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Rapid detection of aerosolized *Bacillus* spore particles by direct *in situ* analysis of MALDI-TOF mass spectrometry

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Accurate and rapid analytical methods are essential for the detection and identification of biological warfare agents (BWA) as well as pathogens. Although various studies have investigated the uses of a matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry (MS) for bacterial classification, only a few studies have examined the applicability of method for the identification of BWAs. This study aimed to generate, collect and analyze *Bacillus* spore aerosol particles of 2-10 μm , the optimal size of a BWA. In this process, we developed an apparatus to directly deposit *B. globigii* aerosols on MALDI target plate wells for rapid MALDI-TOF analysis. *Bacillus* spore aerosol particles of 2-10 μm were rapidly analyzed using direct *in situ* MALDI-TOF MS without any pretreatment processes. The mass spectra of aerosolized *Bacillus* spore particles were successfully detected. For real-time detection and identification, a mass spectral database of *Bacillus* spores was constructed, and an algorithm was developed and applied. *Bacillus* spore particles were rapidly detected and identified by MS, which can be used for the detection and inspection of BWAs such as *B. anthracis* spore in the battle field.

Biography

Young-Su Jeong has completed his PhD from Korea Advanced Institute for Science and Technology (KAIST) in 2012. He is a Senior Researcher of Agency for Defense Development (ADD), ROK. He has published more than 18 papers in reputed journals.

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