학교 의과대학 감염내과; [2]연세대학교 의과대학 암연구센터; [3]연세대학교 의과대학 방사선종양학과; [4]연세대학교 의과대학 성형외과

(leesy@kaist.ac.kr*)

A rapid and precise diagnosis of bacterial infection is important for proper therapy to patients. However, bacterial detection by the traditional method containing cultivation is time consuming and not sensitive enough. DNA microarray-based assay provides more reliable, efficient, reproducible, precise and high throughput detection in a short assay time than current techniques. In this study, we suggest diagnostic microarray for 39 pathogenic bacteria, which selected based on high prevalence and/or difficulty of cultivation. Based on the 23S ribosomal DNA (rDNA) and 16S-23S rDNA intergenic spacer region sequence analysis, the bacteria- and bacterial species-specific probes were designed by considering relations between the probe properties and hybridization efficiency. The probes were microarrayed on the slide glass and the usefulness of these selected probes was confirmed by hybridizing with DNAs from reference bacteria and 515 clinical isolates. Our diagnostic microarray for pathogen showed 97.7% sensitivity, 100% specificity and positive predictive value.