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A semi-quantitative method for point-of-care assessments of specific pathogenic bioaerosols using a portable microfluidics-based device

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## ABSTRACT

Here we presented a novel point-of-care detection method for semi-quantitative assessments of specific pathogenic bioaerosols based on the portable microfluidics-based device. Sample enrichment, DNA amplification, and detection were performed sequentially on the device with simple procedures, perfect for on-site application. The methods for the assessments of four pathogenic bioaerosol biomarkers, including *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Acinetobacter baumannii*, were respectively established that inclusive of the selections of specific primers, optimizations of on-chip DNA extractions, and the establishments of semi-quantitative curves. Then the methods were verified by the assessments of generated mimic bioaerosols. The results demonstrated that pathogen quantities could be estimated by using the method to reflect airborne dissemination. The presented method could provide valuable data for the forecasting pathogen spreading risks in high

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