

Evaluation of the Cytotoxicity and Genotoxicity of Chemical Material in Filters PM2.5 of the Monitoring Stations of the Network of Air Quality in the Valle De Aburrá, Colombia

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Abstract : Adverse effects and increased air pollution has raised concerns about regulatory policies and has fostered the development of new air quality standards; this is due to the complexity of the composition and the poorly understood reactions in the atmospheric environment. Toxic compounds act as environmental agents having various effects, from irritation to death of cells and tissues. A toxic agent is defined an adverse response in a biological system. There is a particular class that produces some kind of alteration in the genetic material or associated components, so they are recognized as genotoxic agents. Within cells, they interact directly or indirectly with DNA, causing mutations or interfere with some enzymatic repair processes or in the genesis or polymerization of proteinaceous material involved in chromosome segregation. An air pollutant may cause or contribute to increased mortality or serious illness and even pose a potential danger to human health. The aim of this study was to evaluate the effect on the viability and the genotoxic potential on the cell lines CHO-K1 and Jurkat and peripheral blood of particulate matter PM T lymphocytes 2.5 obtained from filters collected three monitoring stations network air quality Aburrá Valley. Tests, reduction of MTT, trypan blue, NRU, comet assay, sister chromatid exchange (SCE) and chromosomal aberrations allowed evidence reduction in cell viability in cell lines CHO-K1 and Jurkat and damage to the DNA from cell line CHOK1, however, no significant effects were observed in the number of SCEs and chromosomal aberrations. The results suggest that PM2.5 material has genotoxic potential and can induce cancer development, as has been suggested in other studies.

Keywords : PM2.5, cell line Jurkat, cell line CHO-K1, cytotoxicity, genotoxicity

Conference Title : ICEPRM 2016 : International Conference on Environmental Pollution, Restoration and Management

Conference Location : Barcelona, Spain

Conference Dates : August 11-12, 2016