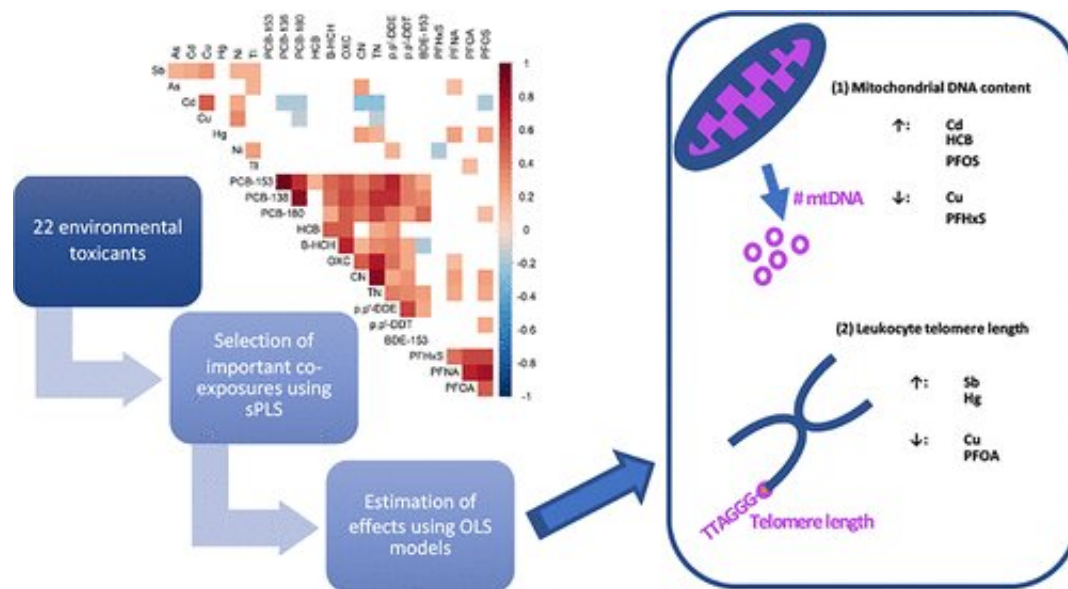


Environmental pollutants could impact cellular signs of aging

May 1 2019



Credit: American Chemical Society

Researchers have linked some environmental pollutants with diseases, a decreased life span and signs of premature aging, such as wrinkles and age spots. But can accelerated aging be detected at the cellular level in healthy people exposed to pollutants? Now, researchers in the ACS journal *Environmental Science & Technology* report that although pollutant exposure can affect two hallmarks of aging in people (mitochondrial DNA content and telomere length), the results are not so clear-cut.

Some [environmental pollutants](#) cause mitochondria—the cell's powerhouses—to release more reactive oxygen species, which can damage the DNA —in these organelles and lead to inflammation. Telomeres, the DNA-protein caps on the ends of chromosomes that allow them to continue dividing, are also sensitive to environmental stress. Shorter telomeres are a hallmark of aging, whereas abnormally long telomeres are often seen in cancer cells. Michelle Plusquin of Hasselt University and colleagues wondered if individual pollutants, or combinations of them, could affect mitochondrial DNA content or [telomere length](#) in people.

To find out, the researchers analyzed various pollutants in blood and urine samples from 175 adults (50 to 65 years old) enrolled in the Flemish Environment and Health Study. The team determined mitochondrial DNA content and telomere length from the participants' blood cells. The researchers used multipollutant models to study all pollutants simultaneously, a novel approach in environmental sciences. They found that people with higher levels of urinary copper and serum perfluorohexane sulfonic acid had decreased mitochondrial DNA content, while higher urinary copper and serum perfluorooctanoic acid levels were linked with shorter telomeres. But some pollutants were associated with either higher mitochondrial DNA content or longer telomeres.

These findings suggest that pollutants could impact molecular hallmarks of aging, though more research is needed to determine the mechanism and biological effects, the researchers say.

More information: Annette Vriens et al. Exposure to Environmental Pollutants and Their Association with Biomarkers of Aging: A Multipollutant Approach, *Environmental Science & Technology* (2019). [DOI: 10.1021/acs.est.8b07141](https://doi.org/10.1021/acs.est.8b07141)

Provided by American Chemical Society

Citation: Environmental pollutants could impact cellular signs of aging (2019, May 1) retrieved 20 April 2024 from

<https://phys.org/news/2019-05-environmental-pollutants-impact-cellular-aging.html>

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