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Effect of Long-Term Exposure of Car Fumes on Global DNA Methylation Among Greater Cairo Traffic Workers in Egypt

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ABSTRACT

Air pollution is one of the most crucial public health concerns over the globe. Car fumes as a major component of the pollution burden is thought to modulate the methylation landscape of the exposed people. to assess the DNA methylation pattern changes and assess TGF-β gene expression after long term exposure to car fumes among traffic workers. In the present study, 199 blood samples were collected from male traffic workers as a cohort population belonging to the Traffic Department, Ministry of Interior in Egypt. Global DNA methylation was quantified using real time PCR-based technology.

Also, tumor growth factor gene expression was assessed using real time PCR as an indicator for the transformation of cells from the normal to the malignant state. Results of the current study indicated a hypermethylation in the outdoor group compared to the indoor group. Also, the level of TGF-β expression and blood glucose levels were elevated among outdoor group as compared indoor group. Furthermore, there was a positive relation between working outdoor and blood glucose levels (mg/dL) as the diabetic

participants which were presented only in the outdoor group. Our study recommends reducing working hours for traffic police class exposed to car exhaust to prevent the risks of developing tumors in traffic workers in Egypt, especially whom spend more than 10 years working outdoors.

Keywords: Air pollution, Car Fumes, Epigenetics, Methylation, TGF-β