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[Subway Air Triggers Cancer](#)

Iron rich particles from subways' air are very toxic

Urban environments are full of airborne particles, harmful to varying degrees when inhaled. But a subway ride can be particularly risky for your health. Swedish researchers from Karolinska Institutet found the particles from the underground system in Stockholm damaging to our cellular DNA. "Luckily, most of them do not remain in the underground for any length of time," says scientist Hanna Karlsson. "However, particle levels are often very high. My results show that there is every reason to speed up the work being done to clean the air in the underground." Some 5,300 Swedes are thought to die prematurely annually from inhaling the microscopic particles of coal, asphalt, iron and other materials that pollute the urban atmosphere. The contaminant particles result from incomplete combustion, road surface attrition, and other human activities and could be reduced with proper environmental laws. The new research assessed which particle sources represent the greatest threat to human health. That's why Dr Karlsson has compared how particles with different origins attack cultured lung cells. The particles in the underground system were mostly iron-containing and emerge from the abrasion of the train wheels against the rails. These particles form free radicals when enter the cells. Free radicals are highly active molecules that can damage DNA structure and sometimes overpass the organism's recovering ability, triggering cancer. The research also investigated the particles caused by the friction between car tyres and the road surface, finding them responsible for a powerful inflammatory response (i.e. a general defense reaction in the body). The highest levels of these particles are found in the atmosphere during the spring, when road surfaces dry out and cars are still fitted with studded winter tyres. "It's a serious problem, as these particles exist in large concentrations in environments that people remain in for long periods," says Dr Karlsson. Particles resulted from the combustion of wood, pellets and diesel, also proved to have some degrees of toxicity. Modern burning boilers gave off much fewer emissions than old types, but the particles produced were by no mean less harmful.