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In vivo imaging of ICAM-1 targeted nanoparticles in XPC mice and wild mice exposed to ambient air pollution in São Paulo, Brazil

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Atmospheric pollution is an environmental risk factor in large urban centers. São Paulo Metropolitan Area (SPMA), located in the southeast of Brazil, has a population of nearly 20 million people and 8 million vehicles. It is long known that exposure to air pollutants can cause various health effects such as increased inflammatory response and DNA damage. One of the most versatile defense mechanisms against the accumulation of DNA damage is the nucleotide excision repair (NER), which includes the XPC protein. Different studies have shown that knockout mice in the XPC gene have an increased occurrence of lung tumors. However, the effects of DNA damage caused by air pollutants regarding the lung inflammatory response are largely unknown. In this study, we injected intravenously Intercellular Adhesion Molecule-1 (ICAM-1) targeted nanoparticles (anti-ICAM-1) and evaluated the response using IVIS spectrum. Mice were exposed to an accumulated dose (concentration vs time of exposure in hours) of 600 μg.m-3 during 1 hour, which corresponds to an average concentration of 25 μg.m-3 in 24 hours. The next day after exposure, we observed a significantly stronger fluorescent marker for anti-ICAM in the polluted group than the filtered air group. Furthermore, among the animals exposed to ambient pollution, XPC mice have shown a stronger inflammatory response relative to wild mice. The expression of pro-inflammatory cytokines in the lungs is currently being evaluated. These data demonstrate that exposure to ambient air pollution in São Paulo promotes the acute inflammatory responses in mice, especially in knockout mice in the XPC gene.

Biography

Nilmara de Oliveira Alves is a Post-doctoral Fellow in the School of Medicine of the University of São Paulo. The researcher, who recently received her Doctoral title, focuses on atmospheric pollutants and especially on their effects on health using both *in vitro* and *in vivo* tests. For that end, she conducts interdisciplinary projects comprising genotoxicity, DNA repair, pathology and atmospheric chemistry.

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