

Nanoparticle profiling: a comprehensive assessment of physical, chemical, and toxicological characteristics at Thessaloniki airport

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Despite the growing attention towards ground-level aircraft emissions and air pollution near airports, numerous research gaps persist [1]. This study focuses on air quality measurements conducted in proximity to runways during take-offs and landings at Thessaloniki Airport, emphasizing particle characteristics in both summer and winter seasons. Employing various instruments, we evaluated particle mass, number, size distribution, and nanoparticle concentration in the air. Chemical analysis, including examination of volatile organic compounds and metal components, was carried out to provide a more thorough understanding of the particulate matter composition. Background measurements served as a reference for comprehensive results. In parallel, Air-Liquid Interface (ALI) tests with human lung cells were performed, shedding light on the toxicological effects of the measured particles on the respiratory system. The results indicate a decrease in cell viability and an increase in cytokine release, contributing valuable information to the assessment of air quality near active runways. This study enhances our comprehension of particle pollution in airport environments, with potential implications for environmental management and regulatory considerations.

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[1] Bendtsen, K.M., Elizabeth Bengtsen, Anne T Saber, Ulla Vogel, **2021**. Environmental Health, 20, 10.