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## RESEARCH SUMMARY

### Health Effects of Emissions

#### Diesel Exhaust and Cancer Development

Scientists at Ohio State University say they have demonstrated that the link between exposure to diesel exhaust particles and cancer lies in the ability of diesel exhaust to induce the growth of new blood vessels.

**Source:** Xiaohua Xu et al, Diesel exhaust exposure induces angiogenesis; *Toxicology Letters*, [doi:10.1016/j.toxlet.2009.08.006](https://doi.org/10.1016/j.toxlet.2009.08.006).

#### The Role of Ultrafine Particles in Atherosclerosis

The authors of this study found that ultrafine particles (<0.18 µm) enhance early atherosclerosis, partly due to their involvement in the promotion of tissue oxidative stress. Exposure to ultrafine particles also results in alterations of an anti-inflammatory function.

**Source:** Araujo and Nel; Particulate matter and atherosclerosis: role of particle size, composition and oxidative stress; *Particle and Fibre Toxicology* 2009, 6:24, [doi:10.1186/1743-8977-6-24](https://doi.org/10.1186/1743-8977-6-24).

#### Ultrafine Particles and Lung Deposition of PAHs

A paper from Saitama University indicates that ultrafine particles are significant contributors to the deposition of PAHs into the lung alveolar region.

**Source:** Kawanaka et al., Size distributions of polycyclic aromatic hydrocarbons in the atmosphere and estimation of the contribution of ultrafine particles to their lung deposition; *Environmental Science & Technology* 43 (17) 6851-6856, [doi: 10.1021/es900033u](https://doi.org/10.1021/es900033u)

#### Effects of Air Pollution on the Elderly

A study from Korea investigates the short-term association between air pollution and mortality and estimates the health benefits of attaining the World Health Organization's (WHO) air quality guidelines.

**Source:** Hyun Joo Bae and Jeongim Park, Health benefits of improving air quality in the rapidly aging Korean society, *Science of the Total Environment*, [doi: 10.1016/j.scitotenv.2009.08.022](https://doi.org/10.1016/j.scitotenv.2009.08.022).

#### Effect on Cognitive Function of Particulate Exposure

A study from Germany investigating the association between exposure to fine particulate and mild cognitive impairment (MCI) which is associated with a high risk of progression to Alzheimer's disease, found a dose-response relation.

**Source:** Ranft et al., Long-term exposure to traffic-related particulate matter impairs cognitive function in the elderly; *Environmental Research*, [doi: 10.1016/j.envres.2009.08.003](https://doi.org/10.1016/j.envres.2009.08.003).

#### Air Pollution and Chronic Pulmonary Disease

This paper reports an investigation of the association between short-term changes in blood markers of inflammation and coagulation for patients with chronic pulmonary disease and daily changes in air pollution.

**Source:** Hildebrandt et al, Short-term effects of air pollution: a panel study of blood markers in patients with chronic pulmonary disease, *Particle and Fibre Toxicology*, 2009, 6:25, [doi: 10.1186/1743-8977-6-25](https://doi.org/10.1186/1743-8977-6-25).

#### Effect of Particulate Matter in Lung Cells

This paper investigates if exposure to diesel exhaust particles can affect three cell types that play a key role in maintaining epithelial integrity following exposure to particulate antigens in lung cells.

**Source:** Lehmann et al, Diesel exhaust particles modulate the tight junction protein occludin in lung cells in vitro; *Particle and Fibre Toxicology* 2009, 6:26, [doi:10.1186/1743-8977-6-26](https://doi.org/10.1186/1743-8977-6-26).

#### Air Pollution and Rheumatoid Arthritis

According to this study, people who live close to major roads may have a greater risk of developing rheumatoid arthritis. The researchers suggest that inhaled particulate matter can cause inflammation in the lungs leading to a general inflammatory response.

**Source:** Hart, et al. Exposure to Traffic Pollution and Increased Risk of Rheumatoid Arthritis. *Environmental Health Perspectives* 117(7):1065-1069.

#### No link between Black Smoke and Stillbirth Risk

A new paper analyses health and environmental data to examine the potential for an association between black smoke air pollution and stillbirth risk. No association was found.

**Source:** Pearce et al, No association between ambient particulate matter exposure during pregnancy and stillbirth risk in the north of England, 1962-1992; *Environmental Research*, [doi: 10.1016/j.envres.2009.10.003](https://doi.org/10.1016/j.envres.2009.10.003).

#### Link between Air Pollution and Migraine

A study from Santiago province, Chile, has found increased hospital admissions for migraines and other headaches on days of elevated air pollution.

**Source:** Dales, Cakmak and Vidal, Air Pollution and Hospitalization for Headache in Chile; *American Journal of Epidemiology*, 2009 170(8), 1057-1066, [doi:10.1093/aje/kwp217](https://doi.org/10.1093/aje/kwp217).

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