

### Pathogenic Bacteria Detection using 16S rDNA-Based DNA Chip

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Pathogen detection is an important issue due to the threats posed by severe communicable diseases. Here, to achieve multiple detection of 11 selected pathogens, we constructed a 16S rDNA chip. Although 7 target pathogens were specifically detected using PCR labeling method, some target species or subtypes were difficult to discriminate due to nonspecific binding. Therefore, a pattern-mapping statistical model was established using an artificial neural network algorithm. The pattern-mapping tool combined with the DNA chip resulted in successful detection of all target pathogens. In addition, to reduce the intrinsic bias and extended time and effort induced by PCR or labeling reaction, we suggested direct detection method using 16S rRNA as target. The bacterial total RNAs from cell lysate were hybridized to constructed 16S rDNA-based chip and detected using 7 fluorescent-labeled detector probes. The direct detection combined with the DNA chip resulted in more specific detection of all target pathogens than that of PCR labeling method. Collectively, our novel pattern-mapping tool and 16S rRNA direct detection combined with a 16S rDNA-based chip are a simple and effective method for detecting multiple pathogens.