

REVIEW

Atmospheric Pollution and the Impact on the Respiratory Tract and Lungs

Cristina Roxana POPA¹, Gheorghe TOMOAI^{2,3}, Gertrud Alexandra PALTINEAN¹,
Aurora MOCANU¹, Ileana COJOCARU¹, Maria TOMOAI-COTISEL^{1,3*}

¹Babes-Bolyai University of Cluj-Napoca, Faculty of Chemistry and Chemical Engineering,
Research Centre of Physical Chemistry, 11 Arany Janos Str., RO-400028, Cluj-Napoca,
Romania

²Iuliu Hatieganu University of Medicine and Pharmacy, Department of Orthopedic Surgery, 47
General Traian Mosoiu Str., Ro-400132, Cluj-Napoca, Romania

³Academy of Romanian Scientist, 3 Ilfov, RO-050044, Bucharest, Romania

* Corresponding author e-mail: *Maria Tomoia-Cotisel*, mcotisel@gmail.com
maria.tomoiaia@ubbcluj.ro

DOI <https://doi.org/10.56082/annalsarscibio.2021.1.60>

Abstract

The rapid development of the infrastructure of metropolises, cities, population and industry has led to severe air pollution, which has serious consequences for public health and the environment. Distortion of environmental quality includes a wide range of particulate matter (PM) and nanoparticles (NPs) that may contain in their structure and on their surface toxic substances, nasopharyngeal secretions, heavy metals, manure, pollen, bacteria, viruses, cigarette ash, SO_x, NO_x, O₃. Studies in the literature on epidemiology and toxicology show the association between air pollution and its negative impact on the respiratory tract and lungs. This review highlights the pathways of PM and NPs (nasal, buccal and skin pores) and also the mechanisms by which their negative effects are strictly related to the complex properties and very small size of particles. Exposure to PM and NPs in both the short and long term can lead to clinical, chronic and even incurable diseases causing even death. This review addresses a topical issue that may influence both the understanding of the negative impact of air pollution and the improvement of protection strategies for dealing with an ecological disaster.

Keywords: Atmospheric pollution, PM, nanoparticles, respiratory tract, pulmonary diseases