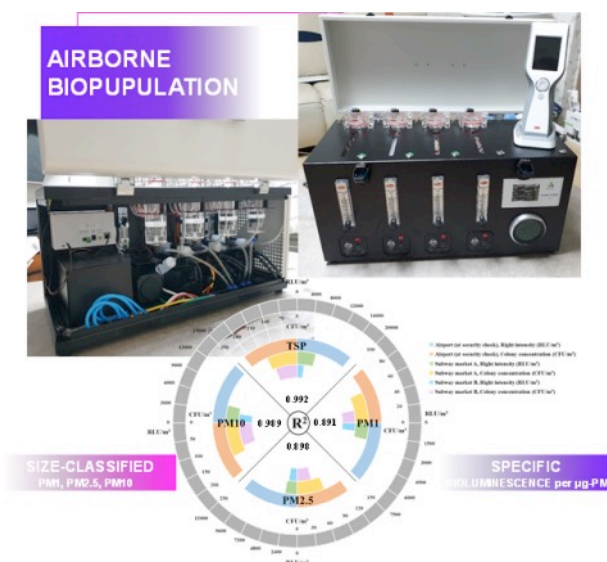


Size-Classified Bioaerosol Detection from Recombination of Technically Proven Components

Jeong Hoon Byeon, Jaeho Oh

School of Mechanical Engineering, Yeungnam University, Gyeongsan 38541, Republic of Korea
postjb@yu.ac.kr

From the perspective of re-creating detection strategies using existing principles and devices, the detection of airborne adenosine triphosphate (ATP) bioluminescence has often been proposed to represent a biological population in the air as an alternative because of fast response speed with a high resolution and correspondence to the culture-based bioaerosol monitoring. Nevertheless, there is a need to improve in instrumental and data processing techniques to offer more informative results for general applications, even by non-experts with hand-held devices.



This study attempted to recombine technically proven devices (ATP luminometer and airborne particulate matter (PM) monitor) and components (inertial impactor and ultrasonic humidifier) to generate size-classified (biological populations for different PM sizes) and specific (biological fraction per unit mass of PM) bioluminescence without a technical delay. Through this recombination, it was possible to provide which size of airborne PMs has physical dominance and intensity, thereby providing meaningful information for proper intervention measures within minutes.

- [1] J. Oh, J. Choi, M. Massoudifarid, J. Y. Park, J. Hwang, J. Lim, J. H. Byeon, *Biosens. Bioelectron.*, **2023**, 234, 115356.