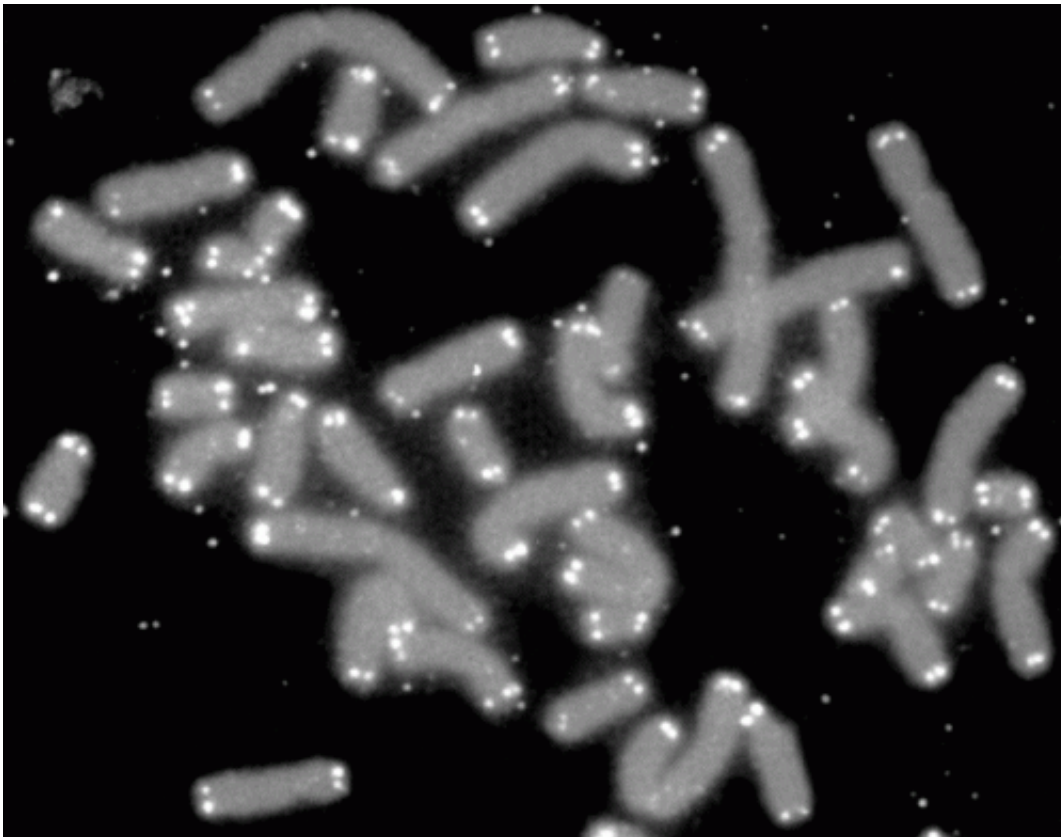


Study shows telomere shortening in youth with higher pollution exposure

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Human chromosomes (grey) capped by telomeres (white). Credit: PD-NASA; PD-USGOV-NASA

Children and teens exposed to high levels of traffic-related air pollution have evidence of a specific type of DNA damage called telomere shortening, reports a study in the May *Journal of Occupational and*

Environmental Medicine.

Young people with asthma also have evidence of telomere shortening, according to the preliminary research by John R. Balmes, MD, of University of California, Berkeley, and colleagues. They write, "Our results suggest that telomere length may have potential for use as a biomarker of DNA damage due to environmental exposures and/or chronic inflammation."

The study included 14 children and adolescents living in Fresno, Calif.—the second-most polluted city in the United States. The researchers assessed the relationship between [polycyclic aromatic hydrocarbons](#) (PAHs), a "ubiquitous" air pollutant caused by [motor vehicle exhaust](#); and shortening of telomeres, a type of DNA damage typically associated with aging.

As the exposure to PAHs increased, telomere length decreased in linear fashion. Children and teens with asthma were exposed to higher PAH levels than those without asthma. The relationship between PAH level and telomere shortening remained significant after adjustment for asthma and other factors (age, sex, and race/ethnicity) related to [telomere length](#).

The study adds to previous evidence that air pollution causes oxidative stress, which can damage lipids, proteins, and DNA. Research has suggested that children may have different telomere shortening regulation than adults, which might make them more vulnerable to the damaging effects of air pollution.

"Greater knowledge of the impact of air pollution at the molecular level is necessary to design effective interventions and policies," Dr. Balmes and coauthors conclude. With further research, telomeres could provide a new biomarker to reflect the cellular-level effects of exposure to [air](#)

[pollution](#). Telomeres might also provide new insights into the understanding how pollution exposure leads to adverse health outcomes.

More information: Traffic-Related Air Pollution and Telomere Length in Children and Adolescents Living in Fresno, CA: A Pilot Study. [DOI: 10.1097/JOM.0000000000000996](https://doi.org/10.1097/JOM.0000000000000996)

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