PRIMEQUAL
Programme de recherche interorganisme
pour une meilleure qualité de l'air

GENOTOX'ER
Distribution de l'exposition de la population urbaine a des polluants particulaires génotoxiques, et évaluation du risque cancérogène

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The Genotox'ER project was conducted in 4 metropolitan areas (Grenoble, Paris, Rouen and Strasbourg), among 60 to 90 adults and children per site. It characterized exposure of volunteers to metals and organic compounds attached to $PM_{2.5}$ or PM_{10}, and to benzene, according to different urban environments (industrial sectors, areas influenced by traffic emissions, "urban background"). The genotoxicity of the particles' organic extracts was analysed (comet test). Results : The exposure levels are very variable according to the city, the urban sector, the season, for children and for adults altogether. The black smoke index is more closely related to traffic intensity than the particles' mass. To date, no unique key to convert ambient air concentrations into population exposure levels exists, that would hold true across cities, urban sectors, seasons and pollutants. The genotoxic response is greater in areas influenced by traffic, and more so in winter. Based on the hypothesis that long term exposures are correctly indexed by the PM2.5 exposures measured during the study, and by reference with a « no effect » 4.5 $\mu g/m^3$ level, the yearly average number of lung cancer cases attributable to fine particles spans between 16 and 404 according to the city.