

In Vitro Assessment of Cytotoxic Effects of Particulate Matter on Isolated Splenocytes and Respiratory Cells

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Background: Environmental air pollution, driven largely by particulate matter (PM), is a significant global health concern. PM_{2.5} can penetrate the respiratory tract, leading to inflammation and oxidative stress.^{1,2} Beyond its impact on the lungs, PM exposure may also disrupt immune functions by affecting organs such as the spleen.³ Given the spleen's critical role in immune regulation, it is essential to understand how PM_{2.5} exposure influences both respiratory and immune health, particularly in regions with high levels of air pollution.⁴

Aims: This study aims to evaluate the cytotoxic effects of PM_{2.5} on splenocytes and respiratory cells, using samples collected from two cities in Kosovo: Prishtina and Obiliq. We investigated how different concentrations of PM_{2.5} affect cellular responses, focusing on the relationship between dose, exposure duration, and cell viability.

Methods: Splenocytes and respiratory cells were isolated from the spleens and lungs of mice, respectively. Cells were exposed to culture media containing four concentrations of PM_{2.5} (25, 50, 70, and 100 µg/ml) for 24 hours. Cellular viability was measured using MTT assays to assess metabolic activity.

Results: Both splenocytes and respiratory cells showed a concentration-dependent decline in metabolic activity after 24, 48 and 72 hours of PM_{2.5} exposure.

Conclusion: This study underscores the toxic effects of PM_{2.5} on both splenocyte and respiratory cell function, providing critical insights into the broader implications of air pollution on human health, particularly its potential to impair both respiratory and immune system function.

References

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